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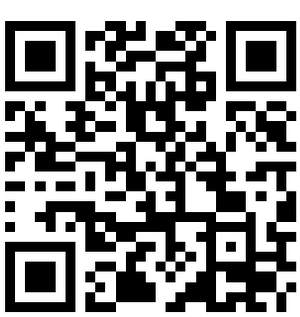

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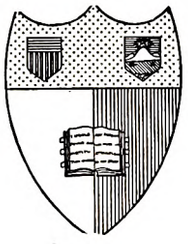

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Electric Railway Journal

Volume 65

January to June 1925

McGraw-Hill Company, Inc.
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How to Use the Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each of them. In addition, a geographical reference is published wherever the article relates to any particular railway company, city, state or nation. Entries about electric railway companies are under the name of the city in which the main office of the company is located, but in the case of electrified sections of steam railroads, the entries appear under the name of the railroad.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the common keywords used in the index to this volume. This list has been subdivided for convenience into fourteen general subjects.

The headings which appear in the index are those in small type under the general classifications. The main headings printed in capitals below do not appear in the index. The list of keywords is revised from time to time to keep the index abreast with developments.

As an example of how to use the index, if a reader wishes to locate an article on special trackwork he obviously would look in the list below at the general subject "Track." Under this caption, only "Special trackwork" could apply to the article in question. The reader would therefore refer to this keyword under the S in the body of the index.

In addition to the groups of articles covered by these headings the papers and reports from railway associations are grouped under the names of the various organizations. Proceedings of other associations and societies are indexed in general only in accordance with the subject discussed. Short descriptions of machine tools appear only under the heading "Repair shop practice; shop methods and equipment" and are not indexed alphabetically, because there is a wide choice in most cases of the proper keyword to be used.

All signed articles also are indexed by the name of the author. When the name of the author is known this provides the simplest method of locating any article.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND ACCIDENT PREVENTION

Accident claim department
Accidents (including wrecks)
Medical
Safety work
Storm and fire damage

ELECTRIC CARS AND SERVICE CARS

Cars (including car design)
Locomotives
Service and tower trucks
Trackless trolley

CAR EQUIPMENT

Bearings
Brakes and compressors
Current collection
Doors, car
Electrical equipment for cars (except motors)
Gears and pinions
Heaters, electric
Lighting and lighting fixtures
Motors, Electric
Resistors
Seats
Trolley wheels
Trucks
Wheels and axles

EMPLOYEES

Education
Employees
Labor
Medical
Strikes and arbitrations
Wage decreases
Wage increases
Wages and working agreements

FARES

Fare collection (including apparatus)
Fare decreases
Fare increases
Fares
Traffic investigations
Traffic stimulation

FINANCIAL, LEGAL AND STATISTICS

Accounting
Appraisal of railway property
Blanks and forms
Discontinuance of lines
Financial (methods of financing)
Franchises
Insurance, Fire
Insurance and pensions
Legal
Legislation for railways
Market conditions
Operating records and costs
Public service and regulative commissions
Statistics
Taxes

HEAVY ELECTRIC TRACTION

Heavy electric traction (general)
Locomotives

MAINTENANCE OF EQUIPMENT

Car cleaning
Lubrication
Maintenance practice
Motor buses, Practice with
Painting
Repair shop practice; cars and car equipment
Repair shop practice; shop methods and equipment
Repair shops and equipment
Stores
Tests of materials and equipment
Welding

MOTOR BUSES

Motor buses, design
Motor buses, field for
Motor buses, installations
Motor buses, jitney competition
Motor buses, practice with
Motor buses, regulation

POWER

Energy checking devices
Energy consumption
Fuels
Overhead contact system
Power distribution

POWER—Continued

Power generation
Power stations and equipment
Power transmission
Substations and equipment

STRUCTURES

Carhouses and storage yards
Power stations and equipment
Repair shops and equipment
Substations and equipment
Terminals and waiting stations

TRACK

Pavements
Poles
Rail joints and bonds
Rails
Special trackwork
Ties
Track construction
Track maintenance

TRAFFIC AND TRANSPORTATION

Advertising
Customer ownership
Dispatching
Freight and express
Interurban railways
Merchandising transportation
Publicity
Public, Relations with
Rapid transit (elevated and subway)
Schedules and timetables
Signals
Street traffic congestion
Traffic investigations
Traffic regulation
Traffic stimulation
Transportation, Metropolitan (general studies)

MISCELLANEOUS

European practice
Management
Noise reduction
Railways (general)
Snow and ice removal
Standardization
Wood preservation

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New York, January 3, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by McGraw-Hill Company, Inc.
HARRY L. BROWN, *Editor*

Volume 65
Number 1

Electric Railways Are Forging Ahead

ELECTRIC railways of the United States and Canada purchased 4,092 new cars and locomotives during the year 1924. This is more than in any year since 1913. They also increased their facilities for handling the public by purchase of 963 new motor buses. They junked 1,853 old cars—more than in any year of which this paper has record. They built 312 miles of track extensions, which is the most in any year since 1918. They reconstructed 764 miles, exceeded only by the high figure of 1923, namely 854 miles. The total of track built and rebuilt and new electrification amounts to 1,160 miles—greater than in any year since 1915.

During the year 1924 the electric street and interurban railways of the United States expended $262,700,000 in the purchase of materials, supplies and equipment for new plant and for maintenance purposes. In 1925 they plan to spend for the same items $342,000,000. This is more than in any recent year and it gives the prospect of increasing activity along the line of improvements and expansions during the new year. In other words, the program of modernization is to go forward with even greater intensity.

During the year just past more new financing for electric railways was done than in any recent year. The total of items exceeding $200,000 was $85,085,000, which was over four times the amount sold in 1923. And this was done on better terms than heretofore. Much greater use was made of the car trust plan in financing purchases of new rolling stock. A new feature of the year's financing was the employment of the passenger partnership or customer ownership method to the extent of $9,750,000 by 10 strictly electric railway properties. Maturities of large bonded obligations during 1925 will amount to $28,224,000, which is only about one-third of the similar obligations that had to be met in 1924.

The number of new receiverships during the year was 12, the same as last year. Companies coming out of receivership numbered 18. The total capital involved in all roads remaining in receivership at the end of 1924 is $117,000,000 less than the total at the end of 1923, and the mileage is 338 less.

The use of buses by electric railways is rapidly extending. The number of companies operating buses increased during 1924 from 121 to 156. The number of buses owned increased from 1,207 to 2,462. Further large additions to the bus equipment of the electric railways is known to be imminent.

In a few words, then, this is the picture of the progress of the industry during 1924 as shown by the statistics compiled by the JOURNAL editors and presented in this number. It is indeed impressive. Far from going backwards, the industry is forging ahead. It is improving its condition in every respect. It is getting rid of old cars and putting new ones in service to secure more economical operation and make the service more attractive. It is supplementing the rail service with bus lines. The fear of buses has given way to a pretty definite idea of where and how to capitalize upon this new transportation tool. Public relations are much improved. Fares are adjustable and are up about where they ought to be. Labor is more stable. Financing is easier. The American Electric Railway Association is functioning better than ever. Truly, the electric railways have risen to a new plane of stability and security.

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Car Design as Reflected by Purchases in 1924

THE number of new cars ordered during 1924 continued at the high level reached in 1923. This is very encouraging as the total volume of electric railway business follows closely the amount of rolling stock purchases and indicates a promising future with more passengers, better service and increased earnings. The 4,000 mark in number of cars ordered, considered as a high average, has again been exceeded this year with a total of 4,092 new cars and electric locomotives. Compared with other years this is the highest since 1913. The years of 1917, 1918 and 1919 were lean ones with the average number of new cars running about 2,400. The low point for rolling stock purchases was in 1921 with but 1,276 cars and electric locomotives. The number purchased in 1922 was 3,538 and in 1923 there were 4,029.

The greatest percentage increase in cars ordered is for interurban service. There is a 26 per cent increase in interurban passenger cars over last year and the total of 538 is the largest for any year since 1913. It is evident that the financial condition of the interurbans is improved. Their traffic and their purchasing power should increase as modernization goes on.

It is interesting to follow the trends in car design as reflected in the statistics year by year. Previous to 1916 cars were heavy, the principal thought being to reduce maintenance through substantial construction. The vestibuling of platforms was an improvement of that period, which was followed by many center-entrance type cars without platforms. In 1916 light-weight construction was a principal feature and with it came the one-man, single-truck car. From 1916 through 1919 the one-man, single-truck car increased in popularity, so that in 1919 this type of car constituted 69 per cent of the total motor-passenger cars purchased for city service. That was the peak for small one-man cars. Since then larger cars have been increasingly favored for one-man operation.

In 1922 cars arranged for operation by either one or two men made their appearance. During 1924 this has been the most common type of car purchased. Thus, the total number of new cars for city service of one-man, two-man type was 1,224, which is 62 per cent of the total number of motor-passenger cars purchased for city service.

An outstanding feature in the development of car design last year was the increased attention given to large articulated units. The Department of Street Railways for the City of Detroit placed a triplex car in service last March and the Brooklyn-Manhattan Transit Corporation has ordered four triplex cars which will be placed in rapid transit service soon. In addition to these orders from car builders, the United Railways & Electric Company of Baltimore remodeled two cars to form a duplex articulated car, which is now being tried out. The Brooklyn-Manhattan Transit Corporation placed a similar type of articulated unit in service last February and the Milwaukee Electric Railway & Light Company is now rebuilding 384 bodies to form 192 duplex articulated units.

The advantages of these types of car include reductions in weight, noise, first cost and operating cost together with possible increase in comfort and convenience for passengers. The particular field of usefulness for articulated cars is in service where train operation is needed. This applies particularly to interurban and rapid-transit service, since there are few cities where surface traffic is so heavy that such units can be used to their fullest advantage.

Although the statistics for 1924 show that large cars are being purchased most, light weight has been a particular feature of new car design. Previous to 1924 weight reduction for city cars was stressed most, but last year's statistics show that this evolution is strongly penetrating the interurban field. The average weight for the double-truck interurban cars purchased last year was 19 tons for a car 44 ft. long.

Eight outstanding facts are shown by the 1924 statistics of electric cars ordered. First, the total number of new cars and electric locomotives is the highest of any year since 1913. Second, the number of passenger cars purchased for city service decreased 32 per cent from the 1923 figures. Third, the number of passenger cars purchased for interurban service increased 26 per cent over 1923 and the number is the largest for any year since 1913. Fourth, the number of electric locomotives bought in 1924 is but one-third as many as in 1923. Fifth, cars built for operation by one man or two men constitute over 62 per cent of the total motor-passenger cars ordered for city service. Sixth, multiple bodied articulated cars are receiving particular consideration. Seventh, light-weight car construction has been given increased attention. Eighth, four-motor equipments are used for the majority of double-truck cars.

Bus Operation by Electric Railways Shows Satisfactory Progress

NOTHING could promise better for the continued success of bus operation by electric railways than the gratifying progress that has been made during the past year. The number of buses has more than doubled while the number of railway companies engaging in bus operation is nearly a third larger than a year ago.

This growth is a healthy sign. It has been rapid enough to indicate that the railways are thoroughly alive to the opportunities which the bus has created, but it has not been too fast. That is to say, railways have not rushed into the use of buses without careful analysis of transportation needs and the ability of buses to fill them.

Particular significance attaches to the fact that the increase in the number of buses has been proportionately much greater than the increase in the number of railway companies operating them. In other words, the primary reason for the great development during the year is that many railways have found buses useful and have added to the number which they were operating a year ago.

This seems to indicate that the experience of those who have tried bus operation has for the most part been satisfactory. In fact, according to the reports which the JOURNAL has received, only one important railway which operated buses a year has abandoned this type of service. In this instance a street railway line was built into the district formerly served by the buses, and with the inauguration of car operation there was no longer any need for the buses.

Another reason for the increase in the number of buses is, of course, the constantly growing number of railway companies which have undertaken this form of transportation service. Since the publication of a list

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of electric railway bus operators in the 1924 Statistical Number of this paper, a net addition of 35 companies has been made to the list. A majority of the newcomers in the bus business have been among the smaller railways, and the number of buses which they operate is not large. Nevertheless, this expansion is an interesting indication of the widening understanding of the field of usefulness of the bus.

Buses ordered during the year by electric railways total nearly 1,000. This figure is much larger than that for any previous year. Indications are that it will be greatly exceeded in 1925. That the number of buses ordered is 963 while the number shown as added to the equipment of electric railways is 1,255 may be accounted for in large measure by the acquisition of many independent bus lines, together with much second-hand equipment.

These record-breaking figures for buses owned and ordered by electric railways during the past year carry all the more weight because of the care exercised in obtaining the information. In nearly every case this was secured directly from an official of the company concerned. Because bus operation is carried on in certain instances by a subsidiary under another name, however, it is possible that a few railways have been omitted from the list. Such omissions, if they exist, do not greatly affect the figures, and their inclusion would serve only to augment a total which is already impressive.

More New Track Built than in Any Other Recent Year

THAT a greater mileage of new electric railway track was built in 1924 than in any other year since 1917 is particularly significant because this occurred during a period when the number of buses operated by railway companies was more than doubled. Thus it seems that the industry is expanding simultaneously in two directions. On the one hand the railways each year are furnishing more and better bus service, while on the other hand they are increasing their trackage to provide additional car service.

A study of the details of track extensions made during the past year by 112 different companies shows that the increase was due to many small additions rather than to a few very large ones. A majority of the railways reporting extensions constructed less than 4 miles apiece. Thirteen railways added 5 miles or more to their trackage. In California the San Diego Electric Railway built 19 miles of interurban line and 3 miles of city track. Other large extensions include those of the Philadelphia Rapid Transit Company and the Detroit United Railway with about 11 miles each, and the Cincinnati Traction Company, Pacific Electric Railway and Toronto Transportation Commission with more than 10 miles each.

From the figures of track rebuilt the impression is derived that the industry has nearly caught up with its deferred reconstruction. The total for 1924 was just over 764 miles, which is slightly less than for the preceding year. It is larger, however, than for 1922 or for any other post-war year, except 1923.

Electrification of steam railroad lines continued at a rate considerably in excess of that of the preceding year or any year since 1919. A total of more than 80 miles was electrified during 1924. The combined total of electrifications and electric railway track built and rebuilt exceeds the corresponding figures for 1923, and is the greatest for 7 years.

Electric Railway Costs Becoming Stabilized

IN LAST year's Annual Statistical Number the prediction was made that electric railway operating costs were becoming stabilized and that little change should be anticipated during the year. That this forecast was justified may be seen by reference to the article in this week's issue by Professor Richey, in which he presents the trend of costs and fares during 1924. In wholesale prices the changes from month to month were fractional, the index for November, 1924, being 153 as compared with 152 for the corresponding month of 1923. Construction costs showed a small but steady downward trend during the year, falling 11.7 points to 203.6 for December. Electric railway operating materials showed a smaller drop, from 158 to 149. Wages, on the contrary, went up from 216.4 to 220.8, but this was about balanced by an increase in fares from 142.4 to 148.1.

All of these figures show a notable stabilization in costs as compared with the violent fluctuations of the years before. It means that managers can now proceed with more confidence in making estimates for expenditures, and can plan for the future with the assurance that their calculations will not be upset overnight.

With conservatives in control at Washington, and a continuing constructive national policy, it seems fair to assume that in the year just beginning the stabilization of last year will be continued. This points clearly to prosperity for the country as a whole and a continuation of satisfactory conditions for the majority of the electric railways. While it is too early to be certain, the probabilities seem to point in the direction that these conditions will prevail all through the Coolidge administration.

Are Your Job Seekers Treated This Way?

HE STEPPED into the anteroom of the office of B. J. Fallon, general manager Chicago Rapid Transit Company, with the timid, apologetic air so often observed on the face of the job seeker. In half-whispered tones he asked the man at the information desk if this was where he could apply for work. He was put at his ease in a moment. The good-natured information man was not content merely to direct him to Room So and So on another floor, but first wrote down the number on a slip and then called upon a boy to escort the applicant to the correct room. The courtesy of the transaction could not have been exceeded if the visitor had been a wealthy man come to confer a favor.

It is not known whether the applicant was the right man for any railway job, if such job was available. It is certain, however, that he must have left the building with the feeling that this particular railway was not a heartless institution, but a rather human affair after all. If he and a railway job did come together, his reception in the anteroom was the right beginning. Whenever a courtesy bulletin comes down from above, he will not forget his first contact as proof that the management practices what it preaches.

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$342,000,000 of Purchases Planned in 1925

Largest Expenditures in Many Years in Prospect by Electric Railways of U. S. This Year—"Journal's" Estimate of Industry Budget for New Year Shows 30 per Cent Increase Over Purchases of 1924

ELECTRIC railways of the United States will spend in 1925 the sum of $211,500,000 for new plant and equipment. This is $73,500,000, or 59 per cent, more than the actual expenditure for new plant and equipment during 1924. They will spend $130,500,000 additional for maintenance materials and supplies. This is about the same amount as last year.

The total expenditures planned in the tentative budgets of the electric railways for 1925, exclusive of all labor costs, is thus somewhere in the neighborhood of $342,000,000. This compares with an actual expenditure in 1924 of $262,700,000—an expected increase for 1925 of 30 per cent.

In compiling these estimates of expenditures, information was requested as to what the railways plan to buy during the coming year and what they did buy during the past year. Under the classification of expenditures "for new plant and equipment" was to be included such items as new cars and car equipment, track tools and materials, paving materials, shop machinery and tools, power equipment, buildings and structures, and any other items which will be a permanent part of the railway plant. Under the classification of expenditures "for maintenance materials and supplies" was to be included all items purchased for the regular repair and maintenance work in all departments and the supplies and materials consumed in operation. This includes the numerous detail supplies such as motor brushes, waste, oil, brake shoes, metal stock, wheels, miscellaneous small tools, trolley wire and other line materials for replacements, etc. In both classifications the figures were requested for expenditures exclusive of labor. The sums here presented are thus of course only a part of the enormous outlay of moneys by the electric railways to cover all operating expenses and the charges to capital account.

The figures are tabulated herewith to show a comparison of the probable expenditures during 1925 with the estimates of actual expenditures during the years 1922, 1923 and 1924. From this it will be seen that the new year holds forth the prospect of larger expenditures than in any previous year since the JOURNAL started this estimate of the industry's budget. Looking at the figures by major accounts, all items show an increase over former years except one. The purchases for maintenance of equipment show a decrease of about $2,000,000.

"ELECTRIC RAILWAY JOURNAL'S" ESTIMATE OF EXPENDITURES OF THE INDUSTRY

	1922	1923	1924	1925
New Plant and Equipment				
Way and structures	$85,000,000	$74,000,000	$56,000,000	$75,700,000
Equipment	38,000,000	78,000,000	60,200,000	103,400,000
Power	28,000,000	28,000,000	17,000,000	32,400,000
Total	$151,000,000	$180,000,000	$133,200,000	$211,500,000
Maintenance Materials and Supplies				
Way and structures	$42,000,000	$57,500,000	$58,200,000	
Equipment	44,000,000	54,000,000	52,100,000	
Power	16,000,000	18,000,000	20,200,000	
Total	$102,000,000	$129,500,000	$130,500,000	
Total of New Plant and Maintenance Materials				
Way and structures	$116,000,000	$113,500,000	$133,900,000	
Equipment	122,000,000	114,200,000	155,500,000	
Power	44,000,000	35,000,000	52,600,000	
Grand total	$282,000,000	$262,700,000	$342,000,000	

The largest increases in comparison with last year are for new equipment and new power facilities. For the latter there is an indicated increase in expenditures of 90 per cent; for new equipment, an increase of 71 per cent. But there is also to be a large expansion of trackwork, this indicated increase being 35 per cent.

The method employed this year in compiling this estimate of the budget of the electric railway industry is the same as that followed last year and the year before and explained in detail on page 30, issue of Jan. 6, 1923, and again on page 4, issue of Jan. 5, 1924. This year budget figures were received from 51 companies, from which the estimate of the whole industry was calculated, using as heretofore both track mileage and cars operated as bases of spreading the known budget units. The average of the two methods was used for the final figures, since neither alone is a proper measure of the buying power of the industry.

By requesting not only the estimate of expenditures planned for the new year but also the actual expenditures made during the year just past, the JOURNAL obtains a check upon its previous year's estimate of the future purchases. The actual figures this year are in close agreement with the amounts estimated last January, as follows:

	Estimated in Issue of Jan. 5, 1924	Actual Disclosed This Issue
New Plant and Equipment		
Way and structures	$53,000,000	$56,000,000
Equipment	70,000,000	60,200,000
Power	27,000,000	17,000,000
Total	$150,000,000	$133,200,000
Maintenance Materials and Supplies		
Way and structures	$44,000,000	$57,500,000
Equipment	53,000,000	54,000,000
Power	15,000,000	18,000,000
Total	$112,000,000	$129,500,000
Total for New Plant and Maintenance Materials		
Way and structures	$97,000,000	$113,500,000
Equipment	123,000,000	114,200,000
Power	42,000,000	35,000,000
Grand total	$262,000,000	$262,700,000

This comparison is of course not a measure of the accuracy of the JOURNAL'S work, but rather a statement of the extent to which budget plans were actually carried out and expenditures made within the year in which they were anticipated.

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Bus Operation by Electric Railways Doubled During 1924

The Number of Railway Companies Furnishing Bus Service Has Increased from 121 to 156 and Many Others Have Extended the Scope of Their Operations—Buses Now Operated by Railways Total 2,462—A Larger Number Were Ordered During 1924 than in Any Previous Year

AT THE end of 1924 the number of buses operated by electric railways in the United States and Canada was approximately twice the number in operation a year ago, as shown in a survey conducted by this paper. This big increase occurred in large measure because many railways which were operating buses in 1923 added more during the year just past. At the same time there was also a marked increase in the number of companies engaged in these undertakings. Figures given in the accompanying tables are based on replies received directly from the companies named and may be taken to represent an irreducible minimum. Because bus operation is carried on in some instances in the name of a subsidiary company, it is possible that a few smaller railways have been omitted from the list. Their inclusion, however, would not greatly affect the total figures.

The expansion was confined to no one section of the country. The largest increase in the number of buses was made by a railway on the Atlantic seaboard, while a company in Ohio was second, and another in California added the third largest number. Substantial increases were made in nearly every state and also in Canada.

During the year the largest single addition to the number of buses operated was made by Public Service Railway, Newark, N. J., which added more than 500 buses to its equipment. This was done as part of an extensive plan to buy out competitive buses and co-ordinate the transportation service throughout the area where the railway operates. Already great progress has been made toward this end. There remain, however, a considerable number of buses which are still running in competition with the railway. This competition will have to be eliminated before the transportation system can be entirely co-ordinated. All of the buses thus bought by the railway were second-hand machines. Many of them, however, have since been retired from service and their places taken by new vehicles. For that purpose, Public Service Railway has bought a large number of Yellow Coaches, White, Fageol and Mack buses. More buses of the first two types are on order at the present time and delivery is expected in the near future. As a result of this great expansion, this

List of Electric Railways Operating Buses

Railway	Subsidiary	No. Buses
Connecticut		
Danbury & Bethel St. Ry., Danbury		4
Connecticut Co., New Haven		60
Groton & Stonington St. Ry., Norwich		5
Hartford & Springfield St. Ry., Warehouse Point		7
Waterbury & Milldale Tramway, Waterbury		1
Maine		
York Utilities Co., Sanford		5
Massachusetts		
Attleboro Branch RR., Attleboro		2
Eastern Massachusetts St. Ry., Boston		43
Boston Elevated Ry., Boston		66
Connecticut Valley St. Ry., Greenfield		3
Northern Massachusetts St. Ry., Greenfield		1
Holyoke St. Ry., Holyoke		2
Union St. Ry., New Bedford		3
Middlesex & Boston St. Ry., Newtonville		12
Plymouth & Brockton St. Ry., Plymouth		2
Springfield St. Ry., Springfield		9
Rhode Island		
Newport Elec. Corp.		7
United Electric Rys., Providence		48
Vermont		
Twin State Gas & Electric Co., Brattleboro		3
Delaware		
Tide water Power Co., Wilmington		3
District of Columbia		
Capital Traction Co.		11
Washington Ry. & Electric Co.		23
Washington & Virginia Ry.		2
Maryland		
United Rys. & Electric Co., Baltimore	Baltimore Transit Co.	44
Potomac Edison Co., Cumberland		2
Potomac Public Service Co., Frederick		15
New Jersey		
Millville Traction Co., Millville		7
Coast Cities Ry., Asbury Park		20
Public Service Ry., Newark	Public Service Trans. Co.	593
Morris County Traction Co.		1
Trenton & Mercer County Trac. Co., Trenton	Central Transportation Co.	19

Railway	Subsidiary	No. Buses
New York		
International Ry., Buffalo	International Bus Corp.	34
Binghamton Ry., Binghamton		1
Jamestown St. Ry., Jamestown		11
United Traction Co., Albany	Capitol District Trans. Co.	2
Newburgh Public Service Corp., Newburgh		32
Brooklyn-Manhattan Transit Corp., N. Y.		10
Niagara Gorge Ry., Niagara Falls	Niagara Gray Bus Line	5
New York State Rys., Rochester	East Ave. Bus Co. & Roch. Ry. Co-ord. Bus Line	17
New York State Rys., Syracuse	Syracuse Ry. Co-ordinated Bus Line	7
New York State Rys., Utica	Utica Ry. Co-ordinated Bus Line	2
Pennsylvania		
Altoona & Logan Valley Elec. Ry., Altoona	Logan Valley Bus Co.	11
Schuykill Ry., Girardville		6
Johnstown Traction Co., Johnstown	Traction Bus Co.	5
Conestoga Traction Co., Lancaster	Conestoga Trans. Co.	2
Lewistown & Reedsville Elec. Ry., Lewistown	Lewistown Trans. Co.	2
Beaver Valley Traction Co., New Brighton		6
Citizens Traction Co., Oil City	Citizens Transit Co.	4
Philadelphia Rapid Transit Co., Philadelphia	Phila. Rural Transit Co.	17
Westmoreland County Railway, Pittsburgh		2
Pittsburgh, Harmony & Butler & New Castle Ry., Harmony		5
Jefferson Traction Co., Punxsutawney		2
Reading Transit & Light Co., Reading		3
Scranton Ry., Scranton	Scranton Bus Co.	2
Northumberland County Ry. Sunbury	Sunbury Transit Co.	2
Philadelphia & West Chester Traction Co., Upper Darby		3
West Chester St. Ry., West Chester	Peoples Transportation Co.	21
Williamsport Pass. Ry., Williamsport	Williamsport Transp. Co.	3
York Rys., York	York Transit Co.	5
Virginia		
Newport News & Hampton Ry., Gas & Electric Co., Hampton		5
West Virginia		
Wheeling Public Service Co., Wheeling		4
Monongahela Power & Ry., Fairmont	Pioneer Transport Co.	3
Princeton Power Co., Princeton		1

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List of Electric Railways Operating Buses (Concluded)

Railway	Subsidiary	No. Buses
Illinois		
Centralia Traction Co.		1
Chicago & West Town Ry., Oak Park		7
Chicago, North Shore & Milwaukee, Highwood		43
Evanston Ry., Evanston	Evanston Bus Co.	5
East St. Louis & Suburban Ry., East St. Louis		6
Chicago & Joliet Electric Ry., Joliet	Chicago & Joliet Trans. Co.	2
Illinois Power & Light Corp., Decatur		15
Illinois Power & Light Corpn., Galesburg		4
Illinois Power & Light Corp., Peoria		6
Bloomington, Pontiac & Joliet Ry., Pontiac		1
Rockford & Interurban Ry., Rockford		6
Tri-City Ry., Rock Island		2
Indiana		
Union Traction Co. of Indiana, Anderson		1
Evansville & Ohio Valley Ry., Evansville		1
Gary St. Ry., Gary		16
Interstate Public Service Co., Indianapolis		11
Chicago South Bend & Northern Indiana Ry., South Bend		13
Iowa		
Des Moines City Ry., Des Moines		3
Mississippi Valley Elec. Co., Iowa City		5
Dubuque Electric Co., Dubuque		3
Waterloo, Cedar Falls & Northern Ry., Waterloo	Cedar Valley Road	7
Kentucky		
Louisville Ry., Louisville	Kentucky Carriers Inc.	12
Michigan		
City of Detroit Dept. of St. Rys., Detroit		25
Grand Rapids Ry., Grand Rapids		6
Michigan Electric Ry., Jackson		19
Muskegon Traction & Lighting Co., Muskegon		2
Saginaw Transit Co., Saginaw		28
Minnesota		
Twin-City Rapid Transit Co., Minneapolis		3
Missouri		
Kansas City, Clay County & St. Joseph Ry., Kansas City		6
United Rys., St. Louis	St. Louis Bus Co.	4
Springfield Traction Co., Springfield		14
Ohio		
Northern Ohio Traction & Light Co., Akron	Northern Transit Co.	75
City of Ashtabula Div. of St. Rys., Ashtabula		3
Columbus, Newark & Zanesville Elec. Ry., Columbus	Columbus & Zanesville Transp. Co.	13
Ohio Service Co., Coshocton		5
Columbus, Urbana & Western Elec. Ry.		2
Steubenville, East Liverpool & Beaver Valley Traction Co., East Liverpool	Valley Motor Trans. Co.	2
Hocking Sunday Creek Trac. Co., Nelsonville		1
Indiana, Columbus & Eastern Traction Co., Springfield		16
Springfield Ry., Springfield		1
Pennsylvania-Ohio Elec. Co., Youngstown	P. O. Coach Lines	39
Youngstown Munic. Ry., Youngstown		41
Youngstown & Suburban Ry., Youngstown	Y & S Transportation Co.	14
Wisconsin		
Wisconsin Public Service Corp., Green Bay	Riverview Motor Bus Co.	2
Wisconsin Gas & Electric Co., Kenosha		8
Milwaukee Elec. Ry. & Light Co., Milwaukee	Wisconsin Motor Bus Lines	104
Eastern Wisconsin Electric Co., Oshkosh		14
Wisconsin Valley Electric Co., Wausau	Valley Transit Co., Merrill Bus Line	4
Alabama		
Birmingham Electric Co., Birmingham		4
Arkansas		
Inter-City Terminal Ry., North Little Rock		12
Georgia		
Columbus Electric & Power Co., Columbus	Columbus Trans. Co.	3
Louisiana		
New Orleans Public Service, New Orleans		10
Mississippi		
Vicksburg Light & Traction Co., Vicksburg		2
North Carolina		
Carolina Power & Light Co., Raleigh		2
South Carolina		
South Carolina Gas & Elec. Co., Spartanburg		4
Tennessee		
Nashville Interurban Ry., Nashville		1
California		
Bakersfield & Kern Elec. Ry., Bakersfield		5
Los Angeles Ry., Los Angeles	Los Angeles Motor Bus Co.	*112
Pacific Electric Ry., Los Angeles	Pacific Electric Land Co.	154
San Francisco & Sacramento Ry., T. F., Oakland		1
Key System Transit Co., Oakland		13
Pacific Gas & Electric Co., Sacramento		4
San Diego Electric Ry., San Diego		10
Munic. Ry. of San Francisco		10
Peninsular Ry., San Jose		3
Santa Barbara & Suburban Ry., Santa Barbara		6
Stockton Electric Ry., Stockton		3
Kansas		
Salina St. Ry., Salina		1
New Mexico		
City Electric Co., Albuquerque		2
Oklahoma		
Tulsa St. Ry., Tulsa		16
Okmulgee Traction Co., Okmulgee		3
South Dakota		
Sioux Falls Traction System, Sioux Falls		8
Texas		
Abilene Traction Co., Abilene		1
Eastern Texas Electric Co., Beaumont		1
Houston Electric Co., Houston		18
Marshall Traction Co., Marshall		1
San Antonio Public Service Co., San Antonio		16
Utah		
Utah Light & Traction Co., Salt Lake City		1
Washington		
Puget Sound Int. Ry., & Pwr. Co., Everett		17
Puget Sound Elec. Ry. Co., Bellingham		12
Pacific Northwest Traction Co., Seattle	Thompson-Smith Trans. Co.	31
Seattle Munic. St. Ry., Seattle		14
Seattle & Rainier Valley Ry., Seattle		2
Puget Sound Electric Railway, Tacoma		12
Canada		
British Columbia Electric Ry., Vancouver	British Columbia Rapid Transit Co.	11
Brantford Munic. Ry., Brantford		2
Winnipeg Electric Ry., Winnipeg		16
Nova Scotia Tramways & Pwr. Co., Halifax		2
Hydro Electric Rys., Toronto		4
Toronto Transportation Co., Toronto		20
Montreal Tramways, Montreal		4
Ottawa Electric Railway, Ottawa		5
Quebec Railway Light & Power Co., Quebec		4
Total		2,462

*Includes 78 buses in which railway has one-half interest.

company now owns 593 buses, which is more than twice as many as any other railway in this country. Indications are that a year from now the number of buses owned by Public Service will be considerably larger than it is at the present time.

Second in number of buses added during the year is the Northern Ohio Traction & Light Company at Akron, which now owns 75 buses. This increase has come about as the result of the total suspension of railway service from Feb. 1 to 28 of this year, and the subsequent resumption of operations on a new basis, as told in ELECTRIC RAILWAY JOURNAL for March 1.

In California the addition of 52 buses to the equipment of the Pacific Electric Railway, Los Angeles, was the third largest increase during the year. This company has now become the second largest operator of buses in the country, with 154 vehicles. Of this number 39 are operated by the Los Angeles Motorbus Company. In this same territory the Los Angeles Railway owns 34 buses, and has a half interest in 78 others, making a total of 112. Altogether the two railways are engaged in the operation of 266 buses in this part of the state. It appears possible that developments during the coming year may deprive the Pacific Electric Railway of second place in number of buses, as the Philadelphia Rapid Transit Company has recently ordered 200 new gas-electric buses for operation in that city.

Important increases have occurred in the number of buses operated by electric railways in New England. The Boston Elevated Railway during the past year has added 35 buses, the United Electric Railways of Providence 20, the Connecticut Company 13, and the Eastern Massachusetts Street Railway 12. In this same region the Middlesex & Boston Street Railway, with 12 vehicles, has joined the ranks of bus operators

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as told in this paper for Dec. 6. Other new companies in this region include the Waterbury & Millvale Tramway, the York Utilities Company in Maine, and the Newport Electric Corporation.

Bus operation in New Jersey has advanced rapidly outside of the territory of Public Service Railway as well as in it. At Asbury Park the Coast Cities Railway now has 20 buses. A number of these are double-deck vehicles for use during the heavy traffic summer months. The Trenton & Mercer County Traction Company has increased the total number of its buses to 14 and the Millville Traction Company has jumped from one bus to seven.

Reports received from electric railways in New York State indicate that the expansion of railway bus operation there has not been as great as elsewhere. During the year there has been much talk of the establishment of an extensive system of buses in New York City. Proposals have been made that these vehicles be operated by different independent companies, and several of the electric railways have offered to undertake to furnish such service. So far, however, nothing definite has been done. Upstate the New York State Railways has added 14 buses. The United Traction Company of Albany and the Binghamton Railway are newcomers in the field of bus operation.

An order for 200 gas-electric buses for the Philadelphia Rapid Transit Company is the outstanding bus development of the year in Pennsylvania. Elsewhere in the state a number of new names appear in the list of electric railways operating buses. Among these are the Northumberland County Railway, Pittsburgh, Harmony, Butler & Newcastle Railway, the Reading Transit & Light Company, Westmoreland County Railway, Philadelphia & West Chester Railway and the Scranton Railway. In the vicinity of Philadelphia, the West Chester Street Railway has developed bus service covering nearly 200 route-miles. This was told in ELECTRIC RAILWAY JOURNAL for Nov. 22.

A marked increase in the number of buses operated by electric railways has occurred in Ohio. At Youngstown the Pennsylvania-Ohio Electric Company has added 13 buses to its already large fleet, the Youngstown & Suburban Railway and the Youngstown Municipal Railway have added 10 each. The Ohio Service Company and the Columbus, Urbana & Western Railway have undertaken bus operation. In Indiana the Interstate Public Service

Buses Ordered by Railways During 1924

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Philadelphia Rapid Transit Co.	200	125*	Yellow Coach Z	Yellow Coach	66
		75	Yellow Coach Z	Yellow Coach	29
Public Service Railway	175	50	White 50 A	Bender	29
		75	Yellow Coach Z	Yellow Coach	29
		25	Mack	Mack	25
		25	Fageol	Fageol	29
Northern Ohio Traction & Light Co.	42	14	White	Bender	21
		10	White	Kuhlman	25
		3	Mack	Mack	25
		3	Mack	Kuhlman	25
		6	Mason	Weatherproof	21
		6	Reo	Fitzjohn	21
Boston Elevated Railway	37	17	Mack	Mack	25
		14	White	Brown	25
		4	White	Brown	25
		1	Yellow Coach	Yellow Coach	29
		1	Fageol	Fageol	29
International Ry., Buffalo	28	16*	.....	.....	..
		12	.....	.....	..
City of Detroit Dept. of St. Rys.	26	25	Dodge-Graham	Graham	21
		1	Gottfreson	Gottfreson	..
Milwaukee Electric Ry. & Lt. Co.	26	10	Yellow Coach Z	Yellow Coach	29
		5*	Yellow Coach Z	Yellow Coach	67
		5	White 50 A	Bender	25
		5	Fageol	Fageol	23
		1	Pierce-Arrow	Bender	26
Los Angeles Railway	22	16*	Fageol	Fageol	58
		5*	Moreland	Moreland	59
		1*	Moreland	Moreland	58
Pacific Electric Ry.	22	12	Fageol	Fageol	29
		10*	Fageol	Fageol	66
Houston Electric Co.	18	10	Fageol	American Car Co.	29
		1	Yellow Coach	St. Louis Car Co.	29
		6	Yellow Coach	Yellow Coach	29
		1	Fageol	American Car Co.	29
Chicago N. Shore & Milwaukee R.R.	17	13	Yellow Coach Z	Yellow Coach	29
		4	Fageol	Fageol	22
United Electric Rys., Providence	17	13	White	Brown	29
		2	Pierce-Arrow	Brown	29
		2	Mack	Brown	29
Connecticut Company	16	4	Yellow Coach	Yellow Coach	29
		4	Pierce-Arrow	Pierce-Arrow	29
		2	Mack	Mack	25
		2	Mack	Bender	29
		2	Fageol	Fageol	29
		2	White	Hoover	29
Coast Cities Ry.	16	9*	Yellow Coach	Yellow Coach	67
		7	Yellow Coach	Yellow Coach	29
Trenton & Mercer County Tract. Co.	13	11	Fageol	Fageol	29
		1	Fageol	Kuhlman	29
		1	Six Wheel	Six Wheel	29
Middlesex & Boston Street Ry.	12	12	White 50 A	Bender	25
San Antonio Public Service Co.	12	6	Fageol	Fageol	29
		5	Reo	Reo	21
		1	Yellow Coach	Yellow Coach	29
Interstate Public Service Co.	11	11	White	Bender	25
New York State Rys.	11	6	Brockway	Bender	25
		2	Mack	Lang	22
		2	Brockway	N. Y. S. Rys.	18
		1	Brockway	N. Y. S. Rys.	20
Pennsylvania-Ohio Electric Co.	11	10	White 50 A	Bender	25
		1	White 50 A	Bender	20
Chicago S. Bend. & N. Indiana Ry.	10	5	Mack	Mack	25
		5	Garford	Superior	25
Youngstown Munic. Ry.	10	10	.....	.....	..
South Carolina Gas & Elec. Co.	10	10	White & Graham	Bender	21
Indiana, Columbus & Eastern Traction Co.	9	9	Fageol	Fageol	22
Eastern Mass. St. Ry.	9	2	Brockway	Patterson	21
		7	Fageol	Fageol	27
Key System Transit Co.	8	7	Fageol	Fageol	29
		1	Ford	Key System Trans. Co.	14
Hartford & Springfield St. Ry.	7	6	Guilder	Patterson & Superior	25
		1	Fageol	Superior	25
Newport Electric Corp.	7	5	Fageol	Fageol	22
		2	Fageol	Fageol	29
Mesaba Ry.	7	7	.....	.....	16
Kansas City, Clay County & St. Joseph Ry.	6	5	Fageol	Fageol	28
		1	Graham	Graham	18
Toronto Transportation Comm.	6	6	White 50 A	Smith Bros. & T.T.C.	29
Eastern Wisconsin Elec. Co.	6	6	.....	.....	..
Chicago & West Towns Ry.	5	5	Mack	Mack	26
New Orleans Public Service, Inc.	5	5	Yellow Coach	Yellow Coach	29
Springfield St. Ry.	5	4	Garford	Superior	25
		1	Yellow Coach	Yellow Coach	29
Twin City Rapid Transit Co.	5	1	White	Eckland Bros.	16
		1	Mack	Lang	30
		1	White	Eckland Bros.	16
		1	Wilcox	Twin City	30
		1	Fageol	Fageol	30
Seattle Munic. St. Ry.	5	5	Garford	S. M. Ry.	29
Youngstown & Suburban Ry.	5	3	Fageol	Fageol	22
		2	Studebaker	Miller	11
Washington Ry. & Electric Co.	5	3	Graham Type F.A.	Hoover	30
		2	Graham Type J.B.	Hoover	20
Gary St. Ry.	4	4	Yellow Coach	Yellow Coach	29
Illinois Power & Light Corp.	4	2	Yellow Coach	Yellow Coach	29
		2	Reo	Reo	21
United Rys. & Elec. Co. Baltimore	4	4*	5 Ave. Type L	Fifth Ave.	51
Mississippi Valley Electric Co.	4	4	Mack	Mack	26

*Denotes double-deck bus.

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Buses Ordered by Railways During 1924 (Concluded)

Name of Company	Total	No of Each Type	Type of Chassis	Body Builder	Seating Capacity
United Rys. of St. Louis	4	4	White	Brown	29
Columbus, Newark & Zanesville	4	2	Fageol	Fageol	22
		2	Fageol	Fageol	28
Electric Ry.	4	4	G. M. C. K-20		24
Winnipeg Electric Co.	4	2	Garford	Garford	25
Altoona & Logan Val. Elec. Ry.	4	2	Garford	Garford	21
		3	Dodge	Graham	22
Reading Transit & Light Co.	4	1	White	Bender	25
Waterloo, Cedar Falls & N. Ry.	3	3	Mack	Mack	25
East St. Louis & Suburban Ry.	3	3	Yellow Coach Z	Yellow Coach	29
Pacific Northwest Traction Co.	3	3	Fageol	P. N. T.	45
Tidewater Power Co.	3	3	Graham	Hoover	18
Williamsport Passenger Ry.	3	3	Reo	Reo	21
		2	White	Eckland	25
Sioux Falls Traction System	3	1	Reo W.	Auto Body Co.	21
Wisconsin Gas & Elec. Co.	3	..	.....	.....	..
		2	White	Bender	25
Capital Traction Co.	3	1	Fageol	Fageol	29
Columbus Ry. Power & Lt. Co.	3	3	Mack	American Car Co.	29
Munic. Ry. of San Francisco	2	2	White 50 A	Brown	25
		1	Federal	Local	..
Springfield Traction Co.	2	1	Graham	Graham	..
United Traction Co., Albany	2	2	Pierce-Arrow	Brown	29
Syracuse & Eastern R.R.	2	2	Reo W	Patterson Vehicle Co.	..
		1	White	Bender	16
Carolina Power & Light Co.	2	1	White	Bender	21
Scranton Ry.	2	2	Dodge-Graham	Dodge-Graham	20
Westmoreland County Ry.	2	2	Fageol	Fageol	29
Wisconsin Valley Electric Co.	2	2	G. M. C.	Old body used on new chassis	13
Michigan Electric Rai'way	2	2	.....	.....	..
Aurora, Elgin & Fox Riv. Elec. Co.	2	2	White	Shaefer	..
San Francisco-Sacramento R.R.	1	1	Fageol	Hall-Scott Co.	29
Asheville Power & Light Co.	1	1	White	White	..
Bloomington, Pontiac & Joliet Ry.	1	1	White	White	16
City of Ashtabula	1	1	Mack	Kuhlman	29
Union Traction Co. of Indiana	1	1	Pierce-Arrow	Kuhlman	..
York Railways	1	1	Fageol	Fageol	29
Marshall Traction Co.	1	1	Reo	Reo	22
Utah Light & Traction Co.	1	1	White	White	12
Abilene Traction Co.	1	1	Reo	Reo	21
Dayton, Springfield & Xenia So. Ry.	1	1	Garford	Garford	21
Waterbury & Milldale Tramway	1	1	White	Kuhlman	24
Evansville & Ohio Valley Ry.	1	1	Graham	Graham	17
Binghamton Ry.	1	1	Mack	Mack	25
Puget Sound Elec. Ry.	1	1	White	Christy	22

*Denotes double-deck bus.

Company has bought 11 buses. The Union Traction Company of Indiana and the Evansville & Ohio Railway have also entered the bus game. At Decatur, Galesburg and Peoria the Illinois Power & Light Corporation is now operating buses. Co-ordination of railway and bus service at Decatur was described in this paper on Nov. 29. The North Shore Line has added 16 buses to its equipment during the year and the Chicago, South Bend & Northern Indiana Railway has added 10.

Expansion of bus operations has marked the railway situation in the south as well as in other sections of the country. Among the companies which during the past year have undertaken to furnish bus service are the Newport News & Hampton Railway, Gas & Electric Company, Columbus Electric & Power Company in Georgia, New Orleans Public Service, Inc., Carolina Power & Light Company, Nashville Interurban Railway, Abilene Traction Company in Texas and also the Marshall Traction Company. Moreover, the San Antonio Public Service Company, the South Carolina Gas & Electric Company and a number of others have made important increases in the number of buses operated.

On the Pacific Coast there has been a gain in the number of buses operated in other districts besides Los Angeles. The Pacific Northwest Traction Company has added 18 buses during the year and the Pacific Gas & Electric Company has undertaken bus operation. Elsewhere throughout California and Washington the railways have also added somewhat to their bus equipment.

Electric railways in Canada have made noteworthy progress in bus operation. The greatest increase in the number of vehicles is that of the British Columbia Electric Railway, Vancouver, which has added nine. The Toronto Transportation Commission has also extended the scope of its bus operation. New railways in Canada listed among those operating buses at present are the Brantford Municipal Railway, the Hydro-Electric Railways, the Ottawa Electric Railway, and the Quebec Railway, Light & Power Company.

More Buses Bought than in Any Previous Year

The number of buses ordered during 1924, according to information compiled by ELECTRIC RAILWAY JOURNAL, was 963. This is an increase of 342 over the number ordered during 1923 and is greater than the number ordered in any previous year. An interesting fact in this connection is that 191 of these were double-deck buses. By far the largest single order of double-deck buses was that of the Philadelphia Rapid Transit Company, which purchased 125. Others were bought in Baltimore, Milwaukee and Los Angeles. Altogether upward of 70 electric railways are included in the list of those ordering new buses during the year.

Other automotive equipment ordered during the year was approximately the same as the year before. The number of trackless trolleys bought was somewhat less, totaling only seven. Seventy-three trucks of various sorts were bought by electric railways. Miscellaneous automotive equipment, including tower trucks, snow loaders, automobile welding outfits and fire apparatus, numbered approximately 25.

	Motor Buses Ordered	Trolley Buses Ordered	Other Automotive Equipment Ordered	Total
1922	240	6	112	358
1923	621	15	148	784
1924	1063	7	105	1175
Increase 1924 over 1923	442	8*	43*	391

* Denotes decrease.

In addition to the buses for which orders have actually been placed, the Detroit United Railways has completed arrangements for financing the purchase of 75 such vehicles. It is understood that these will be 25 single-deck, 29-passenger buses, 10 double-deck, 66-passenger buses, both groups to have six-cylinder motors, and 40 more single-deck four-cylinder buses.

Statistics of the Industry

IN EACH of the Annual Statistical Numbers for some years back, tables have been published showing by states the miles of track and cars operated by the electric railway companies in the United States. A corresponding table, made up from reports obtained for the 1925 McGraw Electric Railway Directory will be published in an early issue of this paper.

It is hoped at the same time to publish a table showing a division of the electric motor-passenger cars into the following classes: City and interurban; one-man, two-man and one-man-two-man. Owing to the desire to base these tables on statistics from the 1925 directory, it has been impossible to publish them this week.

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Notes on the News of the Year

An Atttempt to Touch Upon Some of the High Spots of the Year's Work—Serious but Not Too Serious—Many of the Important Events of 1924 Originally Reported to the Extent of 2,000 Pages Pressed Now Into Five

By G. J. MacMurray
News Editor ELECTRIC RAILWAY JOURNAL

APROPOS of the present occasion are the lines of Lewis Carroll to the effect that "Time has come, the walrus said, to speak of many things." Most of it, however, is old stuff. The writer of a review of this kind is in much the same position as was Twain's barber. Running his hand over the face of his illustrious customer, the barber remarked: "Shall I go over it again?" "No," said Mark in his drollest tone, "I heard you the first time." He is telling an old story, and is apt to be rebuked by people who think that an event which happened the day before yesterday is ancient history. Most people are inclined to say as did Richard Brinsley Sheridan: "Our retrospection will be all to the future." In giving up news writing for a day each year to prepare this review I always think of the story of the fellow who went down to Arizona for his health. He turned to painting as a profession and was showing one of his attempts to a visitor from back home.

"And did you do this, John," the visitor said.

"Yes," proudly said the tyro in art, "I did."

"Well, then, for heaven's sake, "Go back to drink. You were a success at that."

ALL RECORDS SMASHED

Going back over the pages of the JOURNAL for the two volumes of 1924, many important items of interest are to be noted in the record of the year's news. It is seen that the electric railways smashed all records in 1923. Figures show that more passengers were carried, more cars operated and more car-miles amassed during the year than for any other similar period. Moreover, revenues were the greatest in the history of the industry. The census figures for 1922, made public in February, 1924, showed that 15,331,401,801 passengers were carried in 1922 as opposed to 14,506,914,573 in 1917. Railway operating revenue was up from $925,477,405 as opposed to $650,149,860 in 1917. For 1921 out of 458 electric railways reporting to the Treasury Department 211 paid income taxes of $3,276,532 on net income of $33,843,158.

The JOURNAL estimated in its issue of Jan. 5 last year that $262,000,000 would be spent during the year for new plant and equipment and maintenance materials. As if this were not enough the JOURNAL proved that electric railway costs were approaching a stabilized condition. As the stenographer wrote it receiverships were the slowest in 13 years. Slowest and lowest is right, Gertrude. More cars were ordered during 1923 than in any year since 1913, and track extension and reconstruction were the greatest in 8 years. In April along came W. H. Sawyer, president of the East St. Louis & Suburban Railway, with his optimistic paper before the Wisconsin Public Utilities Association. His remarks were truly constructive. Later on B. C. Cobb, vice-president of Hodenpyl, Hardy & Company, told how growing traffic and ample rates were helping the situation. Mr. Cobb was speaking before the Babson Institute.

James W. Welsh, executive secretary of the American Electric Railway Association, told the members of the Southwestern Public Service Association why car fares differ. He said that the speech of electric railway men was an unknown language to the car rider. Speed, wages, length of haul, density and investment all affect fares. Any one of these factors alone could more than account for existing variations in fare, but combined the wonder is not that fares range only from 5 to 10 cents, but that they do not reach far wider limits. His paper was a very valuable contribution to the subject and it was later used to good advantage in a number of places.

Let anybody who still thinks the electric railways are going to the demnition bow-wows remember that the receiver at St. Louis has piled up $4,000,000 in cash and that in Kansas City an annual deficit of $1,500,000 has been turned into a net of more than half a million. The Louisville Railway is back on a dividend-paying basis and the Brooklyn-Manhattan Transit Corporation began preferred dividend payments less than a year after its reorganization.

These are particularly juicy morsels, but they are fairly typical just the same. The Denver valuation was fixed at $23,514,769 and an 8-cent fare authorized. This is a heartening instance that fair play is assured. The special master's findings were questioned in the Denver case, but the court did not depart far from them. Along the lines of improvement in the industry, substantially better results were reported in New York City. The combined results there for the year ended June 30, 1923, show a surplus for the first time in five years; 2,577,912,855 cash fares were paid. The traffic in the city was 439 rides per capita. Invested in the rapid transit lines of New York is the vast sum of $479,000,000.

Another important development was the one in which the New York commission held that a fare advance was the only answer to the New York & Queens County Railway situation where the company was operating at a 5-cent fare and burdened with a $250,000 paving expense. In this decision the commission recognized the basic fact that, regardless of politics and politicians, the public cannot continue indefinitely to get something for nothing. Permission was granted to charge 6 cents with 1 cent additional for each $100,000 paving assessment against the company.

MUCH FROM LITTLE

It has been very largely a case of *multum in parvo* with the electric railways in recent years. Just how much can be done with little is shown in most of the cases in the competi-

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tion for the Coffin prize, won in 1924 by the Northern Texas Traction Company. This award is made to the electric railway which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well being of the public and for the benefit of the industry.

P. L. Thomson, publicity manager of the Western Electric Company, is of the opinion that "It's your own fault" if the railways are not better sold to the public. Mr. Thomson said that he could not attempt to set up a figure that would express the ratio the advertising appropriation ought to be to the gross revenue, but that railway men ought to spend enough to do the job. Three hundred street railways spent $2,000,000 last year in public relations activity. It will be more this year. He said that when a railway sets apart as one of the major objectives of its business the building of sound public relations, the executive officer in charge ought to be at least a vice-president and he ought to have competent assistants and an adequate appropriation. Similarly, Bill Strandborg of the Portland Electric Power Company, speaking before the Inland Daily Press Association, said that the way for the utilities to tell their story was to buy more space in the advertising section of the newspaper, not to beg space in the news columns.

H. G. Taylor, president of the National Association of Public Utility Commissioners and a member of the Nebraska State Railway Commission, said that anything is possible when we have to do it. Mr. Taylor said that the working of economic laws, superior efficiency in the use of the streets, intelligent sales efforts, and good use of publicity is bringing the electric railways back into their own.

OTHER CONTRIBUTIONS BY MR. WICKWIRE

One of the best contributions to this subject was the paper "Friendlyizing the Public," read by E. F. Wickwire, vice-president of the Ohio Brass Company, before the Southwest Association in April. This was a typical Wickwire contribution. Mr. Wickwire said that the utilities would be poor picking for pilferers if all directly interested would do their part. In a similarly striking way Mr. Wickwire drove home the importance of public relations work and showed how to pursue it in addresses before the new Metropolitan Community Section of A.E.R.A., New York, and before the Midwest Electric Railway Association. In April Traction Tom, a new figure in the electric railway industry, was introduced as the outgrowth of the poster series called "The Man Behind the Electric Railways." Traction Tom, speaking for the 500,000 workers in the United States who draw pay directly or indirectly from the electric railways, has given out some homely advice.

Early in the year the Pittsburgh Railways ushered in its commercial and research department, sponsored by Thomas Fitzgerald and headed by W. H. Boyce as commercial manager. New cars have been ordered for Pittsburgh, but immediate action toward bettering public relations was begun by changing fares and improving service conditions. Later Mr. Boyce told what may be accomplished by constructive publicity. As Bill indicated, even if it is street railway publicity, it is in direct competition with the advertising of Rears-Sawbuck, the United States Mail, the Well Belephone Company, jitneys, freight and passenger buses, trucks, about fourteen million autos and Fords and the Shoe leather express. Pittsburgh has put on the Sunday pass with good effect. The "Shop Between Ten and Four" signs distributed through the association have helped to remove some of the terrors of the holiday season. By keeping everlastingly at it, railway men may eventually be able to make meaningless the lines:

The melancholy days have come
The saddest of the year
The Christmas shopping women folks
Begin to reappear.

In New York the Third Avenue Railway has installed its own radio broadcasting station WEBJ. On the air Slaughter Huff, president of the company, had been known to follow Mayor Hylan speaking from WNYC. It is the battle of the air or

From Slaughter Huff to Singhi Breen
From president to singing queen
The Mayor may gulp and at times be rough
But he doesn't bother Slaughter Huff
Or G. M. Dahl for that matter.

Edward Dana of the Boston Elevated has used the radio to good advantage during the year. In Detroit it is being used to call emergency crews.

Traffic is being speeded up in downtown St. Louis by the enforcement of recent ordinances. Signs installed in the cars of the Pittsburgh Railways tell strangers how to reach their destination by railway. The Tri-City Railway put into effect a rerouting scheme.

It's a courtesy desk now on the Chicago Surface Lines, not a complaint desk. The change was suggested by the official who reads the letters received daily from passengers. He found that a constantly increasing number of them began "I wish to commend." The honor system of fare collections has speeded up passenger movement on the Beaver Valley Line and bettered public relations. Freight and passenger cars of the Indiana, Columbus & Eastern Traction Company and the Columbus, Newark & Zanesville Electric Railway have been converted into moving billboards. Cars similarly painted are being run by the Northern Ohio Traction & Light Company. Unusual terminal layout facilities at Salt Lake City on the lines of the Bamberger Electric Railroad and the Salt Lake & Utah Railroad are builders of good will. Passenger comfort is a feature of the new Chicago Rapid Transit Company cars, discussed in detail in the issue of the JOURNAL for Jan. 12. As Britton I. Budd, then president of the American Electric Railway Association and head of the Chicago Elevated, said on "Modernization," in the annual convention number:

"Public good will is the key to successful operation of a utility company. Good service is the basis of public good will."

Many of those who spoke during the year about public relations properly stressed the importance of the attitude of the employee as a point of contact. He needs all the tact of the fellow with the red nose who suggested a way out in a dispute between two ladies over the car window.

"If this window is open," one declared, "I shall catch cold and probably die."

"If the window is shut," said the other, "I shall certainly suffocate."

The two glanced at each other. Then the man with the red nose said:

"First, open the window, conductor. That will kill one. Next, shut it. That will kill the other. Then we can have peace."

Members of the New England Street Railway Club discussed employee relations at the meeting held in Boston in December. The Nashville Railway & Light Com-

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pany has scored a reduction of 25 per cent in the number of accidents since its adoption of the plan whereby trainmen profit by accident reduction. In Birmingham bonus awards and distinguished service buttons have resulted in more careful operation and fewer accidents. The Virginia Railway & Power Company was another to adopt an arrangement of this kind last year.

The subject "Modernizing Employment Methods" was discussed by Dr. A. J. Snow, in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 13. His talk was based on experience on many different lines of industry. He said that general interviews and general examinations do not give any indication of the probable reaction of a man when operating vehicles under traffic conditions. Similarly, with respect to bus operation, R. N. Graham, manager of railways of the Pennsylvania-Ohio Electric Company, said care in selecting drivers is better than education after employment.

Trainmen are not the only employees that need to be coached. W. A. Holden, superintendent of transportation of the San Antonio Public Service Company, speaking before the Southwestern Association in April, said that the supervisory force, particularly inspectors, needed to be trained. They can do more than most anybody else to improve the service. Andrew L. McDonald, member of the Wisconsin Railroad Commission, speaking before the Wisconsin Association, said that trainmen cannot make up for defects in service for which the management is responsible.

S. F. Fannon, director of the department of public service of Sherman Service, Inc., said that maintaining street railway personnel depended on explaining the company's purpose to employees and the relation of the individual to the railway.

The Cleveland men were granted a 12-cent advance by an arbitration award made in June, but the company said that the finding was not fair because of prejudice on the part of one of the members of the board. In December the men voted down an offer made by President Stanley as a means of settling all differences between the company and the union. He wanted a 5-year contract on a 60-63-65 cent basis with the present differentials. There the matter stood on Dec. 31. The Detroit Municipal Railway last May decided not to deal with the union and this matter is still before the courts for adjudication. A three-day strike in Pittsburgh was terminated on May 12 when trainmen accepted the present wage scale for two years. Four hundred miles of I. T. S. Interurban were tied up six days in December. The company accepted the closed shop, but there will be no hourly wage increase. Some of the Buffalo labor dynamiters were sent to the cooler, but the last has not yet been heard about the fate of these miscreants. Arbitrations have favored neither party, as pointed out in the compilation of arbitrations during the last five years.

INTERURBANS ARE MODERNIZING

The Interstate Public Service Company placed sleeping cars in service between Indianapolis and Louisville this fall, and the same company made rider comfort the feature of the new interurban car which it developed for intercity traffic. Similarly, a parlor car and coach built by the Milwaukee Electric Railway & Light Company have many features typical of steam railroad practice. The demand for a de luxe service has also increased in Michigan so that the Detroit United Railway has added chair cars to several of its interurban lines. And the Northern Ohio Traction & Light Company and the I. T. S. have given increased attention to the matter of passenger comfort.

The progress made in handling interurban freight in 1923 was discussed by T. H. Stoffel of the railway department of the Westinghouse Electric & Manufacturing Company early in the year. He said that in three central states material additions had been made to net revenue by handling freight. In those states alone more than 1,000 cars are now in use and loadings approximate 500 carloads. The new Indianapolis freight terminal was opened last fall. This is the largest terminal of its kind in the world. The Indianapolis & Cincinnati Traction line was changed from a.c. to d.c. and generally rehabilitated as a step looking toward extension of the line some 60 miles to reach Cincinnati.

There was "Jolla-fication" at the completion of the San Diego Electric Railway extension and the opening of the 14-mile high-speed line to Ocean Beach last July. The Chicago, North Shore & Milwaukee Railroad reported its best year in 1923. The Toledo & Western Railroad was sold to the Willys-Overland Automobile Company and the Wabash Railroad. This marked the entrance of another motor manufacturer into the field of railroading.

C. W. Snyder, vice-president of the Illinois Power & Light Corporation, appears to have summarized the interurban situation in his paper last November before the Midwest Association. He said that the interurban must introduce new services and new selling. He said that the passing out of some of the smaller and weaker roads had created a false impression about the status of the electric railway. He attributed these failures to the natural reaction from a boom building period in which some roads were built that were not justified by density of population or conditions of competition.

BUS DEVELOPMENT GOING ON APACE

All of which leads to the subject of the bus. J. A. Emery of Ford, Bacon & Davis said early in the year that co-ordinated service between trolley and bus was possible and then proceeded to prove it. Later in the year John A. Beeler contrasted coach and bus operation in New York as conducted by the Fifth Avenue Coach Company and by the buses under municipal supervision. Before the New York Electric Railway Association at Long Beach in June L. H. Palmer, general manager of the United Railways & Electric Company, Baltimore, told about the operation of the bus there as an auxiliary covering more than 5 years. The spheres of motor and railway transport were discussed at the New England conference in December. Among the electric railway men who participated with papers were W. J. Flickinger, assistant to the president the Connecticut Company; Edward Dana, general manager Boston Elevated Railway, and L. S. Storrs, president the Connecticut Company. At that meeting the expression *Cave Canem* was resurrected by Mr. Dana. His translation of this was "Beware of the Dog." He offered this motto for consideration of the bus men as the inscription over the door of the electric railway: "Beware of the bus-mile statistics."

With Mr. Dana it has evidently been a case of:

My auto, 'tis of thee
Short cut to poverty—
Of thee I chant.

But they are all doing it. Earlier in the year F. E. Belleville, auditor of the Louisville Railway, sang a

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pæan about the results of bus operation there. As for operating experience with buses, B. Hilburn, general manager of the Tulsa Street Railway, pointed out various sources of trouble in his paper before the Midwest Association in November. The Twin City Rapid Transit Company bought out its motor competitors. The United Railways, St. Louis, likewise took the bull by the horns, as it were, and entered the bus field in competition with the People's Motor Bus Company. The largest bus operator among railways is the Public Service Railway with 593 buses.

The Detroit United bought some rural bus lines. It will also operate to downtown Detroit by bus instead of bringing its interurbans into the city. Similarly the Hartford & Springfield Street Railway turned the bus to advantage. Rochester went in for a trackless trolley, as did Cohoes and one or two other places. But Rochester did even more —it established de luxe bus service on a suburban run. Buses are even being run along the historic Paul Revere route. The Department of Street Railways of Detroit developed a new double-deck bus and is running emergency bus lines as a municipal enterprise. The bus was made an ally in Decatur. In Pennsylvania the Pennsylvania-Ohio Electric Company has paralleled its interurban line with buses as a means of providing de luxe service. As a matter of fact, buses are now carrying one-quarter of the total number of passengers in Youngstown. There bus service supplements the city service by furnishing transportation facilities to the recently developed sections.

Both the Los Angeles Motor Bus Company, subsidiary of the Los Angeles Railway Corporation, and the Pacific Electric Railway ordered more double-deck buses during the year and expanded their bus services. The Michigan Railroad joined with the bus so as to increase freight and passenger facilities. Bus talk was started in Cleveland last March and wound up in the hearing at Columbus in December, at which some harsh words were passed. There has also been a lot of loose bus talk in New York. In fact, there were so many applicants for bus rights in New York at one time that track of them was lost. One count showed 51 applicants. New York's merchants, however, are not impressed with the idle talk on the part of the Mayor of taking the cars off both 42d and 125th Streets and replacing them with buses.

200 Buses for Philadelphia

By far the biggest bus order of the year is the one placed by the Philadelphia Rapid Transit Company for 200 gasoline-electric vehicles. In a lecture under the Cyrus Fogg Bracket Foundation to the students of the Green Engineering School of Princeton University, President Thomas N. McCarter of the Public Service Railway said that the electric railway and bus in co-ordination can furnish the people of this country with local transportation fitted to public needs, and the transportation system of the future will be a combination of cars and buses under the same management, each occupying the field to which it is best suited. A similar plea was made by President Shannahan of the American Electric Railway Association before the National Association of Railway & Utility Commissioners at Phoenix in November. He wants legislation which will set the motor vehicle in its proper place, on its own account and in relation to other means of transportation, as a common carrier, and on a footing with street car transportation in so far as franchises, penalties and restrictions are concerned. Co-ordination was the subject of a series of papers at the convention in Atlantic City.

Jitneys a Poor Stick for Support

In a number of cases the politicians have found the bus to be a convenient plaything. Mayor Hylan has, of course, been spouting the cause of the bus all through the year. Mayor Rybolt of Akron stole a note from the ideas of Mayor Hylan, but with disastrous results. Service was suspended in Akron on Feb. 1. The local cars were withdrawn at the expiration of the franchise following the refusal of city officials to grant a fare increase pending negotiations of the new operating contract. As the JOURNAL said at the time, Akron's ride on rubber was not resilient. The cars went back on Feb. 28. Following the suspension of railway service in Akron, the jitney men promptly appealed to the city for permission to charge a 7-cent fare, saying that they could not make expenses at 5 cents.

The jitneys were defeated at the election held on April 29 in Youngstown, Ohio. At that time the so-called jitney referendum ordinance initiated by the jitney operators was voted down. Jitneys were made a political issue at Springfield, Mass., and counsel for the jitney men ran for Mayor on an avowed platform providing for their return. He was defeated. The jitney was also an issue in the election at Springfield, Ill., on Nov. 2, but there a new railway franchise for 20 years was awarded to the Springfield Power Company under which service will be co-ordinated. There was a five-day service suspension in Port Huron, Mich., by the City Electric Railway, a subsidiary of the Detroit United Railway, in which the residents rode buses at a 10-cent fare while the City Commissioners made up their minds to accept the railway's proposal. At the election on Sept. 9 the voters confirmed the good judgment of the City Commissioners. The choice before them was: Do you prefer one-man car operation at 5 cents or two-man operation at 7 cents? The jitney ordinance of Detroit was declared unconstitutional. In this instance the court made permanent the injunction restraining the city and its officers from enforcing the ordinance. The court opinion stated that the ordinance was unreasonable from the viewpoint of public demand and general welfare in excluding jitneys from the main streets and allowing other forms of transportation to use them, and that it was not a regulation but a prohibition of jitney service which is inconsistent in view of the license granted by the ordinance. The Detroit lines were not required to retire, but out in Oakland "Rosalie" retired. Rosalie was the bus put on by the city of Oakland. She was incarcerated in the police garage to await further developments in Oakland. The retirement of "Rosalie" was forced by the refusal of the city auditor to pay the bill for her.

Expansion of the San Francisco Municipal System put the railway behind $317,929 for the year. Seattle flirted with the 5-cent fare with the result that the net income was $600,000 less than for the previous year. Chairman Jackson of the Board of Public Trustees in charge of the Boston Elevated believes the railway will go from public control to public ownership. Boston's Mayor welcomes this suggestion. The finding of the board of arbitrators, appointed in accordance with the purchase contract between the city of Detroit and the Detroit United Railway, when the city took

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over the Detroit United lines, was a most important finding.

Heavy electric traction was the subject of a discussion at the mid-winter convention of the American Institute of Electrical Engineers held in Philadelphia on Feb. 5. It was also a subject at the A. S. M. E. meeting in June. Again at the A. R. A. meeting in July the problems of heavy traction held a prominent place. In June the New Haven Railroad started 100 per cent electric operation between New York and New Haven, the use of steam engines being eliminated in the electrified zone. The Pennsylvania made a decision to equip its Fort Washington branch for single-phase operation. Mr. Ford's locomotives for use on his Detroit & Ironton Railroad are coming on. The Staten Island lines are being electrified.

MUCH DIRT, BUT NO DIGGING

Akin to heavy electric traction is rapid transit operation in cities. At the election in Detroit on Sept. 9 the voters approved a charter amendment providing for a system of rapid transit lines. A combination tube and subway is planned to connect San Francisco and Alameda. Hylan has a subway plan for New York to cost $400,000,000, but in the meantime he has spurned all overtures made by the Transit Commission looking toward even the completion of lines authorized in 1913. Plans have also been advanced during the year by Daniel L. Turner for a New York suburban transit system by which railway trains would run into New York through a union terminal distributing system, to be entirely independent of the city systems. Another Hylan idea is for a four-track trunk line to be built on Sixth Avenue to replace the "L" now there. There has been much dirt but no digging in New York. A wag who wrote to the Transit Commission expressed the situation thus:

For seven long years Hylan's dinned in our ears
What he'd do if he ever got going,
But the subways we'd get are not started yet
In spite of the "dirt" he's been throwing.

At the hearing on Dec. 24 before Judge McAvoy on transit matters Mayor Hylan complained that he was being made defendant instead of prosecuting witness.

The question of rapid transit for Chicago has been reopened by proposals from the railways considered by Mayor Dever, Mr. Blair, Mr. Insull and other officers of the companies there. Super-highways are proposed for Detroit with four-track rapid transit lines underneath them. Hollywood is to be made accessible to Los Angeles through a tunnel to be built at an outlay of $3,800,000 by the Pacific Electric Railway. Perhaps the Pacific Electric Railway will be able to lay out the subway for moving picture purposes. The year 1923 saw "Conductor 1492" in the movies and the subject of a JOURNAL editorial, "Caught Underground," may yet be enacted. John A. Beeler wants Atlanta to put in a moving sidewalk.

Even without rapid transit lines street car traffic is being speeded up. A gain of 1.85 m.p.h. in the downtown district of Detroit has been obtained largely through anti-parking regulations. At the same time accidents have been reduced. Chicago's Loop rerouting was planned so as to increase the capacity for cars 30 per cent. Parking rules were suggested by the New York State Conference of Mayors to fix drastic limits on trolley-traveled streets. Street congestion was one of the topics at the meeting of the Mid-West Association in November. Substitution of the bus for the trolley would add to traffic congestion, said John A. Miller, Jr., associate editor of the JOURNAL, in discussing a paper presented before the A. S. C. E. Along the lines of public safety, rules for pedestrians and changes of car routes were proposed in the traffic report presented in Baltimore. The Mayor's commission there recommended strict anti-parking regulations within the central business district. J. Rowland Bibbins told in the JOURNAL for Feb. 23 how the work of solving the traffic problem was being organized in some cities and gave some of the results. He said that a broader viewpoint of the whole problem was necessary. The greatest need is for leadership and the railway should supply it.

The biggest thing of the year done in the interest of relief of street and highway accidents was the national conference called by Secretary of Commerce Hoover. This conference outlined a comprehensive and constructive set of rules and regulations for guidance of all interested parties.

The doctrine of "Modernize and Merchandise" is certainly bearing fruit. Details of some of the advances that have been made have already been noted. Although, as the JOURNAL pointed out last March, 40 per cent of the machine tools in use in electric railway shops were 20 years old and only 28 per cent of all machine tools now in use have been purchased in the last 10 years, during the year some progress was noted in correcting this condition.

The new Everett shops at Boston have paved the way to maintenance economy. The Interborough has completed a new inspection shed at 180th Street, New York. New buildings are to replace the carhouse destroyed by fire last July at Grand Rapids. Detroit has recently completed new shops for its municipal line. At Toronto there are 5 acres of shop under one roof to care for cars of the municipal railway. This building is the principal one of a group so designed as to involve the minimum movement of equipment, materials and men. The arrangement provides for about 1,800 cars, including all branches of work necessary for overhauling and painting. Fort Wayne has a new carhouse.

FOREIGN OPERATION STUDIED

Forty-seven pages of the issue of the JOURNAL for Sept. 20 were given over to the report of the committee on foreign operation, made up of James W. Welsh, Harley A. Johnson and Harry L. Brown. It was a prodigious task which these men carried out. Their itinerary and the report which they presented prove this. Not only are the results of the study which the members of this committee made available in the JOURNAL, but the findings have been reprinted in pamphlet form. Aside from the elaborate report on foreign practice the JOURNAL covered at length the sessions in Paris in June and in Homburg in September of the two principal European electric railway associations and published most of the papers and reports presented at these meetings. Nearly every week "Foreign News" appeared in the department "The News of the Industry."

Reference to the report of the committee that went abroad and to the convention at Atlantic City and the exhibits was purposely left to the last. In news reporting the big event comes first, but in a review there is little need to draw attention to things that have made such a big impression themselves that they can't possibly escape attention. It is very much like the case of the fellow who was asked if he knew that the 'Steenth National Bank had busted. "Yes," he said, "I heard the report."

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Heavy Traction Has Quiet Year

Progress Is Being Made on Projects Already Started, but Little New Work Is Decided On—New Type of Single-Phase Locomotives Planned

CONDITIONS in the field of heavy electric traction have changed comparatively little during the past year. The outstanding event of the year probably was the electrification meeting of the American Institute of Electrical Engineers held at Philadelphia in February. Operating men from the principal steam railroads having electric divisions, and some few from other roads, expressed their views of what is to be expected from electric operation if it is to become interesting to the trunk lines. The discussion brought out that on the electrified division of the Norfolk & Western Railway extremely heavy freight trains are hauled by electric locomotives with an 8 per cent operating saving over steam for doing the same amount of work. Moreover, the electric locomotives can haul trains at twice the speed of the steam engines and are available for service for 85 per cent of the time as compared with 50 per cent of the time for steam engines. There is a fuel saving of 12 per cent over steam, and with favorable conditions it is estimated that the fuel saving should run as high as 25 to 30 per cent.

In connection with the A.I.E.E. meeting, the Pennsylvania Railroad had an interesting exhibit of its heaviest types of motive power, both steam and electric. It is interesting to note that what is said to be the heaviest locomotive in the world for freight service is an electric engine, weighing 250 tons and having a rating of 4,800 hp. This machine operates on the single-phase system at 11,000 volts.

Motor-Generator Locomotives for Single-Phase Lines a Radical Departure

A somewhat revolutionary announcement during the year was that of the New York, New Haven & Hartford Railroad that it has ordered seven electric locomotives of an entirely new type from the General Electric Company. These locomotives will operate on the railway's 11,000-volt, single-phase system, but, unlike the other locomotives of the New Haven, they will have motor-generator conversion equipment to change the alternating to direct current for use in d.c. traction motors. While the plan is patterned after the Ward-Leonard system brought out 30 years ago, this is one of the first installations where it is employed in actual service on a large scale.

The New Haven announcement followed only a short time after the statement that the electric locomotives for Henry Ford's road, the Detroit & Ironton, will use locomotives of nearly similar electrical characteristics to those ordered for the New Haven, although the contact line will be at 22,000 volts on the Detroit & Ironton. These locomotives will be designed by Mr. Ford's engineers and will represent his ideas. The electrical equipment will be furnished by the Westinghouse Electric & Manufacturing Company. Thus both leading electrical manufacturers are constructing locomotives of a new type different from anything else in America, but which will be quite similar electrically.

The New Haven and Ford announcements indicate that the railroad men and the manufacturers are taking a more liberal attitude than they have for a number of years past. While it will be some time before service records of these new locomotives will be available for comparison, it seems that the situation is now clearing up. Consequently a considerable impetus should be given to the cause of electrification.

During the year the New Haven road inaugurated 100 per cent electric operation of all freight and passenger trains on its main line between New York and New Haven. While this line has been electrically operated for several years, until last year there never was sufficient power to permit full electric operation, and steam was used for certain passenger and freight trains.

Construction Work on Several Electrifications Is Progressing

The Long Island Railroad began work on its Jamaica-Babylon electrification during the year. This project comprises 28 miles of line and will cost $4,000,000. It will convert one of the largest remaining sections of the system to electric operation. It permits the road to run through passenger trains between Babylon and the Pennsylvania station in New York, or Flatbush Avenue in Brooklyn, thereby eliminating the transfer of passengers at Jamaica.

The Pennsylvania Railroad extended its 11,000-volt, single-phase electrification in the Philadelphia suburban zone by converting the Fort Washington branch to electric service. This is a 6-mile line connecting with the Chestnut Hill branch.

Construction is progressing on the electrification of the Staten Island Rapid Transit lines, with some 40 miles of track. These lines eventually will be connected with the rapid transit system of New York City to give the Borough of Richmond a high-class suburban service.

Work on the electrification of the Virginian Railway has progressed during the year, and it is expected that the road will be opened for electric service during 1925. The Illinois Central suburban electrification at Chicago also is proceeding according to plans announced a year ago.

An electrification of an entirely different kind inaugurated during the year was that of the Missouri-Kansas-Texas Railroad between Dallas and Denton, Tex. This line has been equipped with an overhead trolley and the necessary 600-volt d.c. power supply. It is planned to operate passenger service in the same manner as on light interurban roads, and with light one-man cars. Through passenger and freight service will still be given by steam trains. In this way the advantages of the ordinary interurban will be obtained without the duplication of track and consequent destructive competition.

In Europe greater progress is being made in electric traction than in this country. The Swiss Federal Railways will be completely electrified in the near future. The decision to make the change is based on economic reasons, the price of coal being high while water power is cheap. The Paris-Lyons-Mediterranean Railway in France is following through an extensive electrification program that involves most of its lines in southern France. Here, too, much of the power will be supplied with hydro-electric stations.

The Southern Railway of England, which includes a number of the suburban lines operating out of London, is proceeding with its electrification, having increased the electrified route-miles from 85 to 145 and the track-miles from 248 to 358.

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Electric Railway Costs and Fares in 1924

Trend Figures Indicate a Closer Approach to Stabilization—Recession in General Construction Costs and Cost of Railway Operating Materials—Advances in Railway Wages and Fares—Discussion of Trend of Operating Costs

By Albert S. Richey
Electric Railway Engineer, Worcester, Massachusetts

WITH this issue the ELECTRIC RAILWAY JOURNAL again presents a chart and tabulation showing the trends since 1913 of five index numbers which are of some interest to electric railway operators and investors. These five indexes, of wholesale commodity prices, general construction costs, street railway operating material costs, street railway wages and street railway fares, are each on the base of 1913 = 100, and are among the twelve which comprise the Conspectus of Indexes compiled monthly by the writer and published regularly in the Financial and Corporate section of this paper. Similar charts were published in the Annual Statistical Numbers dated Jan. 6, 1923, and Jan. 5, 1924. In the current presentation the indexes have been revised and brought down to date. The average indexes for the years 1913 to 1920 inclusive, are shown in the table, with the monthly indexes from January, 1920, to date. Monthly indexes for the earlier years are included in the table in the 1924 Statistical Issue of the JOURNAL.

The methods of obtaining these indexes were described in the article accompanying the chart in the Jan. 6, 1923, issue, and these methods are still followed with one exception, that of the wage index. As noted on page 787 of the ELECTRIC RAILWAY JOURNAL for Nov. 1, 1924, the wage index has been revised by a change in the weighting used. Formerly, the maximum hourly wages of the platform men on about 100 of the larger roads of the country were weighted according to the number of passenger cars operated by the various companies. The revised index, as shown here, uses for weighting purposes the number of platform men employed, and is thus a more accurate indication of the trend of the average platform man's hourly rate of wage. The difference between the former and the revised index is very slight, owing to the necessarily fairly close relationship between the number of cars and the number of men on roads operating 100 or more cars.

In the JOURNAL'S 1924 Statistical Issue, it was stated that these indexes then indicated that electric railway costs were approaching stabilization, at least to the extent that an end could be seen to the period of rapid and large fluctuations in labor and material prices. Especially as compared with the several years preceding 1923, that statement is borne out with reference to 1924, although the year just past shows a trend which is downward in two of the indexes and slightly upward in two others. Apparently we should not yet risk any very definite prophecies with respect to the future general trend of these costs and prices.

Wholesale prices of all commodities combined, as shown by the Index of the U. S. Bureau of Labor Statistics, fluctuated less during 1924 than in the preceding year, and ended the year at almost the same level as it entered. In 1923 the maximum of this index was 159 and the minimum 150, as against 152.7 and 144.6, respectively, for 1924. These are small fluctuations compared with the rapid drop of more than 100 points from 247, the peak in May, 1920, to 145 a year later in May, 1921, or as compared with the rise of 17 points from the post-war minimum of 138 in January, 1922, to 155, six months later in July of the same year. Within the last 18 months this authoritative index of the general commodity price level has moved less than six points above or below 150, or 50 per cent above the 1913 or pre-war level. Many students of the subject have ventured to call this the stabilization point, and the experience of the year 1924 tends to confirm that opinion.

The general Construction Cost Index of the *Engineering News-Record* remained almost stationary near 220 for a year from June, 1923, through May, 1924. This was about the midpoint between the peak maximum of 273.80 in June, 1920, and the post-war minimum of 162.04 in March, 1922. After May, 1924, however, this index showed a continuing drop, reaching a minimum of 205.70 on Nov. 1, but increasing to 208.58 on Dec. 1.

The Street Railway Operating Materials Cost Index, which showed a drop of twenty points, or more than 11 per cent, in 1923, came through 1924 with a total fluctuation of less than sixteen points, or about 10 per cent, and a further net drop of seven points, or less than 5 per cent. It reached its low point since the war, 148.5, in October, standing a little lower than the general commodity price level, where it is possible it may establish itself for some time to come. This index is not one of construction costs, but is intended to apply to materials used in electric railway maintenance and operation. It does not include any labor costs which make up so large a part of the first cost of railway construction. The index does include fuel cost, at a weighting of 40 per cent of the total. While many railways purchase power, most power contracts include a coal clause which varies the price of power with the cost of coal, and it is for this reason that the cost of fuel for power is included in the index, which may therefore be taken as an index of the cost of operating materials including power cost, when the latter is purchased under a coal clause. The remaining 60 per cent of the weighting of the materials index is made up of the costs of metals, metal products, lumber and building materials. The weighting of these individual items was determined upon after a careful study of the cost of materials used by a number of railway companies in various parts of the country over a period of years.

The Index of Street Railway Wages, weighted as described above, has been rising steadily since its post-war low of 206.8 in March, 1923, reaching 216.4 at the end of 1923 and 220.8 at the end of 1924. The gain during 1924 was due in a large measure to wage increases in Massachusetts, Connecticut, Rhode Island, Chicago, Philadelphia and Buffalo. As those companies employ nearly 25 per cent of the trainmen represented

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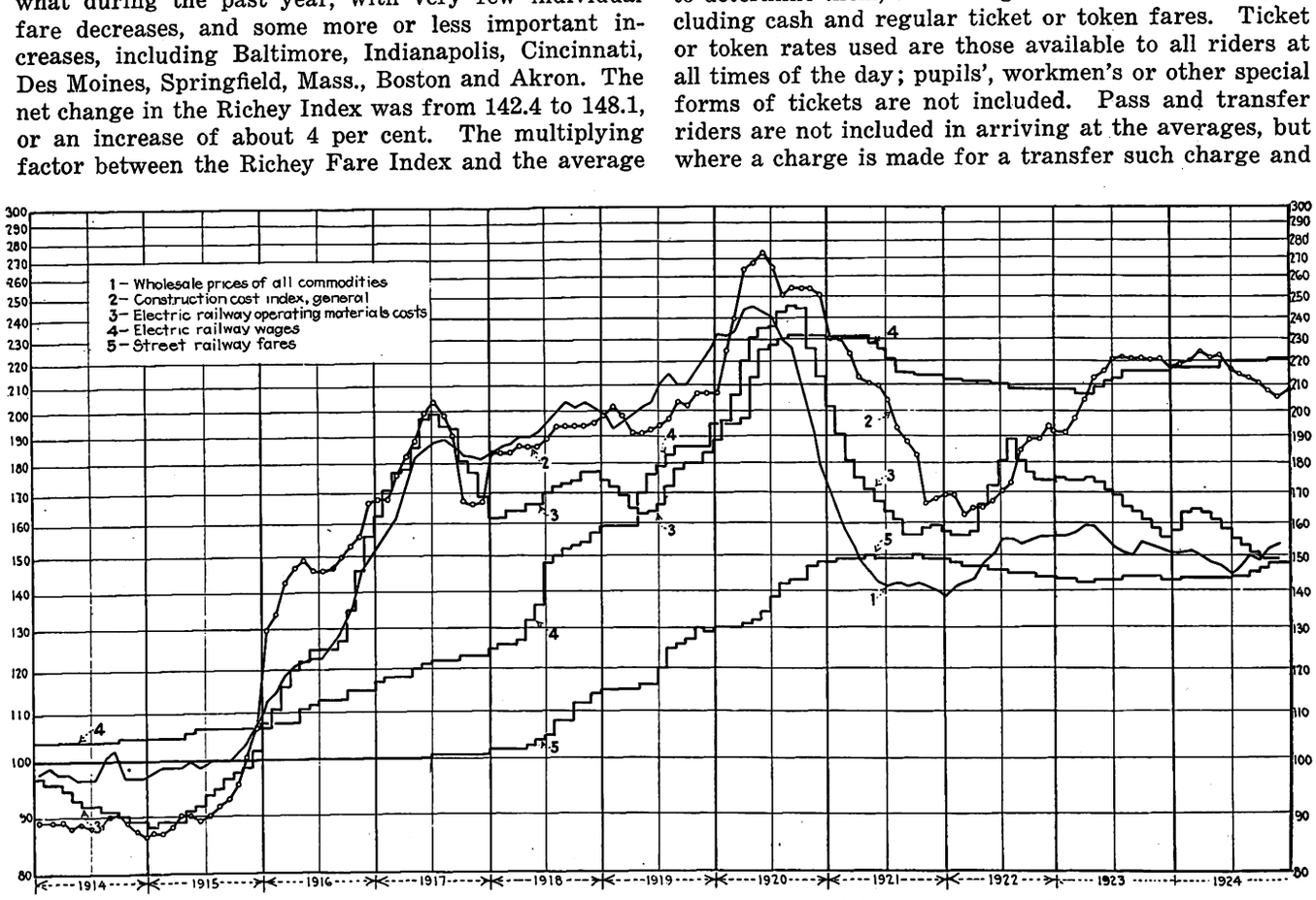
in the weighting of the index, it is not suprising that increases of from 2 to 10 cents per hour in those few companies should cause a rise of 2 per cent in the wage index. With but few exceptions other than those noted above, street railway wage contracts were renewed during 1924 at rates the same as or lower than the 1923 scales.

The Street Railway Fares Index has increased somewhat during the past year, with very few individual fare decreases, and some more or less important increases, including Baltimore, Indianapolis, Cincinnati, Des Moines, Springfield, Mass., Boston and Akron. The net change in the Richey Index was from 142.4 to 148.1, or an increase of about 4 per cent. The multiplying factor between the Richey Fare Index and the average fare in cents being 0.048425, it will be noted that the average city fare increased during the year from 6.89 cents to 7.17 cents. Here again it should be remembered that this index is not a simple average, but that it is weighted in accordance with the population of the various cities included. Those cities include all in the country of 50,000 population or more, except New York City. The fares used are, as nearly as it is possible to determine them, the average in the various cities, including cash and regular ticket or token fares. Ticket or token rates used are those available to all riders at all times of the day; pupils', workmen's or other special forms of tickets are not included. Pass and transfer riders are not included in arriving at the averages, but where a charge is made for a transfer such charge and



	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Construction Costs (*Eng. News-Rec.*)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)
1913	100	100	100	100	100
1914	98	88.6	93	104	100
1915	101	92.6	94	106	100.1
1916	127	147.4	126	112	100.1
1917	177	181.2	182	121	100.5
1918	194	189.2	169	140	106.2
1919	206	198.4	172	174	120.7
1920	226	251.3	225	217	137.2
1920					
January	233	206.6	189	195	129.9
February	232	225.1	196	195	129.9
March	234	240.9	207	195	130.2
April	245	265.2	221	197	131.1
May	247	268.9	232	213	131.9
June	243	273.8	236	226	134.0
July	241	265.7	237	228	138.0
August	231	252.0	243	231	141.5
September	226	255.2	247	232	142.6
October	211	255.2	245	232	143.3
November	196	255.3	227	232	147.0
December	179	251.6	213	232	147.5
1921					
January	170	230.9	202	231.5	148.2
February	160	230.7	191	231.4	148.6
March	155	224.3	181	231.4	148.9
April	148	213.1	175	231.3	149.1
May	145	210.8	171	228.2	149.6
June	142	209.8	167	224.6	148.9
July	141	203.8	164	221.3	149.0
August	142	193.1	161	215.5	148.7
September	141	188.3	156	215.1	148.9
October	142	182.6	156	214.3	149.6
November	141	166.3	158	214.2	148.9
December	140	167.8	159	214.0	148.6

	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Construction Costs (*Eng. News-Rec.*)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)
1922					
January	138	168.7	157	212.6	148.6
February	141	168.7	156	212.6	147.8
March	142	162.0	156	211.9	147.4
April	143	164.7	157	211.9	147.4
May	148	164.6	166	211.5	147.4
June	150	166.6	172	210.8	145.5
July	155	169.7	181	210.2	145.5
August	155	173.4	189	208.3	144.9
September	153	185.0	181	207.8	144.8
October	154	188.6	177	207.8	144.6
November	156	188.6	174	207.5	144.1
December	156	192.6	174	207.7	143.7
1923					
January	156	191.7	175	207.1	143.4
February	157	197.4	174	207.1	143.4
March	159	205.3	174	206.8	142.4
April	159	213.5	175	207.0	142.3
May	156	216.7	173	209.0	142.1
June	153	220.7	171	212.6	142.9
July	151	222.1	169	213.5	142.9
August	150	221.5	165	216.2	142.9
September	154	221.5	163	216.4	143.4
October	153	220.3	161	216.4	143.5
November	152	220.9	158	216.4	143.5
December	151	217.3	156	216.4	142.4
1924					
January	151	217.9	158	217.4	142.6
February	152	220.3	163	217.4	143.1
March	150	224.7	164	217.5	143.1
April	148	221.6	163	217.7	143.2
May	147	222.4	161	217.8	143.5
June	145	216.8	158	220.0	143.8
July	147	214.4	155	220.0	144.2
August	150	213.2	153	220.0	144.3
September	149	211.2	151	220.1	146.2
October	152	207.6	149	220.6	147.6
November	153	205.7	149	220.7	148.0
December	..	208.6	...	220.8	148.1

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the proportion of original riders paying it are considered in determining the average fare.

TREND OF OPERATING COSTS

In some instances the Richey indexes of operating material costs and of wages have been combined to arrive at a combined index of street railway operating expenses. To do this intelligently, the make-up of the two indexes must be kept in mind. The operating material cost index includes fuel for power; if power be purchased, the item of fuel does not appear in the operating costs as such, but as most power contracts include a coal clause varying the price of power with the cost of coal, the index containing coal costs is applicable to such cases as representing the trend of cost of operating materials plus power. The wage index is based on maximum hourly rates of platform men; if, as is generally the case, other employees' wages vary with those of the platform men, the index is applicable to all wages. A consideration must be made of the trend of that part of the operating expense which is neither wages nor material, such as salaries and other general office expense, advertising, accidents, etc. Sometimes the assumption is made that such "other" expense varies the same as wages and material combined. If a fair present distribution of operating expense is wages 62½ per cent, material 22½ per cent and other expense 15 per cent; if "other" expense varies as wages and material combined, and if the Richey indexes be taken as representative of the trends of wages and material costs, then the 1924 change in average street railway operating costs (exclusive of fixed charges) was as follows:

	Wages	Material	Operating Expense
Index at end of 1923.....	216.4	155.5	200.3
Index at end of 1924.....	220.8	148.7	201.6
Change during 1924.....	*2.0	†4.4	*0.7

*Per cent increase. †Per cent decrease.

Under the assumptions as above, average street railway operating expenses (not including fixed charges) in the United States at the end of 1923 were about double those of 1913; during 1924 they increased 1.3 points, or 0.7 per cent; the 4½ per cent decline in material costs was more than offset by the 2 per cent increase in labor costs.

All of the above is based on average conditions of the country as a whole; in individual sections or cities experience may show somewhat different results. It may be of some value, however, to compare individual experience with nation-wide trends and to determine the causes for such differences as may exist.

Track Extensions in 1924 Show Big Increase Over 1923

New Electric Railway Mileage Added During the Past Twelve Months Is Greater than for Many Years—Totals of Both City and Interurban Extensions Are Larger—Mileage of Track Rebuilt Is Approximately the Same as in Previous Years—Electrification of Steam Lines Has Continued

MORE miles of electric railway extensions than were made in any other one year since 1918 is the outstanding feature of track statistics for 1924. Approximately 312 miles of new electric railway track was built during the year. Of this amount about 75 per cent was city track and 25 per cent was interurban. In addition to this, 83.39 miles of steam railroad lines were electrified, making a total of nearly 400 miles of new electric trackage. The total of city and interurban extensions of electric railways, track rebuilt, and steam railroad lines electrified was greater than in any other of the last seven years.

At the same time, some 765 miles of track was reconstructed, 180 miles of this being on interurban lines and 585 miles in cities. This figure is slightly less than that for the year 1923, but is larger than that for any other past year. Figures showing the extent of track construction and reconstruction which was done by 243 different electric railway companies in the United States and Canada are given in the accompanying table.

A larger amount of new electric railway mileage was added in the Western states than in any other section of the country. In this district there were 39.098 miles of city extensions and 48.814 miles of interurban exten-

COMPARISON OF TRACK CONSTRUCTION BY YEARS

Year	No. of Companies	Extensions: Urban Track	Extensions: Interurban Track	Extensions: Electrified Steam Lines	Extensions: Total	Track Rebuilt
1907	(a)	(a)	(a)	.....	1,880.00	(a)
1908	157	1,174.5		84.00	1,258.50	(a)
1909	160	774.7		112.40	887.16	(a)
1910	217	1,204.8		192.40	1,397.20	(a)
1911	223	1,105.0		86.50	1,191.50	(a)
1912	171	869.4		80.80	950.20	(a)
1913	181	974.9		119.00	1,093.90	(a)
1914	163	716.5		229.00	946.40	(a)
1915	136	596.0		448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30	(a)
1917	121	251.10	125.60	66.00	442.70	375.40
1918	80	216.41	97.41	275.70	589.53	155.43
1919	73	110.90	29.67	287.60	428.17	390.64
1920	87	145.69	30.87	8.92	185.48	361.77
1921	78	108.15	38.95	8.08	155.18	615.21
1922	104	126.27	85.11	12.35	223.73	739.70
1923	272	169.61	63.54	26.16	259.31	854.63
1924	243	218.085	93.988	83.39	395.463	764.323

(a) Information not available.

SUMMARY OF TRACK CONSTRUCTION FOR 1924

	New England States	Eastern States	Central States	Southern States	Western States	Canada	Grand Total
Track extensions							
No. of companies..	10	18	33	10	27	14	112
Miles of urban track.....	11.386	30.191	59.526	14.508	39.098	63.376	218.085
Miles of interurban track.....	13.777	11.740	12.780	0.847	48.814	6.030	93.988
Total miles built	25.163	41.931	72.306	15.355	87.192	69.406	312.073
Track reconstruction							
No. of companies..	23	52	70	15	40	18	218
Miles of urban track.....	66.874	161.463	174.207	43.731	115.847	23.384	585.506
Miles of interurban track.....	18.827	16.370	90.662	1.000	37.348	14.610	178.817
Total miles rebuilt.....	85.701	177.833	264.869	44.731	153.195	37.994	764.323

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sions, making a total of 87.912 miles. The central states rank second in point of extensions with 72.306 miles. Canada is not far behind, with 69.406 miles of new electric railway tracks. The Eastern, New England and Southern states then follow in the order named.

In extent of track reconstruction the Central states take first place by a wide margin, with 264.869 miles. Of this, 174.207 miles was city track and 90.662 miles interurban. The Eastern states are a close second in the amount of city track rebuilt, with 161.463 miles, but are far behind on interurban. All sections of the country reported extensive track reconstruction work during the year. In Canada, however, activity along the lines was somewhat less, as only 37.994 miles of track was reconstructed.

One of the most interesting track extensions made during 1924 was the construction of the new Mission Beach line by the San Diego Electric Railway, as described in the ELECTRIC RAILWAY JOURNAL, issue of June 14. This involved the addition of nearly 19 miles of track to the system. At the same time about 3 miles of city extensions were made, so that for new track built during 1924 the San Diego Electric Railway stands first among the companies in the country.

In Philadelphia the Philadelphia Rapid Transit Company added about 11 miles of new track to its system and the Detroit United Railways constructed an almost equal amount. Other important additions were those of

ELECTRIFIED STEAM LINES

	Extensions, Miles
Baltimore & Ohio R.R.	40.00
Norfolk & Western Ry.	7.83
Montreal & Southern Counties Ry.	1.30
New York Central R.R.	0.63
New York, New Haven & Hartford R.R.	0.15
Texas Interurban Ry.	33.48
Total	83.39

Track Built and Rebuilt During 1924

Name of Railway	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, Miles City	Rebuilt, Miles Interurban
Connecticut				
Connecticut Company	0.60	0.039	14.59	5.04
Danbury & Bethel St. Ry.	.....	.....	0.25	.....
Maine				
Androscoggin & Kennebec Ry.	.....	.....	6.00	.....
Bangor Ry. & Electric Co.	.....	.....	0.38	.....
Biddeford & Saco R.R.	.....	.....	0.51	.....
Cumberland County Pwr. & Lt. Co.	.....	.....	1.68	.....
Portland-Lewiston Interurban R.R.	.....	0.08	.....	.....
Massachusetts				
Berkshire St. Railway	.....	0.141	1.787	3.527
Boston Elevated Ry.	4.34	.....	17.00	.....
Eastern Mass. Street Ry.	0.61	.....	9.92	1.83
East Taunton St. Ry.	5.00	6.00	.....	.....
Holyoke St. Railway	.....	.....	0.90	.....
Massachusetts Northeastern St.Ry.	.....	.....	0.25	1.00
Middlesex & Boston St. Ry.	.....	.....	3.94	.....
Millford & Uxbridge St. Ry.	.....	.....	.....	5.00
Plymouth & Brockton St. Ry.	.....	.....	1.00	.....
Springfield St. Ry.	.....	0.017	0.19	1.82
Union Street Ry.	.....	.....	2.00	.....
Worcester Consolidated St. Ry.	0.49	.....	0.64	0.11
New Hampshire				
Berlin Street Railway	.....	.....	0.18	.....
Chester & Derry R.R.	.....	7.50	.....	.....
Laconia Street Railway	.....	.....	1.00	.....
Manchester Street Railway	.....	.....	1.10	.....
Rhode Island				
Newport & Providence Railway	.....	.....	1.00	.....
United Electric Railways	0.346	.....	2.494	.....
Vermont				
Springfield Railway	.....	.....	.063	.50
Total	11.386	13.777	66.874	18.827
District of Columbia				
Capital Traction Co.	.....	.....	0.521	.....
			1.50	
Washington Railway & Electric Co.	.....	.....	1.38	2.37
Maryland				
Potomac Edison Co.	.....	.....	0.13	.....
Potomac Public Service Co.	.....	.....	1.67	.....
United Railways & Electric Co.	0.86	.....	17.00	.....
New Jersey				
Coast Cities Ry.	.....	.....	1.00	.....
Five Mile Beach Electric Ry.	.....	.....	4.00	.....
Morris County Traction Co.	.....	.....	.....	0.79
Trenton & Mercer County Traction Corp.	0.55	.....	2.04	.....
New York				
Auburn & Syracuse Elec. R.R.	.....	.....	0.35	.....
Brooklyn City Railroad	.....	.....	6.65	.....
Brooklyn-Manhattan Transit Corp.	8.311	.....	6.479	.....
Empire State Railroad	.....	.....	.....	4.33
Fonda, Johnstown & Gloversville R.R.	.....	.....	0.78	.....
Hamburg Ry.	.....	.....	1.00	.....
Interborough Rapid Transit Co.	3.41	.....	.....	.....
International Railway	.....	.....	5.027	.....
Kingston Consolidated Railway	.....	.....	0.20	.....
Mazara Junction Ry.	0.142	.....	.....	.....
New York & Harlem Railroad	.....	.....	1.40	.....
NewYork & Long Island Traction Co.	.....	.....	0.54	.....
New York & Queens County Ry.	.....	.....	1,138	.....
New York State Rys.	0.48	.....	7.47	.....
New York, Westchester & Boston Ry.	0.044	.....	.....	.....
Poughkeepsie & Wappingers Falls Ry.	.....	.....	1.00	.....
Richmond Lt. & R.R.	0.05	.....	4.10	.....
Rochester, Lockport & Buffalo R.R.	.....	.....	.....	0.40
Rochester & Syracuse R.R.	.....	.....	.....	0.50
Schenectady Railway	.....	.....	2.10	.....
Third Avenue Ry. System	0.145	.....	13.486	.....
United Traction Co.	.....	.....	6.663	.....
Pennsylvania				
Alleghany Valley St. Ry.	.....	.....	0.60	.....
Altoona & Logan Valley Elec. Ry.	0.26	.....	2.09	.....
Bangor-Nazareth Transit Co.	.....	.....	1.00	.....
Chambersburg, Greencastle & Waynesboro St. Ry.	.....	.....	0.30	.....
Erie Railways	.....	.....	0.45	.....
Harrisburg Railways	0.52	.....	3.66	.....
Hershey Transit Co.	.....	.....	15.00	.....
Irwin-Herminie Traction Co.	.....	.....	0.50	.....
Lackawanna & WyomingValley R.R.	0.22	.....	.....	.....
Lehigh Traction Co.	.....	.....	0.75	.....
Philadelphia Rapid Transit Co.	11.412	.....	24.318	.....
Reading Transit & Light Co.	3.10	.....	3.80	1.20
Scranton Railway	.....	.....	2.16	1.10
Shamokin & Mt.Carmel Transit Co.	.....	.....	.....	5.00
Southern Cambria Railway	.....	.....	0.50	.....
Trenton, Bristol & Philadelphia St. Ry.	.....	.....	.....	0.50
West Penn. Rys.	.....	.....	3.01	.....
Wilkes-Barre & Hazleton Ry.	.....	.....	.....	0.18
York Railways	0.43	0.13	1.40	.....
Virginia				
Danville Traction & Pwr. Co.	.....	.....	0.47	.....
Newport News & Hampton Ry.	.....	.....	0.08	.....
Virginia Railway & Pwr. Co.	0.257	.....	2.31	.....
West Virginia				
Monongahela, West Penn. Public Service Co.	.....	0.19	0.56	.....
Princeton Power Co.	.....	.....	2.02	.....
Tygarts Valley Traction Co.	.....	.....	4.00	.....
Tyler Traction Co.	.....	11.42	.....	.....
Total	30.191	11.740	161.463	16.370
Illinois				
Aurora, Elgin & Fox River Elec. Co.	.....	.....	.....	4.17
Chicago & Joliet Electric Ry.	0.32	.....	0.25	2.01
Chicago North Shore & Milwaukee R.R.	.....	5.30	.....	10.00
Chicago Rapid Transit Co.	.....	.....	20.30	.....
Chicago Surface Lines	8.18	.....	11.02	.....
Chicago & West Towns Ry.	.....	.....	1.25	.....
East St. Louis & Suburban Ry.	.....	.....	5.35	.....
Evanston Railway	.....	.....	2.00	.....
Illinois Central Electric Ry.	.....	0.18	.....	0.80
Ill. Power & Light Corp.	.....	.....	0.70	.....
Pekin Municipal Ry.	.....	.....	2.00	.....
Rockford & Interurban Ry.	.....	.....	1.528	0.234
Sterling, Dixon & Eastern Elec. Ry.	.....	0.07	.....	.....
Indiana				
Chicago, South Bend & Northern Ind. Ry.	.....	.....	1.80	.....
Indiana Service Corp.	1.89	.....	6.85	.....
Interstate Public Service Co.	.....	.....	0.60	0.61
Northern Indiana Power Co.	.....	.....	0.80	.....
Southern Indiana Gas & Elec. Co.	0.753	0.07	0.561	.....
Union Trac. Co. of Ind.	.....	0.25	0.46	1.52
Iowa				
Clinton Street Ry.	.....	.....	0.54	.....
Des Moines City Ry.	4.20	.....	1.40	.....
Dubuque Electric Co.	.....	.....	1.00	.....
Keokuk Electric Co.	.....	.....	0.60	.....
Mississippi Valley Electric Co.	.....	.....	0.30	.....
Sioux City Service Co.	0.30	.....	1.00	.....
Tri-City Ry.	0.87	0.34	5.29	.....

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Track Built and Rebuilt During 1924 (Concluded)

Name of Railway	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, City	Rebuilt, Miles, Interurban
Kentucky				
Cincinnati, Newport & Covington Ry.	.....	.....	1.00	.....
Kentucky Traction & Terminal Co.	0.70	.....	.....	.....
Louisville Ry.	1.556	.....	4.526	0.45
Mayville Street Railroad	.....	.....	0.50	.....
Paducah Railway Co., Inc.	.....	.....	0.30	.....
Michigan				
City of Detroit—Dept. of Street Rys.	7.817	.....	3.066	.....
Detroit United Railway	4.90	6.13	1.82	.....
Grand Rapids Railway	0.815	.....	0.649	.....
Marquette City Railway	.....	.....	0.88	.....
Menominee & Marinette Lt. & Trac. Co.	.....	.....	0.459	.....
Muskegon Traction & Lighting Co.	0.289	.....	0.207	.....
Saginaw Transit Co.	.....	.....	3.70	.....
Minnesota				
Duluth Street Railway	2.03	.....	2.00	.....
Twin-City Rapid Transit Co.	3.60	.....	16.23	.....
Missouri				
Cape Girardeau-Jackson Interurban Ry.	.....	.....	0.50	.....
Kansas City, Lawrence & Topeka Elec. R.R.	.....	.....	.....	0.11
Kansas City Railways	2.019	.....	7.197	.....
Missouri & Kansas Ry.	.....	.....	1.00	.....
Springfield Traction Co.	.....	.....	0.31	.....
St. Joseph Ry., Lt., Ht. & Pwr. Co.	0.32	.....	1.23	.....
United Railways Company of St. Louis	1.33	0.12	12.34	7.00
Ohio				
Cincinnati & Dayton Traction Co.	.....	.....	.....	6.00
City of Ashtabula	.....	.....	0.18	.....
Cincinnati Traction Co.	10.12	.....	4.00	.....
Cleveland Railway	1.23	.....	11.28	.....
Columbus, Delaware & Marion Elec. Co.	.....	0.32	.....	.....
Columbus, Newark & Zanesville Elec. Ry.	.....	.....	1.00	.....
Community Traction Co.	1.15	.....	1.27	.....
Dayton, Covington & Piqua Traction Co.	.....	.....	.....	1.00
Dayton, Springfield & Xenia Southern Ry.	.....	.....	.....	0.19
Lake Shore Elec. Ry.	.....	.....	.....	0.56
Lancaster Traction & Power Co.	.....	.....	2.27	.....
Lima City Street Railway	.....	.....	1.88	.....
Lima Toledo Railroad	0.34	.....	.....	.....
Northern Ohio Traction & Lt. Co.	.....	.....	4.00	4.00
Ohio Public Service Co.	.....	.....	0.17	50.08
Ohio River Electric Railway	.....	.....	5.00	.....
Pennsylvania-Ohio Electric Co.	0.677	.....	2.24	.....
People's Railway	0.061	.....	1.10	.....
Springfield Ry. Co.	.....	.....	0.449	.....
Springfield & Xenia Railway	.....	.....	.....	1.00
Stark Electric Railroad	.....	.....	0.75	.....
Wisconsin				
Lake Superior District Pwr. Co.	0.50	.....	.....	.....
Madison Railways	0.18	.....	0.38	.....
Milwaukee Elec. Ry. & Lt. Co.	2.679	.....	10.475	0.928
Wisconsin Power & Light Co.	.....	.....	2.46	.....
Wisconsin Public Service Corp.	.....	.....	0.50	.....
Wisconsin Ry., Lt. & Pwr. Co.	0.70	.....	0.78	.....
Wisconsin Valley Elec. Co.	.....	.....	0.51	.....
Totals	59.526	12.780	174.207	90.662
Alabama				
Alabama Power Co.	0.30	.....	0.90	.....
Birmingham Electric Co.	1.661	.....	10.979	.....
Mobile Light & Railroad	.....	.....	1.192	.....
Arkansas				
Arkansas Central Power Co.	2.40	.....	1.19	.....
Hot Springs St. Railway	.....	.....	1.22	.....
Florida				
Jacksonville Traction Co.	.....	.....	0.38	.....
Pensacola Elec. Co.	.....	0.66	.....	.....
Georgia				
Georgia Railway & Pwr. Co.	2.583	0.187	6.818	.....
Macon Ry. & Light Co.	.....	.....	0.20	.....
Louisiana				
Baton Rouge Electric Co.	3.26	.....	3.02	.....
New Orleans Public Service, Inc.	2.20	.....	14.20	.....
Shreveport Railways	0.74	.....	0.83	.....
Mississippi				
Laurel Light & Railway Co.	.....	.....	1.00	.....
North Carolina				
Durham Public Service Co.	.....	.....	0.80	.....
Southern Public Utilities Co.	0.75	.....	.....	.....
Tennessee				
Knoxville Power & Light Co.	0.614	.....	1.002	.....
Union Traction Co.	.....	.....	.....	1.00
Totals	14.508	0.847	43.731	1.00
Arizona				
Tuscon Rapid Transit Co.	.....	.....	0.51	.....
California				
Key System Transit Co.	1.65	0.66	8.00	.....
Los Angeles Railway	3.56	.....	20.13	.....
Market Street Railway	.....	.....	5.491	.....
Munic. Ry. of San Francisco	4.73	.....	.....	.....
Pacific Electric Ry.	2.15	8.29	3.51	11.85
Pacific Gas & Electric Co.	.....	.....	5.16	.....
Peninsular Ry.	.....	.....	0.61	1.08
Petuluma & Santa Rosa R.R.	.....	0.65	.....	.....
Sacramento & Northern Railroad	.....	0.42	.....	.....
San Diego & Arizona Ry.	.....	.....	.....	0.848
San Diego Electric Railway	3.248	18.891	5.468	2.673
San Francisco, Napa & Calestoga Ry.	.....	.....	0.34	12.00
Santa Barbara & Suburban Railway	.....	.....	0.28	.....
Colorado				
Denver & Intermountain R.R.	.....	2.217	4.047	.....
Denver Tramway	0.698	0.206	8.225	1.747
Grand River Valley Ry.	.....	5.50	.....	.....
Southern Colorado Power Co.	.....	.....	0.917	.....
			0.565	
Kansas				
Kansas Electric Power Co.	.....	.....	1.00	.....
Salina Street Ry.	.....	.....	2.00	.....
Hutchinson Interurban Ry.	.....	.....	1.00	.....
Montana				
Butte Electric Railway	0.06	.....	0.16	.....
Helena Light & Railway Co.	.....	0.42	0.50	0.15
Missoula Street Railway	.....	.....	0.34	.....
Montana Power Co.	1.32	.....	0.48	.....
Nebraska				
Omaha & Council Bluffs St. Ry.	.....	.....	10.00	.....
New Mexico				
City Electric Co.	.....	.....	3.00	.....
North Dakota				
Northern States Power Co.	.....	.....	0.34	.....
Texas				
Abilene Traction Co.	.....	.....	0.50	.....
Bryan-College Traction Co.	.....	0.25	.....	4.00
Dallas Railway	4.65	.....	1.53	.....
El Paso Electric Railway	0.64	.....	0.61	.....
Galveston Electric Co.	.....	.....	1.00	.....
Houston Electric Co.	1.88	.....	5.73	.....
Northern Texas Traction Co.	4.647	.....	4.87	.....
San Antonio Public Service Co.	3.605	.....	0.189	.....
Texas Electric Railway	0.71	.....	2.46	.....
Texas Interurban Railway	.....	4.11	.....	.....
Utah				
Utah Light & Traction Co.	.....	.....	1.13	.....
Washington				
Grays Harbor Ry. & Lt. Co.	0.25	.....	0.50	.....
Pacific Northwest Trac. Co.	4.94	.....	.....	.....
Puget Sound International Ry. & Power Co.	.....	.....	1.619	3.00
Puget Sound Elec. Ry.	.....	.....	0.44	.....
Seattle Munic. St. Ry.	0.34	.....	13.007	.....
Walla Walla Valley Ry.	.....	7.05	.....	.....
Willapas Electric Co.	0.02	.....	0.19	.....
Yakima Valley Transportation Co.	.....	0.15	.....	.....
Totals	39.098	48.814	115.847	37.348
Manitoba				
Winnipeg Elec. Ry.	2.21	1.32	1.12	1.08
New Brunswick				
New Brunswick Power Co.	0.34	.....	1.09	.....
Nova Scotia				
Cape Breton Electric Co.	.....	.....	0.25	.....
Ontario				
Brantford Munic. Railway	35.00	.....	.....	.....
Dominion Power & Transmission Co.	.....	.....	0.30	0.07
Ft. William Electric Ry.	0.50	.....	.....	2.50
Hydro Electric Railways	0.52	0.55	0.25	1.50
International Transit Co.	3.39	.....	.....	.....
Kitchener & Waterloo St. Ry.	0.30	.....	.....	2.25
Ottawa Electric Ry.	1.50	.....	.....	.....
Peterboro Radial Ry.	.....	.....	0.44	.....
Toronto Transportation Commission	10.006	.....	1.994	.....
Windsor, Essex & Lake Shore Rapid Ry.	.....	0.75	.....	1.50
Quebec				
Hull Electric Co.	.....	.....	0.25	2.80
Levis County Railway	.....	.....	0.15	.....
Montreal & Southern Counties Ry.	0.13	1.64	0.26	.....
Montreal Tramways	6.34	1.77	15.11	2.91
Quebec Railway, Light & Power Co.	2.93	.....	0.94	.....
Saskatchewan				
Regina Munic. Railway	.....	.....	0.20	.....
Sherbrooke Ry. & Power Co.	0.21	.....	0.24	.....
Alberta				
Lethbridge Munic. St. Ry.	.....	.....	0.79	.....
Totals	63.376	6.030	23.384	14.610

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the Cincinnati Traction Company and the Toronto Transportation Commission. Each of these was approximately 10 miles in extent.

Among the railways which have done extensive reconstruction of city track during the past year are the Twin City Rapid Transit Company, Minneapolis; United Railways, St. Louis; Birmingham Electric Company, New Orleans Public Service, Inc., Seattle Municipal Railway and the Montreal Tramways. Each of these companies rebuilt more than 10 miles of track during the year. Many other railways did smaller amounts of city track reconstruction. Of the total of 764 miles of track rebuilt in 1924, 585 miles, or more than 75 per cent, was on city lines.

Extensive reconstruction of interurban track was done by the Pacific Electric Railway and the San Francisco, Napa & Calistoga Railway. Other companies also did considerable amounts of this work during the year. The total trackage involved, however, amounted to only about 178 miles.

Electric railway trackage partially abandoned in 1924 was slightly larger than in 1923, the total last year being 258 miles as compared with 240 the preceding year. City abandonments increased somewhat, while the mileage of interurban abandonments decreased.

Only one abandonment was of sufficient extent to be of general interest—that of the Middlesex & Boston Street Railway. This company suspended railway service on 27 miles of track and inaugurated bus service to care for the transportation needs of several suburban towns, as told in the ELECTRIC RAILWAY JOURNAL in the issue of Dec. 6.

Abandonments—Partial—1924

Includes All Pieces of Track Sidings, Yard, Etc., Permanently Abandoned—Companies Arranged Alphabetically by States

	City	Interurban
Connecticut		
Connecticut Company	3.651	0.384
Hartford & Springfield St. Ry	.....	2.30
Maine		
York Utilities Co.	.....	16.02
Massachusetts		
Berkshire St. Railway	.....	9.201
Boston Elevated Railway	8.01	.....
Eastern Mass. St. Ry	4.08	3.63
Massachusetts Northeastern St. Ry	.....	6.22
Middlesex & Boston St. Ry	27.46	.....
New Hampshire		
Portsmouth Electric Railway	1.31	.....
Rhode Island		
United Electric Railways	2.00	.....
Maryland		
United Railways and Electric Co	0.50	.....
New Jersey		
Five Mile Beach Electric Railway	0.09	.....
New York		
Geneva, Seneca Falls & Auburn R.R	0.20	.....
Interborough Rapid Transit Co	1.63	.....
New York & Harlem Railroad	0.04	.....
New York & Long Island Traction Co	2.097	.....
Rochester, Lockport & Buffalo R.R	.....	0.93
Third Ave. Ry. System	7.299	.....
United Traction Co	.....	0.03
New York, New Haven & Hartford R.R	0.015	.....
New York State Railways	0.74	.....
Niagara Junction Ry	0.015	.....
Peekskill Lighting and Railroad Co	3.38	.....
Pennsylvania		
Altoona & Logan Valley Electric Ry	.....	0.24
Jefferson Traction Co	.....	6.00
Northumberland County Ry	2.00	.....
Pennsylvania & Maryland St. Ry	.....	4.00
Philadelphia Rapid Transit Co	1.735	.....
Pittsburg County Ry	0.45	.....
Scranton Railway	3.00	8.20
United Traction St. Railway	.....	0.50
Valley Railways	3.00	.....
West Penn. Railways	0.50	.....
York Railways	0.40	.....
Virginia		
Newport News & Hampton Ry. Gas & Elec. Co	.....	1.90
Virginia Ry. & Power Co	0.88	.....
West Virginia		
Monongahela West Penn. Public Service Co	.....	0.03
Princeton Power Co	0.22	.....
Illinois		
Chicago Surface Lines	0.27	.....
Chicago & Joliet Electric Ry	.....	1.89
East St. Louis & Suburban Ry	3.00	0.02
Ill. Power & Light Corp	1.06	.....
Sterling Dixon & Eastern Elec. Ry	.....	0.02
Indiana		
Indiana, Columbus & Eastern Trac. Co	.....	6.42
Iowa		
Keokuk Electric Co	0.90	.....
Tri-City Railway Company	5.23	.....
Waterloo, Cedar Falls & Nor. Ry	0.20	.....
Michigan		
City of Detroit—Department St. Rys	9.0048	.....
Grand Rapids Railway	0.637	.....
Menominee & Marinette Lt. & Traction Co	0.214	.....
Muskegon Traction & Lighting Company	0.453	.....
Saginaw Transit Co	0.77	5.40
Missouri		
United Railways Co. of St. Louis	0.01	.....
Ohio		
Cincinnati Traction Co	1.45	.....
Cleveland Railway	0.584	.....
Community Traction Co	5.62	.....
Lima City Street Railway	0.30	.....
Pennsylvania-Ohio Electric Co	1.58	.....
Wisconsin		
Milwaukee Elec. Ry. & Lt. Co	0.839	.....
Wisconsin Power & Light Co	.....	8.25
Wisconsin Ry., Lt. & Power Co	0.67	.....
Kentucky		
Louisville Ry	1.959	.....
Alabama		
Alabama Power Company	0.52	.....
Birmingham Elec. Co	7.706	.....
Mobile Light & Railroad	3.69	.....
Arkansas		
Arkansas Central Power Co	0.19	.....
Florida		
Pensacola Electric Co	.....	0.60
Georgia		
Georgia Railway & Power Co	1.718	.....
Louisiana		
New Orleans Public Service, Inc	4.11	.....
Tennessee		
Knoxville Power & Light Co	0.276	.....
California		
Key System Traction Co	1.60	.....
Market Street Railway	0.010	.....
Pacific Electric Railway	3.43	1.20
San Diego Electric Railway	4.736	2.437
San Francisco-Sacramento Railroad	.....	10.50
Colorado		
Denver Tramway	1.592	.001
Southern Colorado Power Co	0.955	.....
Idaho		
Boise Valley Traction Co	2.26	.....
Kansas		
Hutchinson Interurban Ry	.50	.....
Montana		
Helena Light & Railway	0.12	1.21
Texas		
Dallas Ry	0.932	.....
El Paso Electric Railway	0.24	.....
Northern Texas Trac. Co	0.348	.....
San Antonio Public Service Co	4.387	.....
Washington		
Pacific Traction Co	2.57	.....
Puget Sound International Ry. & Power Co	0.327	.....
Seattle Munic. Ry	0.94	.....
Tacoma Ry. & Power Co	1.29	.....
Canada		
Fort William Electric Ry	0.50	.....
Hydro Electric Power Commission	0.16	.....
Lethbridge Munic. St. Railway	0.71	.....
Montreal Tramways	1.06	.....
St. Johns Electric Company	2.1	.....
Toronto Transportation Commission	2.490	.....
Winnipeg Electric Co	.....	0.416
Totals	160.919	97.949

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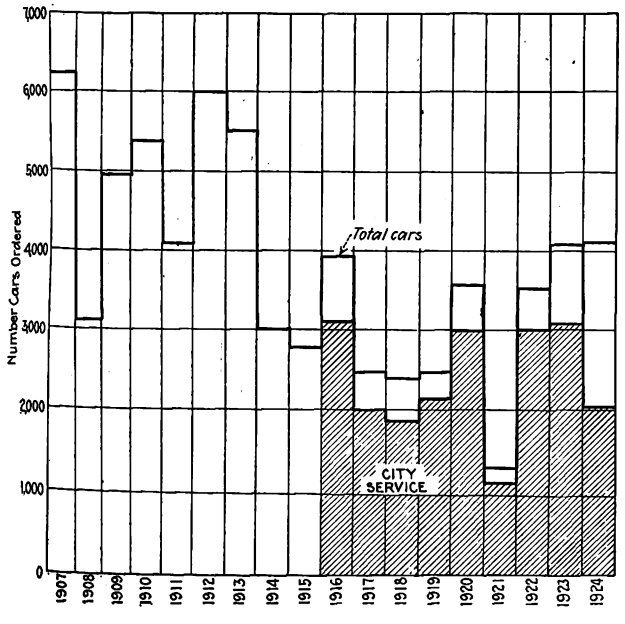
Car Orders Exceed High Level of 1923

Number of Passenger Cars Ordered for Interurban Service Highest Since 1913 — Fewer Passenger Cars Ordered for City Service—One-Man, Two-Man Cars Constitute More than 60 per Cent of Total Cars Ordered for City Service

THE high level of purchases of electric railway rolling stock which began in 1920 was again exceeded during last year. This is shown by the statistics for new cars ordered during 1924 as given in the accompanying tables. While there was a marked recession in orders during 1921, which marked the low level, a large increase in buying began in 1922, and this was exceeded during 1923 and 1924. The total of 4,092 cars and locomotives ordered during 1924 is not only slightly greater than last year but it exceeds any previous year since 1913. The maintaining of this high level shows that stability has again been established in the industry and that confidence has been restored. This augurs well for the future.

The analysis in Table V of various types of cars ordered shows in a very striking manner that the one-man,



New Cars and Locomotives Ordered by Years. The Division Into City and Interurban Cars Is Not Made Prior to 1916

two-man cars are most popular. A total of 1,262 cars of the one-man, two-man type were purchased during the past year. Of these, 1,224 were for city service and 38 for interurban service. The orders for this type of car for city service are thus seen to constitute more than 60 per cent of the total for this class of service. Purchases of one-man single-truck cars with 28-ft. body were but 103—the lowest since this type of car came into popularity in 1916. The number of one-man cars purchased with bodies larger than 28 ft. included 28 single-truck cars and 68 double-truck cars for city service and 9 single-truck and 52 double-truck for interurban service. The number of cars ordered for straight two-man operation shows a decided decrease, there being but 279 of these for city service and 100 for interurban service. It is evident that development of the one-man, two-man type of car is rapidly causing it to replace the straight two-man car.

A comparison of the various figures for passenger cars ordered during 1924 with similar ones for 1923 further demonstrates the swing toward cars for one-man, two-man operation. The totals for all other types of cars purchased show a decrease, while the one-man, two-man type has increased from 1,114 to 1,262. The total of all types of one-man cars for 1924 is 260, as

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

Year	Passenger Cars—City	Passenger Cars—Interurban	Freight and Miscellaneous Cars	Electric Locomotives	Total
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	505	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276
1922	2,912	187	405	34	3,538
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092

(a) Included in "Freight and Miscellaneous Cars."

compared with 551 for 1923. The number ordered during the past year is thus seen to be less than half of that of the previous year.

A comparison of figures for the length, seating capacity and weight of cars ordered during 1924 shows that they have remained about the same as for 1923. The preponderance of orders is for light-weight, double-

TABLE II—SPECIAL COMPARISON OF NEW ROLLING STOCK ORDERS BY YEARS

	1924	1923	1922	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars	119	167	145	94	172	160	140	182	250
City Service									
Number of one-man cars (28-ft. body S. T.)	103	312	772	565	1,699	1,383	644	280	187
Number of one-man cars other than 28-ft. body	96	183	227	....	....	....	....	....	....
Number of one-man, two-man cars	1,224	1,076	471	....	....	....	....	....	....
Number of two-man passenger motor cars*	537	1,097	1,290	383	847	635	1,068	1,316	2,731
Number of passenger trailers	25	247	150	111	343	111	130	402	128
Service cars	44	121	103	47	104	31	(a)	(a)	(a)
Total cars city service	2,029	3,036	3,015	1,106	2,993	2,160	1,842	1,998	3,046
Interurban Service									
Number of one-man cars	61	56	40	....	....	....	....	....	....
Number of one-man, two-man cars	38	38	9	....	....	....	....	....	....
Number of two-man motor cars*	435	330	122	103	195	96	200	158	303
Number of passenger trailers	4	3	16	26	32	32	55	27	71
Number of freight, express and miscellaneous cars	1,494	474	302	34	361	141	(a)	(a)	(a)
Total cars interurban service	2,032	901	489	163	588	269	255	185	374
Total number of cars	4,061	3,937	3,538	1,269	3,581	2,429	2,375	2,406	3,911
Number of electric locomotives	31	92	34	7	17	18	44	49	31

*Includes motor and trail cars for subway, elevated and train service
(a) Not available.

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truck cars. Nearly all of the cars with double trucks are equipped with four motors. This is in line with the practice established in recent years of using quadruple motor equipments with small diameter wheels.

There were 16 electric railways that ordered 50 or more cars during 1924, the same number as for 1923. Of these, the Brooklyn City Railroad ordered 335 one-man, two-man cars, the Pittsburgh Railways 125 one-man, two-man and 100 two-man cars, the Illinois Central Railroad ordered 130 motor cars and 85 trailers for train operation, the Interborough Rapid Transit Company 150 motor cars for train operation and the Los Angeles Railway 121 one-man, two-man cars. Orders for 100 cars each were placed by the Philadelphia Rapid Transit Company and the Chicago Surface Lines for one-man, two-man types. The Chicago Rapid Transit Company also ordered 100 cars for train operation. In addition to these railways, the Baltimore & Ohio Railroad ordered 80 passenger cars for train operation on the Staten Island Rapid Transit lines,

Table III—Details of Rolling Stock Ordered During 1924

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
New England States											
Connecticut											
New York, New Haven & Hartford R.R.	3	Passenger	Interurban	Motor	Double	Two	71—11	106	87.75	4	
	10	Passenger	Interurban	Motor	Double	Two	72— 7½	80	60.00	2	
Maine											
Fairfield & Shawmat Ry.	2	Passenger	Interurban	Motor	Single	Two	.....	60	.....	2	
Somerset Traction Co.	1	Passenger	Interurban	Motor	Single	One	30—0	32	.....	2	
Massachusetts											
Boston Elevated Ry.	56	Passenger	City	Motor	Double	Both	45— 0	44	15.70	4	
	8	Passenger	City	Motor	Double	Train	47— 3	48	22.00	4	
Eastern Massachusetts St. Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84 CM
East Taunton St. Ry.	4	Passenger	Interurban	Motor	Double	One	40— 0	36	23.00	4	
Massachusetts Northeastern St. Ry.	5	Passenger	City	Motor	Double	Both	41— 4½	44	17.12	4	
Worcester Consolidated Street Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
New Hampshire											
Chester & Derry R.R.	1	Sweeper	Interurban	Motor	.....	.....	.....	.....	.....	.....	
Nashua St. Ry.	2	Passenger	City	Motor	Single	One	28— 0	33	8.00	2	
Rhode Island											
United Electric Railways	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	235 STM
Vermont											
Springfield Terminal Ry. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
Total cars New England States	92										
Eastern States											
District of Columbia											
Washington Railway & Electric Co.	6	Passenger	City	Motor	Double	Two	42— 3	44	20.90	4	
	4	Passenger	City	Motor	Double	Two	42— 3	44	19.27	2	
Maryland											
Baltimore & Ohio R.R.	80	Passenger	Interurban	Motor	Double	Train	67— 0	71	47.50	2	
New Jersey											
Coast Cities Ry. Co.	7	Passenger	City	Motor	Double	Both	40— 0	40	16.00	4	
	6	Passenger	City	Motor	Single	One	28— 0½	32	8.20	2	
Five Mile Beach Electric Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
Morris County Traction Co.	10	Passenger	Interurban	Motor	Double	One	41—10	48	16.00	4	
Trenton & Mercer County Traction Co.	20	Passenger	City	Motor	Double	Both	45— 0	48	17.24	4	
New York											
Brooklyn-Manhattan Transit Corp.	4*	Passenger	City	Both	Four	Two	137— 0	160	.....	4	302 CM 3 CT
Buffalo & Erie Railway	14	Passenger	Interurban	Motor	Double	One	44— 2	41	18.50	4	
Fonda, Johnstown & Gloversville R.R.	4	Passenger	City	Motor	Single	One	26— 2	31	8.50	2	
Interborough Rapid Transit Co.	1	Passenger	Interurban	Motor	Double	Two	52— 9	57	.....	4	5 CM
	125	Passenger	City	Motor	Double	Train	51— 0½	46	39.50	2	7 CM
Long Island R.R.	25	Passenger	City	Motor	Double	Train	51— 0½	46	37.80	2	3 CT
New York & Queens County Ry.	40	Passenger	Interurban	Motor	Double	Train	63— 4½	78	57.50	2	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 CM
New York State Rys., Rochester	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	
	1	Dump	City	Trailer	Double	.....	40— 6	.....	16.00	.....	
New York, Westchester & Boston Ry.	10	Passenger	Interurban	Motor	Double	Two	72— 0	80	60.00	2	
Olean, Bradford & Salamanca Ry. Co.	4	Passenger	City	Motor	Single	One	29— 1	28	9.76	2	1 IM
Poughkeepsie & Wappingers Falls Ry.	2	Passenger	City	Motor	Single	Both	41—10	44	16.50	4	5 CM
Richmond Light & R.R. Co.	25	Passenger	City	Motor	Double	Both	44— 0	44	16.90	4	
	2	Sweeper	City	Motor	Double	.....	39— 0	.....	27.35	.....	
Schenectady Railway	10	Passenger	City	Motor	Double	One	41— 4½	48	16.00	4	
The Brooklyn City R.R.	335	Passenger	City	Motor	Double	Both	44— 2	50	20.75	4	25 CM Service 69 CM 25 CMS
Third Avenue Railway	49	Passenger	City	Motor	Single	Both	30— 5	36	8.55	2	88 CM
	1	Passenger	City	Motor	Single	Both	35— 3	44	8.55	2	
Pennsylvania											
Bangor & Portland Transit Co.	1	Passenger	Interurban	Motor	Single	One	28— 0½	32	8.60	2	
East Penn. Electric Co.	8	Passenger	Interurban	Motor	Double	Both	43—10	48	17.78	4	
Hershey Transit Co.	8	Passenger	Interurban	Motor	Double	Both	38—11	40	17.11	4	
Johnstown Traction Co.	1	Express	Interurban	Motor	Double	Two	40— 6	.....	30.00	4	
Lackawanna & Wyoming Valley R.R. Co.	3	Passenger	City	Motor	Double	Both	47— 0	50	19.54	4	
Philadelphia & West Chester Traction Co.	4	Passenger	Interurban	Motor	Double	Two	60— 6	72	41.25	2	
Philadelphia & Western Railway Co.	10	Passenger	Interurban	Motor	Double	Two	47—10	64	29.54	4	
Philadelphia Rapid Transit Co.	1	Passenger	Interurban	Motor	Double	Two	50— 6	55	30.24	4	
	100	Passenger	City	Motor	Double	Both	45— 6	53	17.91	2	17 CM 23 CW
Pittsburgh Railways	225	Passenger	City	Motor	Double	Both	45— 0	54	19.00	4	203 CM
Reading Transit & Light Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 CM 2 SM
Shamokin & Mt. Carmel Transit Co.	4	Passenger	Interurban	Motor	Double	Both	45— 0	48	18.00	4	8 IM
	1	Passenger	City	Motor	Single	One	28— 0½	33	8.10	2	
Westchester Street Railway	1	Passenger	City	Motor	Single	One	28— 0½	33	8.33	2	
	6	Passenger	Interurban	Motor	Double	Two	57— 0	70	25.00	4	
West Penn. Rys.	6	Freight	Interurban	Motor	Double	.....	46— 7	.....	22.00	4	
	1	Sweeper	Interurban	Motor	Single	.....	35— 0	.....	.....	2	
York Railways	2	Passenger	City	Motor	Double	Both	42— 0	44	16.50	4	
	3	Passenger	Interurban	Motor	Double	Both	47— 6	52	19.70	4	

*Three-section units.

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Table III—Details of Rolling Stock Ordered During 1924—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
West Virginia											
Monongahela & West Penn Public Service Co.	3	Passenger	City	Motor	Single	One	28— 0½	28	9.00	2	
Princeton Power Co.	4	Passenger	City	Motor	Double	Two	37— 2	40	14	4	
	2	Passenger	Interurban	Motor	Double	Two	37— 2	40	14	4	
Sistersville & New Martinsville Traction Co.	3	Passenger	Interurban	Motor	Double	Both	42— 9	46	15.34	4	
Tygarts Valley Traction Co.	2	Passenger	City	Motor	Single	One	28— 0½	33	8.00	2	2 CT
Wheeling Traction Co.	21	Passenger	City	Motor	Double	One	42— 6	44	10.50	4	8 CM
Total cars Eastern States	1206										
Central States											
Illinois											
Chicago North Shore & Milwaukee R.R.	1	Freight	Interurban	Trailer	Double		40— 6		21.50		2 CM
Chicago Rapid Transit Co.	100	Passenger	City	Motor	Double	Train	48— 0	52	37.50	2	7 CM
Chicago Surface Lines	100	Passenger	City	Motor	Double	Both	48—11	51	20.50	2	
East St. Louis & Suburban Ry.	1	Dump	City	Motor	Double		40— 6		22.50	4	
Illinois Central R.R.	85	Passenger	Interurban	Trailer	Double	Train	72— 7½	84	42.00		
	130	Passenger	Interurban	Motor	Double	Train	72— 7½	84	62.50	4	
Illinois Pwr. & Lt. Corp.	5	Passenger	City	Motor	Single	One	28— 0½	32	8.00	2	
Kankakee & Urbana Traction Co.	1	Passenger	Interurban	Motor	Double	One	42— 0	52	18.00	4	
Indiana											
Gary & Valparaiso Ry.	2	Passenger	Interurban	Motor	Double	Two	44— 8½	44	21.29	4	7 CM
Indiana Service Corp.											1 IM
	1	Passenger	Interurban	Trailer	Double		52— 0	50	27.00		
	2	Parl. Dnr.	Interurban	Motor	Double	Both	62— 0	26	45.50	2	
	3	Sleeping	Interurban	Trailer	Double		62— 0	20	39.40		
Interstate Public Service Co.	2	Express	Interurban	Motor	Double		60— 0		44.35	4	
	3	Express	Interurban	Trailer	Double		52— 0		27.25		
	10	Freight	Interurban	Trailer	Double		42— 0		26.50		
	10	Stock	Interurban	Trailer	Double		39— 7		26.50		
	2	Misc.	Interurban	Trailer	Double		40— 0		28.50		
Terre Haute, Indianapolis & Eastern Tr. Co.	6	Freight	Interurban	Trailer	Double		38— 3		15.50		
	15	Passenger	Interurban	Motor	Double	Two	61— 0	66	45.00	4	
	6	Passenger	City	Motor	Single	One	28— 0	34	9.00	2	
Union Traction Co. of Ind.	5	Express	Interurban	Motor	Double		53— 0		36.00	4	
	15	Freight	Interurban	Trailer	Double		43— 0		18.50		
	5	Stock	Interurban	Trailer	Double		38— 0		16.00		
Winona Service Co.	3	Passenger	Interurban	Motor	Double	Two	49— 9	42	25.00	4	
	4	Passenger	City	Motor	Single	One	27—10	32	8.75	2	
Iowa											
Tri-City Railways	1	Dump	City	Motor	Double		40— 6		22.50	4	
Waterloo, Cedar Falls & Northern Ry.											37 IM
Kentucky											
Kentucky Traction & Terminal Co.	2	Passenger	City	Motor	Single	One	26— 4	24	6.50	2	17 CM
											4 IM
Michigan											
	75	Passenger	City	Motor	Double	Two	48— 5	52	18.50	4	173 CM
City of Detroit—Dept. of St. Rys.	1*	Passenger	City	Motor	Four	Two	122— 8	140	37.50	6	
	2	Dump	City	Motor	Double		40— 6		22.50	4	
	4	Dump	City	Trailer	Double		40— 6		16.00		
	30	Passenger	City	Motor	Double	Both	41—11	52	14.25	4	133 CM
	20	Passenger	City	Motor	Double	Both	42— 6	51	14.25	4	
Detroit United Rys.	10	Passenger	Interurban	Motor	Double	Both	43— 2	46	18.75	4	
	10	Passenger	Interurban	Motor	Double	Two	56— 6	54	33.15	4	
	50	Freight	Interurban	Trailer	Double				20.75		
Grand Rapids Railway	3	Passenger	City	Motor	Double	Both	37— 6	44	12.00	4	
Menominee & Marinette Lt. & Tr. Co.	6	Passenger	City	Motor	Single	One	28— 0½	30	8.25	2	4 CM
Michigan Electric Ry.	15	Freight	Interurban	Trailer	Double		50— 0		19.62		
	2	Freight	Interurban	Motor	Double		50— 0		29.50	4	
Saginaw Transit Co.											6 CM
Minnesota											
Duluth St. Railway	5	Passenger	City	Motor	Double	One	36— 0	43	11.00	4	
Missouri											
United Railways of St. Louis	1	Dump	City	Motor	Double		40— 6		22.50	4	26 CM
	1	Dump	City	Trailer	Double		40— 6		16.50		
Ohio											
Cincinnati, Georgetown & Portsmouth R.R.	2	Passenger	Interurban	Motor	Double	One	40— 0	47	13.00	4	
City of Ashtabula, Div. of Street Rys.	1	Sweeper	City	Motor	Single		30— 0				
	25	Passenger	City	Motor	Double	Two	52— 5½	56	22.10	4	73 CM
	4	Dump	City	Motor	Double		40— 6		22.50	4	
Cleveland Railways	2	Dump	City	Trailer	Double		40— 6		16.00		
	4	Crane	City	Motor	Double		46— 0				
	2	Rail	City	Trailer	Double		60—0				
Columbus, Newark & Zanesville Elec. Ry. Co.	20	Passenger	City	Motor	Single	One	29— 8	28	9.30	2	8 CM
Ohio Public Service Co.	1	Passenger	Interurban	Motor	Double	One	39— 4½	44	15.00	4	
Portsmouth Public Service Co.	3	Passenger	City	Motor	Double	Both	42—11	50	13.00	4	
Stark Electric R.R.	1	Dump	Interurban	Trailer							
The Cincinnati & Dayton Traction Co.	6	Passenger	City	Motor	Single	One	28— 0½	32	8.50	2	
The Cincinnati Traction Co.	1	Dump	City	Motor	Double		40— 6		22.50	4	
The Ohio River Elec. Ry. & Pwr. Co.	7	Passenger	Interurban	Motor	Single	One	29— 0	24	8.50	2	5 IM
The Pennsylvania-Ohio Electric Co.	4	Passenger	Interurban	Motor	Double	One	43—10¼	48	18.50	4	
The Toledo & Indiana R.R.	7	Passenger	Interurban	Motor	Double	One	43— 2	50	15.75	4	
Wisconsin											
The Milwaukee Electric Ry. & Lt. Co.											1 CM
											27 work
Wisconsin Valley Electric Co.	4	Passenger	City	Motor	Double	One	43— 6	52	17.50	4	
Total cars Central States	849										
Southern States											
Alabama											
Birmingham Ry. Lt. & Pwr. Co.	20	Passenger	City	Motor	Double	Two	49— 5	62	17.50	4	
	1	Dump	City	Motor	Double		40— 6		22.50	4	
	2	Dump	City	Trailer	Double		40— 6		16.00		
Arkansas											
Arkansas Central Pwr. Co.	8	Passenger	City	Motor	Double	Both	42— 5½	44	17.50	4	

*Three-section units

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Table III—Details of Rolling Stock Ordered During 1924—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
Florida											
Coral Gables Construction Company	5	Passenger	City	Motor	Single	One	28— 0½	33	8.14	2	
Miami Beach Electric Co.	6	Passenger	City	Motor	Single	One	28— 0½	33	8.16	2	
Munic. Ry. of St. Petersburg	7	Passenger	City	Motor	Double	One	40— 1	48	14.70	4	1 CM
	8	Passenger	City	Motor	Single	One	28— 0½	32	8.20	2	
Tampa Electric Co.	7	Passenger	City	Motor	Double	One	45— 7	52	16.00		
Georgia											
Columbus Transportation Co.											6 CM
Louisiana											
Baton Rouge Electric Co.	5	Passenger	City	Motor	Single	One	28— 0	32	7.00	2	
New Orleans Public Service, Inc.	55	Passenger	City	Motor	Double	Both	47— 8	52	20.75	2	
	2	Dump	City	Motor	Double		40— 6		22.50	4	
	2	Dump	City	Trailer	Double		40— 6		16.00		
Shreveport Railways	3	Passenger	City	Motor	Double	Both	40— 9	53	15.00	4	
North Carolina											
Asheville Power & Light Co.	6	Passenger	City	Motor	Single	One	28— 0½	33	8.17	2	
Durham Public Service Co.	4	Passenger	City	Motor	Double	One	39— 1½	48	14.00	4	4 CM
South Carolina											
North Anderson St. Ry.	1	Passenger	City	Motor	Single	One	28— 0½	33	8.10	2	
Tennessee											
Knoxville Power & Light Co.	7	Passenger	City	Motor	Double	One		51	13.80	4	10 CM
	7	Passenger	City	Motor	Single	One		29	8.50	2	
Memphis St. Railway	1	Dump	City	Motor	Double		40— 6		22.50	4	
	1	Dump	City	Trailer	Double		40— 6		16.00		
Total cars Southern States	158										
Western States											
California											
Fresno Traction Co.	12	Passenger	City	Motor	Double	Both	42— 5	44	15.50		
Key System Transit Co.	12	Passenger	Interurban	Motor	Double	Two	57— 7	68	30.00	2	
	4	Dump	Interurban	Motor	Double		40— 0		22.50	4	
	2	Dump	Interurban	Trailer	Double		40— 0		16.00		
Los Angeles Ry.	121	Passenger	City	Motor	Double	Both	48— 3	52	21.50	4	
Market Street Ry.	20	Passenger	City	Motor	Double	Two	47— 0	50	18.80	4	9 CM
	2	Dump	City	Motor	Double		40— 6		22.50	4	
Pacific Electric Ry.	50	Passenger	City	Motor	Double	Two	52— 2	65	28.90	4	3 CM
	600	Freight	Interurban	Trailer	Double		40— 8½		21.40		8 CS
	600	Freight	Interurban	Trailer	Double		43— 0½		23.85		36 IF
	150	Freight	Interurban	Trailer	Double		40—10		16.70		
Pacific Gas & Electric Co.	5	Passenger	City	Motor	Double	Both	40— 0	42	14.50	2	
Colorado											
Southern Colorado Power Co.	1	Passenger	City	Motor	Single	One	28— 0½	32	8.60	2	
Kansas											
Union Traction Co.	6	Passenger	Interurban	Motor	Double	Two	45— 0	45		4	
Montana											
Helena Light & Railroad Co.	3	Passenger	Interurban	Motor	Double	One	38— 9	48	16.00	4	
Nebraska											
Omaha & Council Bluffs Street Ry.	1	Dump	City	Motor	Double		40— 6		22.50	4	
North Dakota											
Northern States Power Co.											4 CM
Oklahoma											
Muskogee Electric Tr. Co.	6	Passenger	City	Motor	Single	One	28— 0½	34	8.00	2	
Texas											
Eastern Texas Electric Co.	8	Passenger	City	Motor	Double	Two	40— 1	4		4	
El Paso Electric Ry Co.											
Galveston Electric Co.											5 CM
Houston Electric Co.	10	Passenger	City	Motor	Single	One	28— 0½	32	7.50	2	
San Antonio Public Service Co.	15	Passenger	City	Motor	Double	Two	40— 1	44		4	
											15 CT
											17 CM
Texas Interurban Ry.	6	Passenger	Interurban	Motor	Double	One	48— 5	56	17.00	4	
	1	Express	Interurban	Motor	Double		45— 8		17.00		
The Abelene Traction Co.	1	Passenger	City	Motor	Single	One	32— 0	32	6.00	2	
Washington											
Grays Harbor Ry. & Lt. Co.	2	Passenger	City	Motor	Double	One	43— 3	52	16.00	4	
Total cars Western States	1638										
Philippine Islands											
Manila Electric Co.	20	Passenger	City	Motor	Double	Two	41— 5	60	14	[2	
Total cars Philippine Islands	20										
Dominon of Canada											
Nova Scotia											
Cape Breton Electric Co.											2 CM
Ontario											
Ft. William Electric Railway	1	Passenger	City	Motor	Double	One	48— 0	60		4	
Hydro Electric Power Commission	4	Passenger	City	Motor	Double	Both	45— 3	44	20.75	4	
	2	Passenger	Interurban	Motor	Double	Two	50— 0	60	24.90	4	
Ottawa Electric Railway	30	Passenger	City	Motor	Double	Both	45— 3	54	19.25	4	
Toronto Suburban Ry.	1	Passenger	Interurban	Motor	Double	Two	61— 9	66	39.90	4	1 IM
Toronto Transportation Commission	1	Line	Interurban	Motor	Double						
	3	Sweepers	City	Motor	Single						7 M
Quebec											
Montreal Tramways	25	Passenger	City	Motor	Double	Two	45— 3	42	22.00	4	64 CM
	25	Passenger	City	Trailer	Double		44— 3	45	19.00		
	2	Obs'rv't'n	City	Motor	Double	Two	47— 7	50	22.32	4	
Sherbrooke Ry. & Pwr. Co.	1	Crane	City	Motor	Double		42— 0		38.80	4	
	3	Passenger	City	Motor	Single	One	32— 0	32	8.00	2	
Total cars Canada	98										

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the Department of Street Railways for the city of Detroit 75 two-man cars, one articulated unit and six dump cars, the Detroit United Railway 20 cars for interurban service, 50 one-man, two-man cars for city service and 50 freight interurban trail cars, the Boston Elevated Railway ordered 56 one-man, two-man cars and eight additional cars for train operation, New Orleans Public Service, Inc., 55 one-man, two-man cars and 4 dump cars, the Montreal Tramways 25 two-man cars, 25 trailers, two observation cars and one crane car, the Third Avenue Railway, New York, 50 one-man, two-man cars, and the Pacific Electric Railway 50 two-man cars and 1,350 freight cars. Of the above orders, those placed by the Boston Elevated Railway, the Baltimore & Ohio Railroad, the Interborough Rapid Transit Company, the Chicago Rapid Transit Company and the Illinois Central Railroad were for cars for train operation. Adding the cars ordered by the Long Island Railroad, the New York, New Haven & Hartford Railroad, and the Brooklyn-Manhattan Transit Corporation gives a total of 610 cars for train operation.

The numbers of cars junked during 1924, which was 1,853, exceeds that for any other year of which this paper has a record. It compares with 1,689 junked during 1923. It is thus evident that much obsolete rolling stock is being retired to give space for more modern equipment.

According to the replies received the number of companies ordering new rolling stock during 1924 was 119, as compared with 167 for 1923, 145 for 1922 and 94 for 1921. There were thus fewer companies ordering cars, but the average ordered by each company was greater.

In order to show at a glance the relative amount of rolling stock purchased by the various railways year by year, Table I has been prepared. This gives the total number of cars ordered each year since 1907. This divides the cars into four classes: Passenger cars, both city or interurban; freight, express and miscellaneous cars, and electric locomotives. The miscellaneous cars include service cars, snowplows, sweepers, work cars, etc. The chart shows graphically the number of cars ordered each year since 1916. In this chart the cars purchased are divided into two groups, interurban and city service. This division, which has been made in annual surveys of this paper since 1916, was made for passenger cars only prior to that year. It is evident that the number of cars purchased for interurban service this year is the greatest of any recorded, while the number of cars purchased for city service is about the same as for the years 1917, 1918 and 1919.

TABLE IV—ELECTRIC LOCOMOTIVES ORDERED DURING 1924

Name of Railway	Number	Weight, Tons	Length Over All, Ft. In.
New England States			
Aroostook Valley R.R.	1	60	35—9
New York, New Haven & Hartford R.R.	5	127	52—8
	2	87	39—0
	2	60	38—3
Springfield Terminal Ry.	1	50	35—9
Eastern States			
New York Central R.R.	7	100	37—0
	2	170	67—4
Pennsylvania R.R.	1	120	——
Central States			
Ohio Public Service Co.	1	45	40—0
	1	65	45—0
South West Missouri R.R.	1	50	37—4
Western States			
Pacific Electric Ry.	5	63	32—0
Canada			
Niagara, St. Catherines & Toronto Ry.	2	55	35—4
Total	31		

TABLE V—RECAPITULATION BY DISTRICTS OF CARS ORDERED DURING 1924

	New England States	Eastern States	Central States	Southern States	Western States and Philippines	Total for United States	Total for Canada	Grand Total
Number of companies reporting new cars	8	36	36	14	18	112	7	119
City Service								
One-man cars, 28-ft. body	2	17	29	38	17	103	....	103
One-man cars other than 28 ft.								
Single truck	....	4	20	....	1	25	3	28
Double truck	....	31	9	25	2	67	1	68
One-man two-man cars	61	769	156	66	138	1,190	34	1,224
Two-man cars (surface)	....	18	101	20	113	252	27	279
Motor cars for rapid transit lines	8	150	100	....	....	258	....	258
Trailers	....	....	....	....	....	....	25	25
Service and miscellaneous cars	....	4	24	9	3	40	4	44
Total cars city service	71	993	439	158	274	1,935	94	2,029
Interurban Service								
One man cars, double truck	4	24	15	....	9	52	....	52
Single truck	1	1	7	....	....	9	....	9
One-man, two-man cars	....	26	12	....	....	38	....	38
Two-man cars	15	34	30	....	18	97	3	100
Trailers	....	....	4	....	....	4	....	4
Motor cars for train service	....	120	215	....	....	335	....	335
Express and freight cars	....	7	124	....	1,351	1,482	....	1,482
Miscellaneous cars	1	1	3	....	6	11	1	12
Total cars interurban service	21	213	410	....	1,384	2,028	4	2,032
Electric locomotives	11	10	3	....	5	29	2	31
Total cars and electric locomotives	103	1,216	852	158	1,663	3,992	100	4,092

The special comparison of cars ordered during the past 9 years, given in Table II, tabulates separately the cars for city service and those for interurban service. Referring to this table, it is interesting to note how the number of 28-ft. safety cars purchased increases each year from 1916 up to and including 1920, and during the same period how the number of large two-man cars shows a gradual decrease. Since that time the number of small safety cars purchased has decreased and the number of larger cars has increased considerably. The highest proportion for the small safety cars was reached in 1919, and since that time there has been a gradual return to the use of larger cars.

Details of rolling stock ordered by individual companies are given in Table III. The arrangement of this table this year is different from that used in preceding years in that in general the arrangement into groups follows one of the plans of grouping the states used by the United States Census Bureau. The railways in each state are arranged in a manner similar to that followed in previous years. Canadian companies are listed separately. In addition to listing the number of cars ordered by the various companies, this table shows the class of car and type of service and also gives length, seating capacity, weight and number of motors. The largest number of cars purchased by railways in any particular state was in New York, which includes 584 passenger cars for city service and 65 passenger cars for interurban service. Pennsylvania comes next with 332 passenger cars for city service and 45 cars for interurban operation.

The articulated type of car makes its first appearance in the list of cars ordered during 1924. The city of Detroit ordered one unit for surface operation and the Brooklyn-Manhattan Transit Corporation four units for rapid transit service. In addition to these, Brooklyn and Baltimore reconstructed cars to form articulated units.

Purchases of electric locomotives during 1924 are listed in Table IV. The total number of new electric locomotives is 31. The New York, New Haven & Hart-

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ford and the New York Central were the largest purchasers, each having ordered nine.

The information which has been assembled and given in the accompanying tables of rolling stock was obtained from replies received to questionnaires sent to all electric railways in the United States and Canada. Replies were received from approximately 800 railways this year. With a fixed publication date it is quite impossible to receive the replies from all railways, but this year the answers have been particularly comprehensive and the information thus obtained has also been supplemented by items previously published in the ELECTRIC RAILWAY JOURNAL and also by very complete lists of car orders furnished by the principal car builders. Through the courtesy and co-operation of the various manufacturers, we have been able to check the figures obtained from the various railways very carefully, and in some cases where replies were not received from the railways themselves, the information furnished by the car manufacturers has been used.

More Financing on Better Terms

Many New Issues Placed With Investing Public Last Year—Sales Not Difficult to Make—Equipment Trusts on Increase—Buses Included Under Equipment Indentures—Issues Show Year's Accomplishments

PREDICTIONS made a year ago by bankers with respect to the prospects ahead for the satisfactory sale of securities by the electric railways during 1924 have been borne out by the developments of the year. Whereas for 1923 the total of new bond and note financing in amounts of $500,000 or more was only $20,867,000, the total this year is more than $85,000,000. In the same period of time 10 electric railways sold direct to the riding public more than $9,750,000 of securities. Of this amount $7,000,000 were for increases to capital investment to be used for additions, extensions and improvements. The remainder, amounting to $2,750,000, represents stock purchased in the open market by the electric railways and resold to employees and customers. With possibly a single exception, this past year is the first time that an attempt has been made to sell securities of the electric railways direct to the public. All these are securities of companies that do solely an electric railway business.

FINANCING DONE ON BETTER TERMS

Not only is the amount of bonds sold greater than last year, as has just been pointed out, but it has been possible for the electric railways to do their financing on much better terms. Money has been cheaper, but the entire answer is not to be found there. Rather is it to be found in the growing realization of the essentiality of the industry and its right generally to a living wage.

The biggest piece of electric railway financing in 1924 was that of the Market Street Railway, San Francisco. This was a refunding operation, carried out in January, 1924, to the amount of $13,000,000. The return of 7 per cent on this issue was the highest with possibly one exception of all the electric railway offerings of the year. From this liberal yield, the income to the investor tapered down to a return of 5.35 per cent on the 10-year Boston Elevated Railway 5½ per cent issue of $1,581,000 placed at 101.25 and interest. These yields, of course, apply in the case of the general financing and not to the financing covered by equipment trust obligations.

Best of all, the electric railway issues placed in 1924 found a ready market and many of them were snapped up by discriminating investors. One of the companies that participated in the large loans of the Market Street Railway said frankly in a discussion of traction securities intended to reach investors:

"We are taking advantage of the present unfriendliness of the market for street railway securities to obtain for our customers a bond which we are willing to recommend with absolutely no reservations as a conservative investment, giving a return from one-half to one full per cent above what can be obtained on securities of similar values. We do not deny that street railway bonds are still in disfavor; in fact, we would rather stress this disfavor than otherwise, because it is that very condition which enables us to do pioneering work in a neglected field and to obtain an attractive rate for our clients."

SIX-YEAR RECORD OF NEW ELECTRIC RAILWAY FINANCING INVOLVING BOND OR NOTE ISSUES OF MORE THAN $500,000

	City Railway	Interurban	City and Suburban
1919	$22,800,000	$6,050,000	$7,550,000
1920	2,250,000	2,340,000	4,200,000
1921	11,740,000	1,900,000	7,250,000
1922	865,000	750,000	27,138,000
1923	14,562,000	.....	6,305,000
1924	50,797,000	21,731,600	11,414,000

This is a very frank statement. It is very much to the point. As a matter of fact, the Market Street Railway offering was by far the largest of its kind made for a long time. There was a certain amount of sales resistance to be overcome in placing the issue. It was overcome and overcome most successfully. Within a comparatively short time the issue had all been placed.

GENERAL OUTLOOK GOOD

On one thing the bankers are agreed. This is that the adverse conditions of the railways in New York City do not weigh with them so much now as they did formerly. They are less prone to measure tractions elsewhere by the New York yardstick. It was generally agreed that the good public relations work has helped materially in strengthening the faith of the bankers in the electric railway situation. The occurrences of suspension of service by railways, notably the withdrawal of service in Akron and the subsequent passing of the new franchise grant there, have gone a long way to prove the essentiality of electric railway service. In this connection, it is interesting to note that the size of the property which seeks to place a security does not weigh heavily with the bankers. They look at situations individually and consider each case on its merits. Thus, at this time, one of the very largest houses has in prospect some electric railway financing to the amount of

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only $700,000. The bankers took this issue because the railway has made a notable record in the past, and the issuing house feels confident that this property, interurban in character, can make as good a record of earnings in the future as it has in the past.

In this connection, one banker said that there has been much talk of the inroads of private automobiles on the suburban and interurban railways, but that while the effect of the increasing use of the private auto had undoubtedly been felt, still people pushing out into the country to live were certain to locate along the line of the railway and that not all of the members could use the automobile at the same time, except, perhaps, for certain pleasure riding. In other words, from an average family of five or six, the interurban railway will be sure to derive a large amount of riding during any given year.

Banker's Predictions Come True

But this is intended to be a record of the financing of the year. Not that the views of the bankers about the situation are not of great interest. They are. During the year, however, there was a series of notable papers on the economic outlook for electric railways and the prospects for financing. At the October convention T. N. Carver, C. W. Kellogg, Allen G. Hoyt, Fred Scheel and J. P. Harris all spoke about the outlook for the railways. Moreover, the financial condition of the industry was the topic at the afternoon session of the Midyear Meeting of the American Electric Railway Association at St. Louis on March 4. For the most part, these papers were economic in their treatment, but B. C. Cobb of Hodenpyl, Hardy & Company, did discuss the outlook for the future and referred to specific issues.

He said in conclusion that what he wanted to get into the minds of his hearers was that electric railway securities are now beginning to attract attention and many buyers heretofore not receptive are looking them up. He said that during the year up to the time he spoke the electric railways had all been successful in selling their bonds and short-term notes on a basis of from 6.25 per cent to 7 per cent in a highly competitive market. As he saw it the success of these companies undoubtedly would encourage others to enter the market, and as the public became acquainted with the improved financial condition of the electric railways the demand for their securities would increase. Is it logical, said he, that a railway bond issued by a road that is in a growing and prosperous community, one that earns more than two and one-half times its interest charges, should go begging? He said no; and when the investing public gets over its scare, it will not. The events of the year have proved Mr. Cobb to be correct. In fact, in the light of the events that have come to pass his words of last March were prophetic.

Big Increase in Equipment Trust Financing

A very interesting development of the year was the increasing extent to which resort was made to the use of equipment trust obligations in connection with the purchase of new equipment. The amount of these security offerings and other financial matters connected with them are shown in an accompanying table. Notable among such issues were those secured and made by the Pacific Electric Railway, Los Angeles; the Detroit United Railway, the Memphis Street Railway, the Louisville Railway, the Connecticut Company, the Pittsburgh Railways, the Philadelphia Rapid Transit Company and the Buffalo & Erie Railway.

PRINCIPAL ELECTRIC RAILWAY MATURITIES IN 1925
BASED ON DOW, JONES & COMPANY'S COMPILATION

Due		Corporation:	Rate	Amount
Jan.	1	Toledo, Fremont & Norwalk R.R. 1st	6½	$1,115,000
Jan.	1	Nashville Street Ry. 1st	5	907,000
Jan.	1	Int. Rapid Trans. eq. tr. B	6½	450,000
Jan.	1	Reading & Womelsdorf E. Ry. 1st	5	400,000
Jan.	1	Eastern Mass. St. Ry. serial	6	300,000
Jan.	1	Wilkes-Barre & Wyom. Val. T. clt	5	245,000
Jan.	2	Jefferson Traction 1st	6	441,000
Jan.	15	Minn., Lyndale & Minnetonk Ry.	7	5,000,000
		January total		$8,858,000
Feb.	1	Metropolitan Railroad 1st	5	$1,809,000
Feb.	1	Schuylkill Electric Ry. 1st	6	293,000
Feb.	1	Phila. Rap. Transit eq. tr. G	5½	237,500
Feb.	1	Pittsburgh Rys. car tr	6	200,000
		February total		$2,539,500
Mch.	1	Butte Electric Ry. 1st	5	$700,000
Mch.	1	Worcester Cons. St. Ry. ext	7	700,000
Mch.	1	Berkshire Street Ry. deb	5	200,000
Mch.	15	Inter. Rapid Transit eq. tr. A	6	280,000
		March total		$1,880,000
May	15	London (Ont.) Street Ry. deb	5	$475,000
		May total		$475,000
June	1	Worcester & So'bridge St. Ry. 1st	4½	$200,000
June	15	Chi., Nor. Shore & Milw. 1-yr	6	3,500,000
		June total		$3,700,000
July	1	Winnipeg, Selk & L. Winn Ry. ref	5	$1,000,000
July	1	Winona Interurban Ry. 1st	5	750,000
July	1	Chatham, Wall & L. Erie Ry. 1st	5	694,500
July	1	Lima, Find & Toledo Ry. 1st	5	324,000
July	1	International Railway clt	7	226,000
		July total		$2,994,500
Aug.	1	Galveston-Houston Elec. nts. A	7	$1,700,000
Aug.	1	Galveston-Houston nts. B	7	500,000
Aug.	1	Phila. Rapid Transit eq. tr. G	5½	237,500
		August total		$2,437,000
Nov.	1	Scranton Railway gen. ext	7	$1,000,000
Nov.	1	Inter. Rapid Transit eq. tr. C	6	570,000
		November total		$1,570,000
Dec.	1	Phila. Rapid Transit 2-yr	6	$3,500,000
Dec.	15	Phila. Rap. Transit eq. tr. H		270,000
		December total		$3,770,000
		Grand total		$28,224,000

The Louisville issue was placed with the public on a 6 per cent basis, the Memphis issue on a 6.25 per cent basis, the Pittsburgh issue on a 5.22 to 6 per cent basis, the Pacific Electric Railway issue on a 5.08 average yield, the Connecticut Company issue on a 6 per cent basis, the Detroit United issue on a 5 to 6 per cent basis, the Philadelphia Rapid Transit issue on a 4.74 per cent to 5.50 per cent basis and the Buffalo & Erie Railway issue on a 4¾ to 6 per cent basis. Incidentally, the placing of these issues shows the growing tendency of the electric railways to modernize and merchandise. The saving in operating expenses through the use of thoroughly modern equipment is an important factor that often makes it possible for companies to amortize the purchase price of new equipment in a period of a comparatively few years.

A recapitulation of the equipment trust offerings shows that in the last year 617 cars have been bought and secured under this plan and a total of 272 motor buses have been similarly financed. Moreover, information obtained about the details of these offerings shows that the practice has been to pay not less than 25 per cent of the estimated cost of the equipment in cash, while in the Louisville case, the proportion in cash was about 40 per cent. The number of cars purchased by the Louisville Railway was not specified. The net cost of the equipment was $375,000, of which the Louisville Railway made a cash initial payment of $150,000. In

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the case of the Memphis Street Railway the cost of equipment was $459,000, of which 25 per cent was paid in cash. This equipment consisted of 40 cars of the 55-passenger double-truck type. The cost of the equipment for the Pittsburgh Railways was more than $3,600,000. The company paid approximately $600,000, or 16 per cent in cash. This equipment consisted of 60 single-end, center-entrance, semi-convertible, double-truck, semi-steel cars, 16 semi-steel passenger cars, and 65 semi-steel cars of the one-man, two-man types.

The equipment for the Southern Pacific Company, according to estimates of the Railroad Commission of California, cost $1,632,039. Of this sum about $327,408, or 20 per cent, was paid in cash. The equipment here secured included five electric locomotives, 50 center-entrance steel cars, 12 one-man, two-man cars, and six electric motor coaches for interurban service.

In the case of the Connecticut Company the total cost of the equipment originally was $906,968. The equipment was bought in 1918 for the Connecticut Company with funds furnished by the United States Housing Corporation. Engineers reported the value of the cars at the time of the offering by the bankers in July was $770,000. The amount of the equipment trust issue in this case was $450,000, or approximately 60 per cent, showing that approximately 40 per cent had been paid in cash. Since 1915 the company has issued a total of $1,797,500 of equipment trust notes, on which $1,170,000 has been paid in July, 1924, leaving $627,500 outstanding at that time. The equipment secured by this issue was 50 convertible steel passenger cars, with a capacity of 56 passengers each, and 20 convertible steel passenger cars with a capacity of 32 passengers each.

The Detroit United equipment cost $1,630,000, of which $330,000 was paid in cash. In offering this issue for public subscription the bankers emphasized the fact that 52 per cent of the certificates matured during the first 3½ years. The equipment secured by the deed of trust in this case consists of eight heavy interurban cars, six interurban passenger chair cars, 15 double-truck, 52-passenger one-man cars, 50 trail box cars, 25 single-deck, 29-passenger buses, 10 double-deck buses and 40 29-passenger single-deck, four-cylinder coaches.

The Philadelphia Rapid Transit Company equipment cost $3,772,000. The par value of the certificates represents approximately 75 per cent of the entire cost of the railway cars, but less than 70 per cent of the cash cost of motor vehicle equipment. This equipment consists of 100 standard double-truck cars, 125 double-deck motor coaches, 77 single-deck motor coaches, and 11 service trucks.

The Buffalo & Erie Railway equipment will cost not less than $285,000, which is more than 142 per cent of the face value of the certificates. The issue will be secured by deposit with the trustee of 14 double-truck passenger cars, four single-truck passenger cars and two snowplows. The 18-passenger cars are to be of the "Lexington" type designed for high-speed service.

NOT ALL EQUIPMENT TRUSTS WERE PLACED DIRECT WITH PUBLIC

By no means do the figures for equipment trusts issued to the public cover the total of financing of this kind. There is every reason to believe that there was a fairly larger volume of purchases financed by means of similar obligations placed direct with the car build-

DETAILS OF NEW BOND AND NOTE FINANCING IN AMOUNTS OF MORE THAN $200,000 OFFERED PUBLICLY DURING 1924

Issue	Sale Price	Maturity	Yield	Amount
JANUARY				
Louisville Railway car trust 6 per cent gold certificates	100 and interest	Serially 1924–1934	6	$230,000
Market Street Railway first mortgage 7 per cent sinking fund bonds	100 and interest	1940	7	13,000,000
Philadelphia Rapid Transit Company real estate first mortgage 6 per cent	100 and interest	1944	6	2,500,000
Memphis Street Railway equipment trust 6 per cent certificates	100 to 98.16 and interest	Serially 1924–1933	6 to 6.25	344,000
Maryland Electric Railways 6½ per cent first and refunding mortgage gold bonds	100 and interest	1957	6½	4,000,000
MARCH				
Boston Elevated Railway 6 per cent gold bonds	103 and interest	1933	....	3,000,000
Key System Transit Company first mortgage 6 per cent bonds	99½ and interest	1938	6.05	2,500,000
APRIL				
Key System Transit Company general and refunding mortgage 5 per cent	78 and interest	1938	7.75	1,118,000
Holyoke Street Railway first mortgage 6 per cent bonds	102 and interest	1938	5.75	550,000
West Penn Railways 6½ per cent gold debentures	99 and interest	1927	6.87½	3,500,000
Grand Rapids Railway 7 per cent sinking fund gold bonds	99½ and interest	1939	7+	3,2 0,000
North Hudson County Railway improvement mortgage 5 per cent bonds (Public Service Ry.)	See note (*a*)	(*b*) 1926	6	1,291,000
Pittsburgh Railways 6 per cent car trust bonds	100.50 to 100 and interest	1925–1939	5.22 to 6	3,000,000
(*a*) Pacific Electric Railway 5 per cent equipment trust certificates	99½ and interest	1925–1939	5.08 av. yield	1,305,600
JUNE				
Chicago Rapid Transit Company first and refunding mortgage, 6½ per cent gold bonds	94½ and interest	1944	7+	6,500,000
Hestonville, Mantua & Fairmount Passenger Railroad 5½ per cent gold bonds	100 and interest	(*c*) 1934	5½	1,250,000
Detroit United Railway first mortgage and collateral trust bonds	99 and interest	1929	6.20	9,000,000
Chicago, North Shore & Milwaukee Railroad 6 per cent gold notes	.....	1924	....	3,500,000
JULY				
Boston Elevated Railway ten-year 5½ per cent gold bonds	101.25 and interest	1934	5.35	1,581,000
Connecticut Company 6 per cent equipment trust 6 per cent gold notes	100 and interest	Serially 1924–1934	6	450,000
Winona Service Company (Winona Interurban Railway)	.....	.....	.....	600,000
OCTOBER				
Chicago Rapid Transit Company first and refunding mortgage 6½ per cent bonds	94½ and interest	1944	7 (*d*)	2,500,000
Minneapolis Street Railway 5½ per cent gold notes	100 and interest	1928	5½	5,000,000
NOVEMBER				
Erie Railways 6 per cent gold bonds	95 and interest	1954	6½	1,000,000
Detroit United Railways equipment trust 6 per cent certificates	100.40 to 100	1925 to 1934	5 to 6	1,000,000
DECEMBER				
Montreal Tramways first and refunding mortgage 5 per cent bonds	95 and interest	1941	5.45	3,266,000
Philadelphia Rapid Transit Company 5½ per cent equipment trust certificates	100.75 to 100	Serially 1925–1934	4.75 to 5.50	2,700,000
Chicago, North Shore & Milwaukee Railroad first and refunding mortgage 6 per cent (series A)	98 and interest	1955	6.15	7,000,000
Buffalo & Erie Railway equipment trust gold certificates	100 to 100¾	1925–34	4¾ to 6	200,000
Total	.....	.....	.....	$84,884,600

(*a*) Extended at 101 per cent with option to holder to redeem at par.
(*b*) Extended from 1924.
(*c*) Extended issue.
(*d*) Total issue $17,640,000 and included five electric locomotives, 50 center-entrance steel street cars, 12 one-man steel street cars and six electric motor coaches, estimated by State Railroad Commission to cost $1,632,039, but mortgaged for 80 per cent of purchase price.

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ers. For instance, the Richmond Light & Railroad Company, Staten Island, is known to have executed car trust certificates to the amount of $250,000 direct to the car builders in part payment for new rolling stock. In this case twenty double-truck cars found to be unsuitable for meeting present conditions were replaced with 25 one-man, two-man cars. The cost of this equipment was $334,375. These certificates bear interest at the rate of 6½ per cent and the company agreed to redeem them at the rate of $25,000 a year. In this case a financial expert retained by the company reported that in view of the relatively small number of the equipment units upon which the proposed issue of the certificates would be placed, and considering the not so well standardized and stabilized type of equipment in the electric street railways, as evidenced by this present specific instance of the proposed retirement of cars which are by no means old or worn out, an interest rate as low as upon trunk-line railroad equipment could not reasonably be expected. It is reasonable to assume, said this authority, that the management of this company has obtained the lowest rate which in the exercise of business judgment it has been able to negotiate.

A somewhat similar case was presented in Trenton. There approval was granted in August by the Board of Public Utility Commissioners to the car trust agreement entered into on July 8 by the Trenton & Mercer County Traction Corporation, Trenton, N. J., with the J. G. Brill Company. In the same action the board authorized the railway to issue 10 serial notes aggregating $409,943. Of this amount $242,122 is listed as the principal and $70,821 as the interest thereon. The application of the railway to the commission was the outgrowth of the corporation's plan to add 20 new cars to the service—an improvement already approved by the commissioners.

Tendency to Strengthen Sinking Fund Requirements

Another change noted during the year was the tendency to increase the sinking fund provisions. Both the San Francisco refunding issue and the Detroit equipment issues illustrate this. These are all matters of public record. In the San Francisco case the company has covenanted to provide a sinking fund of $500,000 a year from Jan. 1, 1925, through 1932. Bonds are to be purchased in the open market at not to exceed their redemption prices, or if not so obtainable to be recalled and kept alive until Jan. 1, 1933, and their interest used to acquire additional bonds. The bonds then held in the sinking fund will be canceled and thereafter the company will provide a quarterly sinking fund of $300,000 a year until maturity for like purchase or redemption. The bonds acquired will be kept alive and the interest thereon will be added to the sinking fund. The operation of the sinking funds, assuming bonds retired at call price, will reduce this issue to $8,075,000 on Jan. 1, 1933, and to $5,460,000 on Jan. 1, 1940. Proceeds from the sale of any mortgage property are to be added to the fixed sinking payments.

On the other hand, the Maryland Electric Railway issue calls for a sinking fund of 1 per cent of all the first and refunding mortgage bonds, series A, from time to time outstanding. The first payment is to be made on Jan. 1, 1925. This is in addition to a fund of not less than 1 per cent per annum for improvements, depreciation and obsolescence. In the $6,500,000 Chicago Rapid Transit issue, the sinking fund does not begin to operate until Jan. 1, 1929, but on the first days of January and July of that year and on the similar days each year thereafter an amount equal to one-half of 1 per cent of the total amount of the bonds must be provided for the sinking fund. In the case of the Boston issue of $1,581,000 emphasis was laid on the fact that the company is charging 24 per cent of the total railway revenue to maintenance and depreciation. The mortgage by which the $7,000,000 of the Chicago, North Shore & Milwaukee Railroad first and refunding bonds are secured provides for a sinking fund beginning Dec. 1, 1925, with semi-annual payments equal to one-half of 1 per cent of the principal amount of the bonds then outstanding under the mortgage and underlying bonds at such times in the hands of the public.

Financing of Special Improvements Arranged

It will be recalled that in the review of the financial situation in the ELECTRIC RAILWAY JOURNAL for Jan. 5, 1924, reference was made to the possibility of the railways making loans on a particular improvement, especially when such improvement involved the development of real estate. It was explained at that time that the carhouse, shop or terminal might be financed by a distinct loan where the buildings were located where there was a real chance of appreciation in land value. In this connection, it is interesting to note that loans along these lines were brought out during the year by both the Indianapolis & Cincinnati Traction Company and the Philadelphia Rapid Transit Company.

The Indianapolis & Cincinnati Traction Company was anxious to rehabilitate the entire line, but the matter of finances presented an obstacle which was considered insurmountable by many who analyzed the situation. A plan, however, was finally devised by President Charles L. Henry for extending the principles of the equipment trust method commonly used for financing the purchase of rolling stock to include substation equipment and feeder lines as well. J. F. Wild & Company, a local investment banking firm, agreed to finance the project on the basis of such an equipment trust through the sale of securities to the amount of 80 per cent of the total required, provided that the remaining 20 per cent could be raised in such a way that these securities became a first lien on the total amount of the trust equipment. The necessary additional 20 per cent was advanced by a small group of bondholders of the road who had faith in the ultimate result of the improvement and agreed to accept a second lien as security, in order to make the improvement possible. Preferred stock paying 6 per cent was issued by an intermediate company through which the details of the matter were arranged. The stock comprises two series, covering the 80 per cent first lien and the 20 per cent second lien, respectively. As explained in the elaborate series of articles the first of which was published in the ELECTRIC RAILWAY JOURNAL for July 26, page 113, these securities were all handled on a 10 per cent brokerage basis, and the total funds required were banked before any orders were placed with the manufacturers.

Extension of the equipment trust method of financing to the purchase of substation and feeder equipment made it important to avoid any questions or complications as to title to substation buildings or equipment. This was done by purchasing land sites adjacent to the railway right-of-way for the erection of the substation buildings. Although each of the new stations adjoins an old transformer station which was suitable physi-

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cally for conversion into a rotary converter substation, the question of complication in title made it desirable to adopt the plan of purchasing sites off existing railway property and erecting new buildings. However, by making the new structures as simple as possible, consistent with security and fireproof construction, the total cost of land and buildings was held to within $20,000 of the estimated cost of making changes in existing transformer station buildings.

All feeder cable strung along the right-of-way on the railway's poles, as well as other property purchased with equipment trust funds, was plainly tagged at frequent intervals for identification. Annual rental and installment payments by the railway are to be made at a rate which will wipe out the total cost of the new equipment at the end of ten years.

The Philadelphia Rapid Transit Company loan was strictly a real estate first mortgage in which an issue of 6 per cent bonds was secured by a first mortgage on three modern car terminals of brick and concrete construction advantageously located in the northern, central and southern sections of the city of Philadelphia. It was explained that the terminal properties on which these bonds were secured by a first mortgage had a value of $4,083,040, and that the real estate itself had a value of $1,720,000, making a total real estate value for all of the property of more than $5,800,000.

Reference has been made to the fact that the $2,098,000 of the Boston Elevated Railway 6 per cent 10-year bonds was sold at 103 and interest to yield about 5.60 per cent. The Boston Elevated Railway is under public management and operation, pursuant to an act of the Legislature of Massachusetts. This is regarded as having a favorable effect on the prices at which the company is able to do its financing. Aside from this, however, early in the present year, the road's bonds for the first time in 5 years had the advantage of a savings bank market. In other words, the bonds were returned to the so-called legal list. In 1905 the company was able to dispose of an issue of $7,500,000 bearing 4 per cent interest at 103.692.

In 1923 the largest maturity was $13,115,000 of secured notes of the New England Investment & Security Company. This issue came due last April. The total originally was $16,250,000 issued to the New York, New Haven & Hartford in 1909 in settlement for repairs and other work. Since then $3,135,000 has been received and canceled. This is largely an intercompany matter and it is understood that the refunding or extension of these notes will soon be ready for consideration. The Market Street Railway refunding issue has been referred to before. The $1,500,000 of bonds of the Boston Elevated Railway which became due on March 1 were refunded and were included in the issue of $2,098,000 of 10-year 6 per cent bonds issued at that time. The $5,098,000 additional bonds were to cover expenditures on new shops in Everett. The $1,581,000 of bonds which became due on Aug. 1, 1924, were refunded by a like amount of 10-year 5½ per cent bonds on that date. The first and refunding mortgage 4 per cent bonds of the Hoosac Valley Street Railway which matured on Sept. 1, 1924, were extended to Sept. 1, 1929, with interest at 7 per cent per annum.

As for the issues of stock sold direct to the investing public the more of these issues that are safely held by the public the better it will be for the electric railway. The investment bankers are agreed upon this. There are elements of danger, however, in such sales. This was forcefully brought out by Ralph S. Child of Bonbright & Company in his statement on customer ownership made before the New Jersey Public Utility Association and abstracted in the ELECTRIC RAILWAY JOURNAL for Dec. 6, page 967. His advice is so pertinent and so recent that it has seemed advisable to repeat in part what he said:

"It is vitally necessary to the continuance of the strong position of the public utility industry that there be no failure in the payment of dividends on the part of any company which has sold preferred stock to its customers. Should such a failure occur it would reflect on the entire industry and might bring out complications which would be very far-reaching and possibly have disastrous results."

The electric railways are looking ahead. As a matter of fact they are taking some pages out of the book of experience of the steam railroads by resorting to the use of the blanket open-end mortgage to permit financing to be carried on continually with the end in view of eventually having probably one general lien upon the property. Thus early in November creation of a $7,000,000 first and refunding issue was approved by the Worcester Consolidated Street Railway as a means of anticipating securities which mature in 1925 and at subsequent dates. Next year this company will have to meet $700,000 in maturities and within the next three years a total of $3,083,000 in maturities. This was a purely constructive move on the part of the railway in keeping up with the general financial tendency in recent years in connection with such matters, for it has been left to the directors to sell the bonds in series with different coupon rates, depending entirely upon the state of the bond market at the time the money is needed.

Among the banks and investment houses which have participated as principals in the work of placing the various issues of electric railway companies with the public during 1924 there appear the following names:

HOUSES OF ISSUE

Louisville—Fidelity & Columbia Trust Company.

San Francisco—Wells Fargo Bank & Union Trust Company; Anglo & London Paris National Bank.

New York—Dillon, Read & Company; Ladenburg, Thalmann & Company; Harris, Forbes & Company; Alexander Brown & Sons; E. H. Rollins & Sons; Remick, Hodges & Company; Paine, Webber & Company; Halsey, Stuart & Company; Federal Securities Corporation; Spencer Trask & Company; Hodenpyl, Hardy & Company; Bonbright & Company; Kuhn, Loeb & Company; the National City Company; Curtis & Sanger; White, Weld & Company; Blodgett & Company; Myron S. Hall & Company.

Philadelphia—Drexel & Company; Harper & Turner; Bown & Company.

Pittsburgh—Union Trust Company.

Hartford—Putnam & Company.

Indianapolis—Aetna Trust & Savings Bank; J. F. Wild & Company.

Detroit—Watling, Lurchen & Company.

Cleveland—Union Trust Company.

It is only fair to say that many of the facts previously set down would not have been possible to obtain except for the help of the bankers themselves. They gave freely of their time to supply facts for the article and made many constructive suggestions. In particular, acknowledgment is made to the officers of the National City Company, New York, who placed their own records at the disposal of the ELECTRIC RAILWAY JOURNAL in connection with the work of preparing the table of security issues placed with the public during the year.

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$117,000,000 Less Involved in Roads Now in Receivership

Financial Affairs of Eighteen Companies Straightened Out During the Year — Twelve Companies Thrown into Receivership — Mileage Operated by Receivers Is Decreased 338 Miles from That at End of 1923

DURING the past year the financial status of electric railways has been generally favorable. This has been reflected even in the weaker properties. In fact, the situation was so good in the earlier part of the year that it appeared that the number of receiverships for the year and the value of the securities involved would be less than for 1923. The uncertainty due to the developments of the Presidential campaign, particularly with the dire prophecies of results to follow the election of a radical candidate, caused a falling off in general business that was nation-wide. Incidentally there was a loss in electric railway traffic great enough that some of the weaker roads were unable to withstand the pressure, and receiverships resulted.

Even with the general situation as it was, the record would have been almost as good as that for last year had not application been made for a receiver for the Union Traction Company of Indiana in the closing hours of 1924. This road, an important property, which consists of 455 miles of interurbans in central Indiana, is capitalized at $26,181,000. Adding it to the list of new receiverships threw the totals, both for the amount of track and the securities involved, considerably above those for 1923. It also brought the total number of companies thrown into receivership during the year up to 12, or the same number as for the year previous.

Next to the Union Traction Company in size among those entering receivership during the year is the Michigan Railroad, which operates 159.44 miles of interurban railway in southern Michigan. The securities involved total $12,050,000. Other important roads going into receivership were the Joplin & Pittsburg Railway, with 94.52 miles of track and $10,078,500 of securities, and the Columbus, Newark & Zanesville Railway, with 91.05 miles and $6,729,000 of securities. All told, the 12 companies include 1,022 miles of track and $64,000,000 of securities.

Included along with the list of railways in receivership is listed the Charleston-Isle of Palms Traction Company, Charleston, S. C. Technically, however, this road is not in receivership as a trustee has been appointed instead. The procedure is only slightly different, however, and the road is being reorganized, so that for that reason it has been put in the table.

Contrasted with this, the financial difficulties of 22 companies were straightened out in whole or in part. In 18 of these cases the receiverships were terminated, the companies totaling 1,608 miles of track and $174,000,000 in securities. The net result of the receivership operations is thus decidedly favorable, the properties released to their owners representing nearly three times as much capital as those that went into receiverships.

The leading property to have the receivership terminated during the year was the Pittsburgh Railways. This city property, with 600 miles of track and $94,000,000 of securities, was put in such excellent condition by the receiver that it was possible to return it to its original owners without the necessity for a reorganization. In the period of the receivership, which lasted nearly 6

ELECTRIC RAILWAY RECEIVERSHIPS—1924

	Miles of single track involved	Outstanding Securities — Stocks	Outstanding Securities — Bonds	Outstanding Securities — Receivers' Certificates
United Traction Co. of Ind., Anderson, Ind.	455.0	11,500,000	14,681,000	None
Kansas City, Kaw Valley & Western Ry. Co., Bonner Springs, Kans.	42.31	73,500	1,374,500	None
Joplin & Pittsburg Ry. Co., Pittsburgh, Kans.	94.52	$7,000,000	$3,078,500	None
Milford, Attleboro & Woonsocket Street Ry. Co., Milford, Mass.	29.73	315,000	300,000	None
Grand Rapids, Holland & Chicago Ry., Holland, Mich.	76.40	1,324,700	1,500,000	None
Michigan Railroad Co., Jackson, Mich.	159.44	4,000,000	8,050,000	None
Ithaca Traction Corporation, Ithaca, N. Y.	11.47	400,000	763,000	None
Long Island Electric Ry Co., New York, N. Y.	24.97	600,000	600,000	None
Port Jervis Traction Co., Port Jervis, N. Y.	4.78	30,000	70,000	None
Maumee Valley Ry. Co., Perrysburg, Ohio.	23.21	7,500	345,000	None
Columbus, Newark & Zanesville Ry. Co., Springfield, O.	91.05	2,025,000	4,704,000	$190,000
Charleston—Isle of Palms Traction Co., Charleston, S. C.	9.00	527,000	250,000	.....
Total for 1924 (13 companies)	1,021.88	28,489,700	35,716,000	190,000

TABLE I—RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities — Stock	Outstanding Securities — Bonds
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	321,259,354	312,915,104
1920	19	1,065.31	28,758,455	72,283,575
1921	19	986.42	32,909,525	36,177,800
1922	14	695.43	18,140,150	20,304,400
1923	12	333.63	8,332,100	14,707,066
1924	12	1,021.88	28,489,700	35,716,000

TABLE II—RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

Year	Number of Companies	Miles of Track Involved	Outstanding Securities — Stocks	Outstanding Securities — Bonds	Outstanding Securities — Receivers' Certificates
1909	21	488.00	$22,265,700	$21,174,000	(a)
1910	22	724.36	19,106,613	26,374,075	(a)
1911	25	660.72	91,354,800	115,092,750	(a)
1912	18	267.18	14,197,300	10,685,250	(a)
1913	17	302.28	15,243,700	19,094,500	(a)
1914	11	181.26	26,239,700	44,094,241	(a)
1915	19	308.31	30,508,817	16,759,997	(a)
1916	19	430.14	13,895,400	22,702,300	(a)
1917	26	745.19	27,281,900	27,313,045	(a)
1918	23	524.22	37,740,325	20,149,384	(a)
1919	29	2,675.48	89,893,400	79,836,738	$42,300
1920	13	259.90	7,782,400	11,227,328	52,000
1921	13	777.97	33,642,255	30,863,526	5,000
1922	13	322.88	7,491,500	12,640,600	114,683
1923	15	927.45	118,077,959	110,638,250	12,265,000
1924	14	869.25	21,022,800	34,845,535	3,440,388

(a) Data not available.

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Table IV—Electric Railway Receiverships as of Dec. 31, 1924

Name of Company	Year of Receivership	Miles of Single Track Involved	Outstanding Securities: Capital Stock	Outstanding Securities: Funded Debt	Outstanding Securities: Receivers' Certificates
New England District					
CONNECTICUT					
Danbury & Bethel St. Ry., Danbury	1917	13.00	$320,000	$588,500	$100,000
Hartford & Springfield St. Ry., Hartford	1918	48.00	785,000	961,000	None
MASSACHUSETTS					
Connecticut Valley St. Ry., Greenfield, Mass.	1921	47.05	620,000	580,000	10,000
Northern Massachusetts St. Ry., Greenfield, Mass.	1921	44.09	500,000	500,000	40,000
Milford, Attleboro & Woonsocket St. Ry., Springfield	1924	29.73	315,000	300,000	None
NEW HAMPSHIRE					
Portsmouth, Dover & York St. Ry., Portsmouth (1)	1917	12.00	.....	707,000	30,000
VERMONT					
Barre & Montpelier Trac. & Pwr. Co., Montpelier	1920	9.75	120,000	100,000	None
Net receiverships Dec. 31, 1924	7 cos	203.62	$2,660,000	$3,736,500	$180,000
North of the Ohio and East of the Mississippi					
ILLINOIS					
Alton, Granite & St. Louis Trac. Co., Alton	1920	62.00	$3,189,000	$3,000,000	None
Chicago & Interurban Trac. Co., Chicago	1922	50.00	1,000,000	1,350,000	None
Peoria Ry. Terminal Co., Peoria	1922	11.40	1,000,000	2,444,000	None
INDIANA					
United Traction Co. of Indiana, Anderson	1924	455.00	11,500,000	14,681,000	None
Beech Grove Trac. Co., Beech Grove	1917	3.90	150,000	100,000	None
Ft. Wayne, Van Wert & Lima Trac. Co., Ft. Wayne	1921	61.63	1,000,000	1,470,000	None
MICHIGAN					
Grand Rapids, Holland & Chicago Ry., Holland	1924	76.40	1,324,700	1,500,000	None
Houghton County Trac. Co., Houghton	1921	32.15	957,200	660,000	None
Michigan R.R., Jackson	1924	159.44	4,000,000	8,050,000	None
NEW JERSEY					
North Jersey Rapid Transit Co., Hohokus	1912	18.00	800,000	800,000	None
Morris County Trac. Co., Morristown	1923	68.98	300,000	4,193,066	None
NEW YORK					
Buffalo & Lackawanna Trac. Co., Buffalo	1918	8.80	55,000	1,000,000	None
Hamburg Railway, Buffalo	1920	21.72	(2)	(2)	None
New York & Long Island Trac. Co., Hempstead	1923	50.76	1,000,000	1,000,000	None
Hornell Trac. Co., Hornell	1917	10.90	117,900	150,000	2,000
Ithaca Trac. Corp., Ithaca	1924	11.62	400,000	763,000	None
New York & Queens County Ry., Jackson Heights	1923	43.65	3,235,000	1,500,000	None
Manhattan & Queens Trac. Corp., Long Island City	1917	21.20	20,000 (3)	2,090,000 (4)	None
Brooklyn Heights R.R., Bklyn.	1919	5.12	200,000	250,000	None
Long Island Elec. Ry., New York	1924	24.97	600,000	600,000	None
Steinway Ry., Long Island	1922	31.11	None	1,500,000	None
New York Rys., New York	1919	80.00	17,495,060	48,699,175	None
Staten Island Midland Ry., New York (7)	1920	28.68	1,000,000	1,000,000	3,000
Second Ave. Ry., New York	1908	26.35	1,862,000	5,720,000	3,140,000
Ogdensburg St. Ry., Ogdensburg	1922	7.74	150,000	150,000	None
Penn Yan & Lake Shore Ry., Penn Yan	1918	8.50	94,000	100,000	None
Port Jervis Trac. Co., Port Jervis	1924	4.78	30,000	70,000	None
Westchester St. R.R. Co., White Plains	1920	17.92	700,000	168,000	17,400
OHIO					
Cincinnati, Lawrenceburg & Aurora Elec. St. R.R., Cincinnati	1913	31.67	808,900	750,000	None
Dayton, Springfield & Xenia So. Ry., Dayton	1923	27.97	500,000	422,400	None
Cincinnati and Dayton Trac. Co., Hamilton	1920	91.07	1,250,000	3,250,000	25,000
Cleveland, Alliance & Mahoning Valley R.R., Ravenna	1920	46.00	1,100,000	1,100,000	8,000
Dayton, Covington & Piqua Trac. Co., West Milton	1922	34.00	1,150,000	550,000	18,000
The Hocking-Sunday Creek Trac. Co., Nelsonville	1923	14.99	223,000	300,000	None
Columbus, Newark & Zanesville Trac. Co., Springfield	1924	91.05	2,025,000	4,704,000	190,000
Indiana, Columbus & Eastern Trac. Co., Springfield	1921	201.49	4,025,000	7,900,000	200,000
Toledo & Western R.R., Toledo (5)	1921	89.00	2,000,000	2,000,000	None
Ohio River Elec. Ry. & Power Co., Pomeroy (7)	1919	12.70	300,000	315,000	None
Maumee Valley Ry., Perrysburg (7)	1924	23.21	1,000,000	800,000	None
PENNSYLVANIA					
North Branch Transit Co., Bloomsburg	1915	30.00	500,000	532,500	83,000
Slate Belt Transit Co., Pen Argyl	1922	18.00	180,000	180,000	None
Net receiverships Dec. 31, 1924.	41 cos.	2,114.87	$67,241,760	$125,812,141	$3,686,400
South of the Ohio and East of the Mississippi					
DISTRICT OF COLUMBIA					
Washington-Virginia Ry.	1923	40.00	$2,378,300	$5,614,000	None
FLORIDA					
Jacksonville Trac. Co., Jacksonville	1919	65.00	1,500,000	3,270,200	$98,469
Pensacola Elec. Co., Pensacola	1920	24.49	1,100,000 (6)	1,721,770 (6)	None

(1) Remainder of property scrapped.
(2) Merged with Buffalo & Lake Erie Traction Company in 1906.
(3) Subscription rights only.
(4) Unfunded debt.
(5) Property has been sold, but receiver not yet discharged.
(6) Figures for total property. Railway value cannot be separated.
(7) As included in last year's report.

years, a great deal of important rehabilitation work was carried out and the road was modernized in nearly every department, so that it is today in far better condition than when it was thrown into receivership in 1918.

Another important road to emerge from receivership was the Cleveland, Southwestern & Columbus Railway, an interurban running out of Cleveland. This property was sold and reorganized as the Cleveland Southwestern Railway & Light Company. The difficulties of the Buffalo & Lake Erie Traction Company were finally adjusted, the property being reorganized after a foreclosure sale. In this case the interurban section of the road, operating between Buffalo, N. Y., and Erie, Pa., was segregated from the city property in Erie, two separate companies being formed. The Birmingham Railway, Light & Power Company and the Birmingham-Tidewater Railway, which have been in receivership since 1919, were reorganized as the Birmingham Electric Company.

The affairs of the Ohio Electric Railway, which went into receivership in 1921, have finally been wound up with the organization of the Lima-Toledo Railroad.

Of the companies which remain in receivership, the principal ones are two Missouri properties, the United Railways of St. Louis and the Kansas City Railways. The former has 461 miles of track and the latter 315 miles. Several times during the past year it has seemed probable that the roads would be restored to their owners, but each time the negotiations have been held up. Both properties have been making good showings, and in both cases large sums have been spent in rehabilitation, so that physically they are in excellent shape. It seems entirely probable that both properties will come out of receivership during the present year.

Another good-sized city property remaining in receivership is the Denver Tramway. In this case also the lifting of the receivership has been deferred. Negotiations are progressing, however, and there is some possibility of terminating the difficulties of the property. The principal difficulty has been in reaching an agreement as to the valuation between the owners of the securities and the city.

The only other property of over 100 miles included in the list is the Indiana, Columbus & Eastern Traction Company, which has been in

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receivership since 1921. This is an interurban line in Ohio and Indiana which operates over 200 miles of track. Conditions have not been so favorable in this case as in the ones previously mentioned, and it is doubtful if the affairs of the receiver who has this property in charge can be wound up during the present year.

The readjustment of transportation methods is still going on, as is evidenced by the abandonments of railway lines. Altogether 23 properties totaling 225.52 miles abandoned their tracks during the year. Nearly all of these are small interurban lines which have felt the pressure of competition with buses and private automobiles so keenly that they have not been able to make expenses and interest on the funded securities. Four of these roads were over 20 miles in length, the longest being the Milford, Woonsocket & Attleboro Street Railway of Springfield, Mass., with 29.75 miles. The other three in this classification were the Shore Line Electric Railway of Norwich, Conn., 28.22 miles; the Pennsylvania & Ohio Traction Company of Ashtabula, Ohio, 24 miles; and the Norwalk & Shelby Railroad of Norwalk, Ohio, 24 miles. These four roads comprise over half the abandoned track for the year.

The San Francisco-Oakland Terminal Railways, which was sold at foreclosure at the end of 1923, and which was included in last year's table of receiverships, did not, in fact, require the appointment of a receiver. It was reorganized early in 1924 as the Key System Transit Company.

As is inevitable in preparing statistics of this sort, information is sometimes not available to complete the tables for the year. This is particularly true in the case of roads that have passed through receivership, as the officials of the original companies as well as the receivers have ceased their duties when the receiverships terminated and turned their duties over to new owners. Information received this year shows that there were several companies whose affairs were

Table IV—Receiverships as of Dec. 31, 1924 (Concluded)

Name of Company	Year of Receivership	Miles of Single Track Involved	Outstanding Securities: Capital Stock	Outstanding Securities: Funded Debt	Outstanding Securities: Receivers' Certificate
GEORGIA					
Valdosta St. Ry., Valdosta.....	1922	5.00	50,000	1,500	383
KENTUCKY					
Owensboro City R.R., Owensboro	1923	12.50	75,000	400,000	None
NORTH CAROLINA					
Alamance Ry., Burlington (8)..	1923	8.40	60,000	120	None
SOUTH CAROLINA					
Charleston-Isle of Palms Trac. Co., Charleston.....	1924	9.00	527,000	250,000	.....
Net receiverships Dec. 31, 1924.	7 cos.	164.39	$5,690,300	$11,257,590	$98,852
West of the Mississippi					
COLORADO					
Denver Tramway Co., Denver..	1920	226.14	$6,156,300	$17,351,710	None
KANSAS					
Joplin & Pittsburg Ry., Pittsburg	1924	94.52	7,000,000	3,078,500	None
Kansas City, Kaw Valley & Western Ry., Bonner Springs.	1924	42.31	740,500	1,374,500	None
MINNESOTA					
St. Paul Southern Elec. Ry., Hastings.....	1918	17.54	658,225	425,400	None
MISSOURI					
Kansas City, Lawrence & Topeka Elec. Ry., Kansas City..	1919	12.00	250,000	400,000	None
Kansas City Rys., Kansas City.	1920	314.88	(9) 100,000	30,032,336	None
Missouri Elec. R.R., St. Louis..	1919	18.91	1,000,000	700,000	None
United Railways Co. of St. Louis	1919	460.93	41,296,000	50,690,000	4,200,000
Net receiverships Dec. 31, 1924.	8 cos.	1,187.23	$56,201,025	$104,052,446	$4,200,00
RECAPITULATION FOR UNITED STATES					
Net receiverships Dec. 31, 1924.	63 cos.	3,670.11	$131,793,085	$244,858,677	$8,165,25

(8) Property being dismantled July 1, 1924. (9) No par value. Nominal value of stock given.

Table V—Receiverships Terminated and Foreclosure Sales During 1924

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Outstanding Securities: Stocks	Outstanding Securities: Bonds	Outstanding Securities: Receivers' Certificates	Remarks
Birmingham Railway, Light & Power Co., Birmingham, Ala.	154.70	$4,232,800	$8,737,872	$397,388	Reorganized as Birmingham Electric Co.
Birmingham Tidewater Railway, Birmingham, Ala.	31.25	325,000	1,500,000	None	
Shore Line Electric Ry., Norwich, Conn.	28.22	1,000,000	2,725,000	None	Abandoned.
Chicago & Oak Park Elevated R.R., Chicago, Ill.	22.66	100,000	6,148,863	$2,210,000	Purchased by Chicago Rapid Transit Company at foreclosure sale.
DeKalb-Sycamore & Interurban Traction Co., DeKalb, Ill.	6.5	.....	.....	.....	Abandoned. Data not available.
Winona Interurban R.R., Warsaw, Ind.	70.0	750,000	2,343,700	None	Sold by receiver, reorganized as Winona Service Co.
Atlantic Shore Ry., Kennebunk, Me.	49.93	1,000,000	1,746,250	None	Sold at foreclosure sale in 1923. Receiver discharged in 1924.
Concord, Maynard & Hudson St. Ry., Greenfield, Mass.	18.15	235,000	230,000	None	Receiver discharged (Road abandoned in 1923).
Binghamton Railway Co., Binghamton, N. Y.	50.25	978,995	2,576,950	None	Receiver discharged.
Coney Island & Brooklyn R.R., Brooklyn, N. Y.	52.88	2,983,900	6,232,000	None	Receiver discharged.
Pennsylvania & Ohio Trac. Co., Ashtabula, Ohio.	24.00	.....	.....	.....	Abandoned. Data not available.
Cleveland, Southwestern & Columbus Ry., Cleveland, Ohio.	185.0	4,000,000	4,500,000	None	Sold and reorganized as Cleveland, Southwestern Railway & Light Co.
Lima-Toledo R.R., Lima, Ohio	82.90	11,000	7,254,000	None	Final portion of property of Ohio Electric Railway taken over by sale to the Lima-Toldeo R.R. Co.
Norwalk & Shelby R.R., Norwalk, Ohio.	24.00	125,000	150,000	None	Abandoned.
Northampton, Easton & Washington Traction Co., Easton, Pa.	16.8	1,250,000	200,000	$15,000	Sold at receivers sale and reorganized as New Jersey Interurban Co.in 1923. Receiver discharged in 1924.
Buffalo & Lake Erie Traction Co., Erie, Pa.	168.0	7,500,000	7,066,000	760,000	Sold at foreclosure sale and reorganized as the Erie Railways Co. and the Buffalo & Erie Railway Co.
Ephrata & Lebanon Street Ry., Lebanon, Pa.	23.0	220,000	203,000	None	Sold at foreclosure sale and reorganized as Lancaster, Ephrata & Lebanon Street Ry. Co.
Pittsburgh Railways Co., Pittsburgh, Pa.	599.75	48,263,050	45,836,190	None	Receiver discharged.
Total of receiverships terminated (18 companies)	1,607.99	$72,974,745	$97,449,825	$3,382,388	
Foreclosures but Receivers Not Yet Discharged					
Connecticut Valley Street Ry., Greenfield, Mass.	47.05	$620,000	$580,000	$10,000	Sold at foreclosure sale and property liquidated Receiver not yet discharged.
Northern Massachusetts St. Ry., Greenfield, Mass.	44.09	500,000	500,000	40,000	
Ohio River Elec. Ry. & Power Co., Pomeroy, Ohio.	12.70	300,000	315,000	None	Sold at foreclosure sale and abandoned.
Cleveland, Alliance & Mahoning Valley R. R., Ravenna, Ohio.	46.0	1,100,000	1,100,000	8,000	Sold at foreclosure sale. To be reorganized, but receiver not discharged.
Total of foreclosure sales without receivers' discharge (4 companies)	149.84	$2,520,000	$2,495,000	$58,000	
Foreclosures Without Receiverships in 1924—None					

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terminated in 1923 that were retained in the tables published in last year's Statistical Number. Among them were the Nassau Electric Railroad, Brooklyn, N. Y., with 136.1 miles of track and outstanding securities including $105,925 of stocks, $13,571,928 of bonds, and $70,000 of receiver's certificates; and the Orange County Traction Company, Newburgh, N. Y., with 20.82 miles of track and securities of $325,000 of stocks and $780,000 of bonds. The former road was returned to its owners, the Brooklyn-Manhattan Transit Corporation, in 1923. The other property was sold under foreclosure proceedings in 1923 and was reorganized as the Newburgh City & Suburban Railway. In last year's table the Denver & Intermountain Railroad, Denver, Col., was included in the list of roads in receivership. This road, although a subsidiary of the Denver Tramway, which has been in receivership since 1920, was never itself in receivership, as information received this year states.

The Aurora, Elgin & Chicago Railroad of Aurora, Ill., has not been included in the list of railways in receivership this year. This property was sold during 1922, a portion of it being reorganized as the Aurora, Elgin & Fox River Electric Company, while the third rail interurban was reorganized as the Chicago, Aurora & Elgin Railroad. Both of these are solvent, but due to claims remaining against the original company, the receiver of the Aurora, Elgin & Chicago has never been discharged. Since this latter company does not control any of the property it has been removed from the table.

TABLE VI—ENTIRE PROPERTIES ABANDONED IN 1924

	Miles of Single Track	Stock	Bonds
Gadsden, Bellevue & Lookout Mountain Ry., Gadsden, Ala.	3.1	.....	.....
Shore Line Electric Ry., Norwich, Conn.	28.22	$1,000,000	$2,725,000
Brunswick & Interurban Ry., Brunswick, Ga.	6.25	.....	.....
Caldwell Traction Co., Caldwell, Idaho	11.0	.....	.....
DeKalb-Sycamore & Interurban Traction Co., DeKalb, Ill.	6.5	.....	.....
Milford, Attleboro & Woonsocket Street Ry., Springfield, Mass.	29.73	315,000	300,000
Kansas City Power & Light Co., Carrollton, Mo.	2.0	.....	.....
Glen Cove Railroad, Far Rockaway, N. Y.	3.0	50,000	None
Great South Bay Ferry Co., Freeport, N. Y.	2.92	.....	.....
Wallkill Transit Co., Middletown, N. Y.	12.84	.....	.....
Suffolk Traction Co., Patchogue, N. Y.	11.61	.....	.....
Port Jervis Traction Co., Port Jervis, N. Y.	4.78	30,000	70,000
Goldsboro Electric Railway Co., Goldsboro, N. C.	3.5	.....	.....
Ashtabula & Lake Shore Ry., Ashtabula, Ohio	0.4	.....	.....
Pennsylvania & Ohio Traction Co., Ashtabula, O.	24.0	.....	.....
Norwalk & Shelby R.R., Norwalk, Ohio	24.0	125,000	150,000
Ohio River Electric Railway & Power Co., Pomeroy, Ohio	12.70	300,000	315,000
Pacific Power & Light Co., Portland, Ore.	5.6	.....	.....
Berwick & Nescopeck Railway, Berwick, Pa.	1.66	.....	.....
Corry & Columbus Traction Co., Corry, Pa.	4.0	.....	.....
Titusville Traction Co., Titusville, Pa.	16.71	.....	.....
Montoursville Passenger Ry., Williamsport, Pa.	5.5	.....	.....
Cheyenne Electric Ry., Cheyenne, Wyo.	5.5	.....	.....
Total for 1924 (23 companies)	225.52	1,820,000	3,560,000

The Northern Massachusetts Street Railway and the Connecticut Valley Street Railway of Greenfield, Mass., were abandoned in 1923 and sold for junk. Subsequently portions of these properties were taken over by the municipalities of Athol, Orange, Greenfield and Montague and two municipally operated companies known as the Greenfield & Montague Street Railway and the Athol & Orange Transportation Areas were formed under the laws of Massachusetts.

The Alamance Railway Company, Burlington, N. C., was not included in the list of receiverships in 1923, as it was thrown into receivership on Dec. 15, and information was not available until after the forms were closed for last year's Statistical Number. This company, which had 8.4 miles of track, was capitalized at $60,000 of stocks and $120 in bonds.

Preventing Election Day Accidents

MUNICIPAL election days in New Bedford, Mass., have been the occasion in recent years of numerous collisions between autos and street cars. These collisions for the most part have been due to the increased use of automobiles to transport voters to the polls, and the desire on the part of the drivers to make as many and as speedy trips as possible. Realizing that it would be difficult to get the automobile drivers to be more careful, the management of the Union Street Railway undertook to warn its motormen to be particularly careful on that day. On election morning two large posters were placed in conspicuous places in the carhouse, where all trainmen could see them. These signs read: "Watch the cross streets—Today is election day and autos are sailing through the streets. Let's have one election day without an accident." A sticker reading "Watch the cross streets" was pasted on the inside front vestibule window of each car, and served as a reminder to the motorman throughout the day. As a result of this simple campaign the number of accidents was reduced from eight, the average for previous years, to two, both of which were of minor importance.

Less Accidents Without Fenders in Baltimore*

ALL projecting fenders were removed from street cars of the United Railways & Electric Company of Baltimore, Md., with the approval of the Public Service Commission. Formerly fenders of the projecting type were carried on all cars, and H-B lifeguards were also installed as additional protection. A careful record has been kept, and since the removal of the projecting fenders it is the company's experience that many accidents have been avoided that formerly were caused by these fenders projecting beyond the ends of the cars, particularly at curbs and locations along the track where there are narrow curves.

The reduction in accidents since the fenders were removed May 9, 1920, is indicated in the accompanying table. While there have been minor fluctuations in the number of accidents to pedestrians from year to year, there has been a reduction of approximately one-half ever since the fenders were removed.

REDUCTION OF ACCIDENTS TO PEDESTRIANS IN WHICH FRONT END OF STREET CAR WAS CONCERNED, BALTIMORE, MD.

	With Fenders	After Removing Fenders			
Years beginning May 10	1919	1920	1921	1922	1923
Picked up by fender	179	....	....	....	....
Picked up by wheelguard	....	49	31	39	33
Rolled off of fender	2	....	....	....	....
Went under car, not picked up by wheelguard	18	13	12	21	26
Struck and brushed aside	191	141	113	120	123
Struck but not knocked down	41	14	22	12	24
Total	431	217	178	192	206
Decrease, per cent	....	50	59	55	52

It is stated that it is impossible to estimate the amount of saving due to the elimination of fenders, as the awards or verdicts in accident cases vary, but the annual saving in maintenance is estimated at $13,500.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

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The News of the Industry

Referendum Ready

Chicago Voters Will Answer Questions on Purchase of Railway Properties and Municipal Ownership

While stinging charges flew in Chicago over the traction situation created by the municipal ownership campaign, city lawyers have proceeded to work out the legal features of a referendum on the purchase and operation of transportation lines. The ballot or ballots will be presented to the voters on Feb. 24. One of the propositions is so phrased that the vote will give a direct answer to the controversial question between utility operators and public men of whether or not public ownership is discountenanced in the eyes of the people of the city.

Two Propositions Submitted

"Shall the city issue $000,000,000 in special bonds (Schwartz certificates) for the purpose of purchasing the ——— Lines?" will be the first question. In the blank it is likely that only the name of the Chicago Surface Lines will be inserted. Inasmuch as differences of opinion exist between Mayor Dever and Samuel Insull, head of the elevated lines, it is likely that the Mayor will have to drop that much of his program and admit defeat for his consolidation schemes, for no progress has been made toward getting a figure on the price of the elevated. On the other hand, engineers are fast rounding up the work of the evaluation of the Chicago Surface Lines.

The second proposition will be brief. It will simply ask the voter whether he approves of municipal operation. To carry, it must have a majority of the highest number of voters voting at the election, and if it fails the first proposition will be nullified regardless of what majority it might have. It is necessary from a legal standpoint to submit the proposals despite the fact that the city would not have actual control of the operation of the property for years.

Henry A. Blair, head of the Surface Lines, although not ostensibly campaigning, has taken several stinging shots at municipal ownership recently. Mr. Blair, seeking to help the transportation situation, had offered a plan for consolidation of elevated and surface lines, taking the city in as a partner and eventually giving it the consolidated plant by credits taken from earnings.

Mayor's Attitude Criticised

Mayor Dever is bitterly assailed by the Northwest Side Commercial Association over his recent debate with Samuel Insull. In a pamphlet issued Jan. 1, and which is entitled "The Truth About the 'L' Roads," the club's secretary says Mayor Dever signed his subway-municipal ownership message to Council in October without comprehending its meaning and that he has no facts to support his contention that Insull cannot raise $25,000,000 to finance the new elevated lines for which he is seeking franchises in the city. The author of the pamphlet, T. F. Deuther, previously had been a sharp critic of transportation lines, which he assailed as controlled by "the traction barons."

One-Man Car Case Argued

Officers of Prominent Roads in East Testify Before the Members of the Public Service Commission Sitting in Buffalo Regarding Their Experiences with One-Man Cars

REPRESENTATIVES of electric railway systems throughout the East have rallied to the support of the International Railway in its efforts to continue the operation of one-man cars on the local lines of the system in Buffalo. During the week ended Jan. 3 the Public Service Commission held a hearing in Buffalo on the application of the City Council of Buffalo to have the state utilities board abolish one-man cars in the city. The evidence was heard by Commissioners William R. Pooley, Oliver C. Semple, George R. Van Namee and Charles Van Voorhis of Rochester.

Statistics Show High Death Rate

Evidence was presented by a score of witnesses for the city, tending to show the increased number of accidents due to one-man car operation on many of the heaviest patronized lines of the city. Included in the evidence was a report issued by the United States Department of Commerce which showed Buffalo's death rate from street car accidents was the highest in the country in 1923. The list included 66 cities of 100,000 population or more and the death rate for Buffalo due to street car fatalities was 6.9 per 100,000 of population.

Among the witnesses for the International Railway were Herbert G. Tulley, president; Harry B. Weatherwax, vice-president of the United Traction Company, which operates one-man cars in Albany, Troy, Cohoes, Watervliet and other cities; Edward Dana, general manager of the Boston Elevated Railway; Clinton E. Morgan of Brooklyn, vice-president of the Brooklyn City Railroad; Edwin M. Walker, president of the Schenectady Railway, and others. Coleman Joyce, general counsel for the Mitten interests of Philadelphia and Henry W. Killeen, Buffalo, counsel for the International, appeared for the company.

President Tulley told the commission there is no reason why one-man car operation should be abolished in Buffalo. He testified that if he felt one-man cars are accident breeders, the management would discontinue them for humanitarian and economic reasons. Experience, however, he said, has shown they are safer than two-man cars. He submitted figures dealing at length with the records of accidents in Buffalo to prove his point.

Mr. Weatherwax expressed the opinion that as far as safety, adequacy of service and economy are concerned there is no other vehicle that compares with the one-man car. He said they are the only salvation of some traction companies. Taking similar periods of operation in 1920 on his lines when two-man cars were in use and in 1924 when one-man cars were operated, Mr. Weatherwax testified that accidents were reduced from 2,241 to 1,675. He said there were fewer loading and alighting accidents, but that collisions had increased from 1,054 to 1,237. He attributed this increase to the larger number of automobiles in operation today. He also testified that collisions had increased under one-man car operation, although 1,000,000 fewer car-miles were operated.

Evidence to Prove One-Man Car Operation Safe

Edward Dana, general manager of the Boston Elevated, produced records to prove that one-man car operation is safer than the two-man system in Boston. One-third of the surface lines in Boston are operated with one-man cars, he said. In 1923 there were 10,000 accidents, of which there were 230 per 1,000,000 car-miles of one-man operation and 261 per 1,000,000 miles of two-man operation in Boston. So far in 1924 Mr. Dana said there have been 8,757 accidents, or 151 per 1,000,000 car-miles of one-man operation and 278 per 1,000,000 miles of two-man operation. Mr. Dana also testified that the saving by the use of one-man cars in Boston has been about $1,000,000 annually.

Mr. Morgan of the Brooklyn City Railroad said that in the city of Brooklyn 24 per cent of all the cars on the surface lines are operated with one-man cars and that the company contemplates operating more one-man cars.

Mr. Walker went over the ground of his experience with one-man cars, particularly their use in Terre Haute, a complete one-man installation put in under his own direction.

As was explained briefly in the ELECTRIC RAILWAY JOURNAL for Dec. 13,

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the City Council of Buffalo recently enacted two measures in its movement to prohibit the operation of one-man cars on all local lines of the International Railway. This it did despite the opinion of the city law department that the ordinances are unlawful. Within 24 hours after the ordinances were enacted motorcycle police arrested eight operators of one-man cars on a charge of speeding.

The car operators who were arrested, through counsel for the railway, entered pleas of not guilty. The basis of the action by the city against the operators who were arrested is that they were running their cars in excess of 6 m.p.h., the speed which was fixed as the limit in one of the recently enacted measures.

One-Man Cars in Worcester Not a Menace

There is no reason for curtailment of the use of one-man cars by the Worcester Consolidated Street Railway, Worcester, Mass. This is the finding made by the inspectors of the State Department of Public Utilities, who recently completed an investigation of the use of one-man cars in that city. The inspectors found that only one of the eight specific complaints against cars was justified—the complaint regarding an insufficient number of electric switches. The department dismissed the petition of the Worcester city authorities asking that one-man cars be banned.

The inspectors recommended:

Stricter supervision of the operating department of the Worcester Consolidated.
Installation of car starters in the congested districts to make change and announce the routes of approaching cars.
Installation of additional electric switches.
Improved car inspection service, especially as to destination signs.
Stricter enforcement of the rule requiring conductors to announce the streets.
An arrangement for distribution of mail and papers from cars that would do away with the need for the motorman to leave the car platform.
Extended use of hand brake.
Use of change carriers by operators of one-man cars.
Extra cars from Grove Street making initial trip from city hall to use Summer Street from city hall.
Better co-operation of patrons.

The report of the inspectors has apparently satisfied Worcester for the findings have been generally accepted as satisfactory by those agencies and groups which initiated the complaint against the use of one-man cars as a menace to the safety of patrons and a factor in the complicating of Worcester's traffic problems.

The railway officials have declared they will put all the recommendations into force as rapidly as it is physically possible to do so.

The fight against one-man cars in Worcester was brought to a head by an accident in which a woman and child were killed. The City Council took up the question, with the result that a petition was filed with the Public Utilities Department voicing official opposition to one-man cars. The department immediately assigned inspectors to make an investigation. The work took several weeks. The findings made by the inspectors have been accepted by the city government without question.

Railway Officers Testify at New York Inquiry

William S. Menden, president of the Brooklyn-Manhattan Transit Corporation, and Frank Hedley, president of the Interborough Rapid Transit Company, were the witnesses on Dec. 29 and 30 in the investigation being conducted before Judge McAvoy at the instance of Governor Smith.

The testimony of both was very much along the same lines. They told in detail the reasons for the inability of the companies to give better service. Mr. Menden said that expenditure by the city of $30,000,000 to build the Nassau Street subway, complete the Fourteenth Street-Eastern line, provide adequate shop facilities and lengthen station platforms to take eight-car trains would double the capacity of the B.-M.T. system. Mr. Menden declared that expenditure of this sum, approximately one-fifth of what the city now has invested in the B.-M.T. subway system, would increase its capacity from 600,000,000 passengers a year to 1,200,000,000. All but the lengthening of the station platforms are contract obligations of the city, he said.

Other features of Mr. Menden's testimony included a declaration that lack of shop facilities had prevented the company from increasing its non-rush hour service and the assertion that lack of these same facilities had made it impracticable to buy new steel cars to substitute immediately for those now in use in the Center Street loop. Mr. Menden said that personally he did not think the use of the wooden cars constituted any appreciable hazard but that the company intended to displace them as soon as possible because of the public sentiment against them.

Mr. Hedley declared that the company's rolling stock was now being crowded to the maximum, consistent with safety, in an attempt to comply with the Transit Commission's order of two years ago, directing the company to run 360 additional trains. Because of the alleged failure of the city to supply adequate shop and yard facilities, Mr. Hedley testified, the company had had great difficulty in meeting the terms of the order and only during this year had been able to give practically complete compliance.

Mr. Hedley said that the inspection facilities had been improved during the last few years and that the shop facilities would be sufficient in a short time when the second and third additions of the Lenox Avenue shops, now practically completed but not formally turned over to the company, were put into use.

Asked why non-rush hour express service north of Times Square had not been increased, Mr. Hedley said:

Because we are crowding that rolling stock in the subway to the maximum, we are crowding it even beyond what it should be crowded in making a daily average car mileage, and if you increase that daily average car mileage in the middle of the day you will have cars that will have to be withdrawn from service that will not be ready for service during the rush hours, and it is my opinion that if we should increase today the mileage in the middle of the day we would not be able to do as well as we are now doing with the mileage during the peak load, morning and night. When you get the cars beyond a certain mileage every day, with the very limited facilities, practically void of new shop facilities, your breakdowns to car equipment increase very rapidly with the increase in mileage. The average records that we have on that show that 1 per cent increase in mileage will add about 4 per cent to the increase in car failures, because the equipment is now overloaded, and the more you overload it the more you multiply your troubles.

J. S. Doyle, assistant to the general manager, testified that a great increase in number of "car failures" and in the number of cars requiring repairs resulted from the intensive use of the company's rolling stock in an effort to comply with the Transit Commission's increased service order. He said that the number of cars requiring repair increased from 23 to 33 a day. Later he said car failures became fewer, as the company obtained more inspection facilities and improvised shop facilities. He added that although the car "breakdowns" had been reduced, the delays on the line had not been reduced and said that in his opinion this was due to the overcrowded condition of operation of the subways.

Bus Regulatory Ordinance for St. Louis Protested

It would be a breach of good faith on the part of the city of St. Louis should it enact the proposed city ordinance for the rigid control of buses prepared by C. E. Smith, consulting engineer for the city, for it would put the People's Motorbus Company, now operating over 54 miles of city streets, out of business. Robert W. Burkham, counsel for the motor bus company, so informed members of the Aldermanic committee on public utilities at a public hearing on Nov. 26. Mr. Burkham also charged that the further purpose of the bill was to make it forever impossible for any other independently owned motor bus company to operate in the city. Mr. Burkham said that the terms of the ordinance were so unfair as to the regulations, operating conditions and taxation imposed that it would be impossible for the People's Motorbus Company to accept it, and he then pointed out that the ordinance provided that the grant must be accepted immediately by the present company in full should it seek to retain the permits for bus lines it now holds.

Col. Albert T. Perkins, general manager for Receiver Rolla Wells of the United Railways, stated that the first information any of the United Railways officials had of the bill's existence was when they read in the newspapers that it had been presented to the Aldermen. He informed members of the committee that he was just as firm a believer in buses as either Mr. Burkham or Mr. Meade and three years ago had endeavored without success to obtain permission from the federal court to install bus lines. However, he stated that the buses should co-ordinate with the street cars.

Mr. Smith, the author of the bill, told the committee that he advocated the measure to protect the public against possible watered stock, if not during the present management, perhaps in the future.

The committee has taken the bill under advisement.

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Kansas Interurbans React Differently to Bus

Interurban electric lines radiating from Kansas City do not all react alike to the increasing interurban bus development. The Kansas City, Kaw Valley & Western, reaching Lawrence, Kan., has felt little effect from the bus in the towns between terminals. Lawrence, however, has turned to the bus to an appreciable extent. The towns between afford good support in both freight and passengers. Hourly service is maintained from 6:30 a.m. to 11:30 p.m. by eight trains. The competition began in October, 1923, with the completion of the hard-surfacing of the state highway. Experimental riding of buses has resulted in some return to the greater comfort of the trolleys, breaks in good weather showing prompt favoring of the rail line. This company has no present thought of joining a bus service to its rail system, holding that two sets of overhead costs would not be justified. The Lawrence round trip is $1.75 by trolley, single fare $1.08. The through-to-Topeka bus fare for Lawrence is $2.50 round trip, one way $1.25.

By way of contrast the Kansas City, Clay County & St. Joseph line is strenuously seeking to link the two types of service so as to permit a reduction of its train service. In fact, a request for permission to reduce is before the Missouri Public Service Commission. This company's Blue Bus Line is competing for the heavy bus patronage that has developed to Excelsior Springs, Missouri's internationally famous health resort.

The Kansas City, Leavenworth & Western Railway has just been awarded a bus line franchise for the city of Leavenworth and may discard its railway system there. It is not intended to run buses between the cities. The freight business of this line is excellent.

The "Hocker" electric line, the Kansas City, Lawrence & Topeka, which never has built farther than Merriam, Kan., so far has been free of bus competition and is not considering the use of buses.

Detroit Company Advertises at Radio Show

Various dealers in radio apparatus held a radio show in Detroit during November. While this show was primarily for the purpose of acquainting radio "fans" with the developments in the radio art, the Department of Street Railways considered it a good opportunity to acquaint the public with the fact that radio apparatus was being used very successfully by the Department of Street Railways.

The executives of the radio show objected at first to the D.S.R. advertising at this show, but when they had been shown that the railway had advertised the radio show at its own expense and had put posters in all the cars, the executive committee withdrew its objections and the D.S.R. displayed a poster which outlined briefly its radio activities.

The poster was 3 ft. x 4 ft. in size. It consisted of photographs of the various equipment used in making a radio call, the photographs being so arranged as to show the ordinary sequence of the call from the time the trouble was reported until the crew was actually repairing the damage. The lower half of the poster consisted of a photostat copy of the article which appeared in the ELECTRIC RAILWAY JOURNAL, issue of July 12, 1924, relating to the use to which the street railway department of Detroit puts radio in connection with its line and trouble crews.

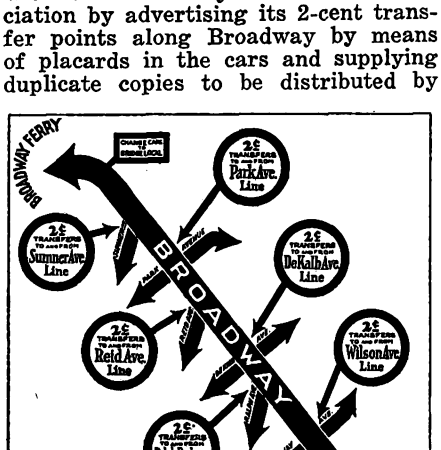
Traffic Ordinances in Effect

Two city ordinances regulating traffic in the congested district of St. Louis, Mo., have gone into effect. They provide police court fines of $5 to $500 for violation.

One ordinance prohibits, among other things, the parking of non-commercial vehicles on certain streets between 7 and 10 a.m. and 4 and 6 p.m. The other ordinance grants the Traffic Council authority to create zones and designate streets on which there shall be no parking and permits the Council to make rules deemed necessary to expedite enforcement of the ordinances.

Transfer Service Advertised in Interest of Merchants in Brooklyn

Officials of the Brooklyn-Manhattan Transit Corporation are co-operating with the Broadway Merchants' Association by advertising its 2-cent transfer points along Broadway by means of placards in the cars and supplying duplicate copies to be distributed by



Transfer Points Called to Attention of Brooklyn Riders

the merchants among customers. This is regarded as a distinctly progressive step in promoting Broadway as a leading shopping street and the merchants are said to be finding a greater response from outlying sections the residents of which were unaware of the transfer privileges.

The B.-M. T. has printed the placards with the emblem of the Broadway Merchants' Association and its motto of "Reliability." This in turn has made the merchants realize that the organization has some influence and that its aim to provide the best of service to shoppers patronizing Broadway and vicinity has been found worthy of the support of the railway.

Subway Agreement Presented in Philadelphia

Mayor Kendrick of Philadelphia, Pa., recently received the draft of an agreement between the city and the Philadelphia Rapid Transit Company for the proposed Chestnut Street subway. The document was prepared by a committee consisting of four city and three P. R. T. officials. The plan provides that the Chestnut Street subway be built at the cost of the city, with money derived from the sale of bonds. It would be leased to the P. R. T. and for 50 years the P. R. T. would both maintain the subway and pay a rental. The rental paid during those 50 years would be sufficient to meet all interest on the bonds issued by the city to pay for the subway and all state taxes, and also to provide a sinking fund which would retire the bonds. When the 50-year period ends the P. R. T. would continue to have the right to run cars in the Chestnut Street subway without any further payment of rentals. The agreement provides further that nothing in the terms of the contract would alter the agreement of 1907 under which the city has power, on July 1, 1957, or July 1 of any subsequent year, to acquire the rights and properties of the P. R. T. if it so desires. The agreement will be put before the Transit Commission, recently created by the Council. At the meeting of the Transit Commission at which the company presented its proposals regarding the subway the company asked that the line be designed by its own engineers. No mention of this suggestion was made in the draft of the proposed agreement.

An Army of Riders "16 Years Long"

The second of a series of accident prevention meetings which will last through the winter has been started by Victor T. Noonan, supervisor of accident prevention of the Chicago Surface lines. Mr. Noonan's first address in the series was "The Value of Human Life." In his remarks Mr. Noonan announced that in the first 10 months of 1924, supposedly as the result of the last year's safety work, there were 27 fewer fatalities on the lines than in 1923. The number of employees killed in the 1924 period was five as against 14 in 1923.

Indifference to perils, Mr. Noonan says, is a greater destroyer of life than typhoid fever, dynamite and fire combined. "I say, slow up your living. Don't live so fast. No nation in the world is so careless of its humanity as America."

The Chicago Surface Lines publishes the following figures:

The street railways of the United States in 1923 carried 16,000,000,000 passengers.

Mobilized four to the column, this army would extend 6,060,606 miles.

This army would encircle the globe 242 times at the equator.

Marching at 3 m.p.h., it would take 173 years or until the year 2097 A. D. to pass in review.

The Chicago Surface Lines in 1923 carried 1,461,277,888 passengers.

Mobilized four to the column (8-ft. spacing), this army would extend 553,514 miles.

This army would encircle the globe 22 times at the equator.

Marching at 4 m.p.h., it would take this army about 16 years or until 1940 to pass in review.

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St. Louis Hard Hit by Storm

Street car traffic in St. Louis, Mo., suffered severely in the storm on Dec. 18 and 19. Many lines were put completely out of business and cars on others were forced to operate behind schedule. On Dec. 18 toward evening at the very beginning of the peak-load period the temperature fell quickly and in a few hours the wires and tracks were covered with sleet. Poles of telegraph and telephone companies snapped and dragged their wires down over the tracks in some sections, while many large trees also fell. A strong wind added to the damage.

H. O. Butler, traffic manager of the United Railways, at 9 p.m. issued a bulletin that all traffic between Wellston and St. Charles, Mo., would be suspended. Some cars on this division were marooned. The Kirkwood-Ferguson division also suffered greatly. The Illinois Traction System, which operates out of St. Louis via the McKinley Bridge, was hard hit, as were the East St. Louis & Suburban Railway's city lines in East St. Louis and Alton, and the St. Louis, Columbia & Waterloo Railway.

For a time the only county division of the United Railways able to operate was a section of the Kirkwood-Ferguson line between Wellston and Brentwood. In all 60 cars were stranded on the county lines.

Superintendent Butler of the United Railways pronounced the storm the worst in 36 years. While the company succeeded in keeping most of the city lines in service between terminals there was considerable congestion.

The first sleeper out of St. Louis over the Illinois Traction System after the storm for points east and north did not leave until the night of Dec. 22. This company, however, succeeded in maintaining service on its lines from Champaign to Danville and on several branch lines out of Danville. In Springfield, Ill., tractors were used to rescue some of the stranded cars.

At Decatur, Ill., buses operated by the Illinois Power & Light Corporation worked without interruption during the storm and saved the city from complete transportation paralysis. Chauffeurs changed the usual route slightly when obstructions were encountered, but service was fairly reliable despite unprecedented difficulties. Buses are now run to every section of the city, but it was never anticipated that practically the entire load from the railway would be thrown upon them.

Steam railroads were also hard hit by the storm and crack trains were from 16 to 48 hours behind schedule into St. Louis. Few long distance telephone lines remained in service.

Mayor Suggests Conference with Portland Officials

In a letter to the City Council recently, Mayor Baker of Portland, Ore., recommended that that body confer with the Portland Electric Power Company on the matter of car extensions to districts now declared to be inadequately served. The Mayor also suggested one-way traffic for street cars and rerouting where cars now interfere with the one-way traffic plan.

One of the problems to be worked out in connection with the extension of service to new districts, the Mayor suggested, was whether the extensions should be made by car line or by bus lines. He pointed out that because of the large investment of the Portland Electric Power Company it should have the first opportunity to make the extensions. If the extensions were made by operation of bus lines, Mayor Baker declared that transfers should be issued between the buses and the street cars.

He suggested a plan be worked out by which these districts might be served without duplication of that service given by the company, and argued that any duplication would be unsound.

The Portland Electric Power Company has already indicated its willingness to use the bus in one or two other instances.

Subway Fund Only for Subways

Only expenditures specifically attached to construction of the downtown subway in Pittsburgh can be made from the $6,000,000 bond fund authorized by the people's vote. This is the substance of a ruling made by Judges James R. Macfarlane and Joseph M. Swearingen, hearing the action to restrain the city from maintaining the bureau of traffic relief from the fund. The court said:

> This ordinance is rather broad. The measure provides for the creation of the bureau of traffic relief for the purpose of making a study and investigation into the feasibility, advisability, location, and cost of traffic relief by means of a subway, or otherwise, in the First and Second wards of the city of Pittsburgh and to estimate the cost thereof, and in connection therewith to study and investigate the vehicular traffic in the downtown business districts of the city and report from time to time and recommend measures of relief both of an experimental and permanent nature.
>
> This thing might go on indefinitely and still there would be no subway.

The court made it plain that the city could use money from the bond issue which would be a legitimate expense in connection with the building of the subway, but no portion of it could be used for making an investigation into traffic problems.

Experiment with Fewer Stops in Boston

The Boston Elevated Railway recently decided to try the skip-stop plan in Beacon street for 60 days. Edward Dana, general manager, said:

> The number of stopping places per mile determines to a large extent the character of the service rendered. Service is slowed down and rapid transit prevented by observing a large number of stopping places. The cost of service also is affected by the number of stopping places. If a minimum number is provided, power consumption is reduced, other economies follow and better service may be rendered. The greatest economy as well as efficiency of service can be obtained with between four and five stops to the mile.
>
> Applying this principle to this particular line, it is estimated that a saving of $20,000 a year can be made in the cost of service. Beginning Dec. 1 the board of trustees has decided to make a trial for 60 days of the effect of reducing stopping places to the above standard between Cleveland Circle and Kenmore Street on the Beacon Street line. During this trial it will be possible to determine whether or not the service is improved and whether it is in the interest of the greatest number to continue this arrangement and extend it to other routes of the Elevated Railway.

West Penn Railway to Seek Co-operation of Civic Bodies

A movement to attract new industries to the territory covered by the West Penn System in western Pennsylvania, Ohio, West Virginia and Maryland has been started by the West Penn System in the inauguration of an industrial extension department.

The primary object of the movement is to attract additional manufacturing plants, but a specialized effort will be made to secure those of a diversified nature. It is hoped that the plan will eliminate to a certain extent the possibilities of a partial or complete shutdown of all industries at one time.

The close proximity of raw materials, economy of fuel and power, abundance of labor, unexcelled transportation facilities by rail and water and the nearness to markets are expected to prove unusually attractive to manufacturers now located in sections of the country that do not offer these combined advantages.

E. B. Glazier, industrial extension engineer of the West Penn System, will supervise the work. He will confer with the boards of trades, chambers of commerce, other civic bodies and the local industries in the various cities and towns in an effort to have them co-operate with him and furnish statistics and information regarding the particular advantages they can offer to concerns seeking new locations for plants.

Combined Ticket and Selling Agents in Brooklyn Make Good

Two ticket agents of the Brooklyn-Manhattan Transit Corporation, Miss Kathryne Roche and Miss Mary Begot, who have been on duty for some time past at the Newkirk Avenue station of the Brighton Beach line, are conducting a merchandising experiment in which they combine the duties of ticket agents for the B.-M. T. and sales agents for the Broadway Subway Advertising Company, which has the contract for advertising and vending on the B.-M. T. lines. The experiment is being made as the result of the installation of additional entrance and exit facilities for passengers at this station. Four automatic turnstiles have been installed in place of the two operated by agents.

The ticket agents now are on duty at the news-stand and make change there for passengers who are not supplied with the nickel needed to operate the automatic turnstiles. The agents have so arranged their hours that two of them are on duty from 6 a.m. to 10 a.m. on weekdays, and thus passengers will not have to wait for change during the period of maximum traffic. The two agents have an assistant who relieves them during the early morning hours, so that they provide 24-hour service in their dual capacity of ticket agents and sales agents. The experiment has been in effect since Nov. 29. It is understood to have worked out satisfactorily for the public, the agents and the companies. The agents receive a commission on the sales of papers, periodicals, cigars, cigarettes and candies, so that as they increase the sales their compensation increases.

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Loan Association at St. Louis Unusually Successful

More than 25 per cent of the employees of the United Railways, St. Louis, Mo., have been enabled to purchase their own homes through the operations of the United Railways Savings and Loan Association.

Since the association was formed in 1915 by officials of the company 1,550 members have built or purchased their homes with the assistance of the association. More than 4,000 workers have bought stock, paying for most of it on the monthly payment plan.

The success of the plan of helping the workers to help themselves is believed to have been responsible for reducing the labor turnover to a point where it is no longer a problem to the management. Among the 4,000 carmen now serving the company it is said that not one was hired or fired during a recent period of four months.

Robert Richardson, president of the association, is quoted as follows:

The satisfied employee is the one who is saving money, and the United Railways encourages every man and woman in its employ to become a saver. I find that more than one-half of our workers today own their homes, a record which far outdistances any other body of industrial workers in St. Louis.

The United Railways Savings and Loan Association, organized under the building and loan laws of Missouri, operates along the lines of a savings bank. No penalty is assessed for failure to pay dues promptly. Interest starts from the time the money is deposited and an employee needing his funds for an emergency may obtain them at any time without loss. For instance, of the worker agrees to purchase $4,000 of stock of the association at the rate of $20 a month an insurance feature provides that if he dies the beneficiary shall get the $4,000 stock paid in full.

The Employees' Mutual Benefit Association also furnishes the workers for the street railway company free medical attention for themselves and members of their families. The dues in this organization are only $3 a year.

In 1923 more than 50,000 cases of sickness were handled by the association. Hospital fees are also provided, while the family is cared for if the breadwinner is not able to work.

Riders Receive Transit Story at First Hand

Passengers on the Brighton Beach, Sea Beach, West End, Fourth Avenue and Culver lines of the Brooklyn-Manhattan Transit Corporation have received copies of a booklet entitled "Rush-Hour Relief for Passengers on Brighton Beach and Other South Brooklyn Lines." This distribution was made on Nov. 28. A similar booklet will be distributed on the Eastern District lines. The facts of the transit situation which apply particularly to this section of Brooklyn are set forth in the booklet. These facts are supplemented by a copy of the letter written by Gerhard M. Dahl, chairman of the B.-M. T., on Nov. 10 to Mayor Hylan, in which Mr. Dahl used the Mayor's statement in defense of the 1925 city budget to refute the Mayor's assertion that the transit companies in New York City can and do make plenty of money on a 5-cent fare. The distribution of this booklet to passengers is part of the B.-M.T. program of presenting the facts of the transit problem to the public.

Negotiations Over Buses Still Under Way in Kansas City

Negotiations are still in progress between the receivers of the Kansas City Railways and the city concerning regulations affecting bus transportation. The federal court is awaiting the outcome of these proceedings before issuing a final order regarding the installation of bus service by the railway. Tentative suggestions from the city officials indicate that a 3-year franchise for bus operation may be offered to the railway. A 5-year franchise was the minimum suggested by representatives of the railway.

Meanwhile a special commission on bus service, appointed by the Mayor several months ago, has made a preliminary report. The commission recommends that any bus line operating should have a permit that designates routes and stops; that interurban buses shall not enter the congested district, and that parking should be prohibited on downtown streets over which buses operate, to give them a clear way.

Binghamton Railway Tells Binghamton

In connection with the twentieth anniversary of the Binghamton *Press*, the Binghamton Railway, Binghamton, N. Y., recently ran a full page ad in the paper emphasizing the fact that a community grows no faster than its public utilities. Along with some facts about its passenger-carrying capacity and its average speed, the ad contains pictures showing the company's progress in equipment since 1886. In contrast to the 1886 model, the picture shows the railway's 1924 steel car seating forty-two passengers, the standard car adopted for present-day service.

Public Official Wants Mental Test for Every St. Louis Autoist

Major Clinton H. Fisk, director of streets and sewers, St. Louis, Mo., at a recent meeting of the St. Louis Traffic Council urged that an ordinance be passed to force every motor vehicle driver of the city to submit to a mental test in order to obtain a license to drive. At a round-table discussion of traffic problems in which officials of the United Railways, the People's Motorbus Company, taxicab and truck operators and police department officials participated, Major Fisk was assured that each of the interests represented would support a bill of this character.

Major Fisk pointed out in his talk that at present taxicab and motorbus drivers are compelled to submit to a mental test to obtain licenses, and expressed the belief that there is no valid excuse why all drivers should not be compelled to do so. He stated that a bill of that nature will be submitted to the Board of Aldermen when that body reconvenes in October.

A report read at the meeting showed that there has been an increase of 22 per cent in the number of motor vehicle accidents during the past few months despite a decrease in all other accidents.

Col. Roy Britton, president of the Automobile Club of Missouri, an organization with more than 21,000 members in St. Louis alone, is opposed to Major Fisk's plans.

Salesmen Must Not "Pass Up" Patrons

Trainmen of the Pittsburgh Railways, Pittsburgh, Pa., have been warned against the common fault of motormen in sometimes neglecting to stop for waiting patrons. The company feels it is not part of the sales philosophy to neglect a possible patron and it has brought to the consideration of all employees the duty of selling rides. The company says:

Stop and consider the fact, and it is a fact, that you are salesmen. You are engaged in selling a useful commodity—transportation. A salesman of little ability can sell what the customer must have, but it takes real ability to sell the customer something about which he is indifferent, or of the value of which he is ignorant.

Many of our patrons are not compelled to patronize our cars. They have the choice of other methods of transportation. It is our job to make transportation via the street car as safe, pleasant and speedy as possible, and so attract the greatest number of patrons. Just now we have the added incentive of a falling off in traffic, due to business depression, to spur us to increased effort to secure more riders.

These things being true, what is to be thought of the trainman who deliberately turns aside (perhaps permanently) proffered business by failing to stop his car upon signal of persons desiring to ride? We know that men who do this would not long be retained by commercial houses if guilty of such action—or rather inatcion—there.

You are salesmen! It is your duty to sell rides. When you perform this duty you will not "pass up" any person waiting to board your car. Indeed, the person not directly at the stop, but approaching it in evident haste, should be accommodated when this is practical.

Be a salesman—and a live one.

Railway Wins Track Suit

The Boston & Worcester Street Railway will not have to pay Southboro, Mass., the sum of $900 a year for 1920 and 1921 in consideration of track locations in the town, according to a recent ruling by the Supreme Judicial Court in the $1,800 suit brought by the town against the company. The Supreme Court upheld the decision of Judge Alonzo P. Weed, who found for the defendant in the Superior Court on Feb. 11, 1924. It was alleged the railway refused to pay the amount due for 1920 and 1921. The defendant claimed that the agreement was illegal and void as it was in violation of the statutes of the commonwealth. Judge Weed found that the tracks of the company in Southboro were mostly over a private way. He also found that the defendant had paid more than $900 per annum in excise tax previous to 1920, the amount levied by the town. These excise taxes were not due in 1920 and 1921 according to the statutes, the court ruled.

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Traction Company Entertains Community at Christmas

More than 4,000 people attended the fourteenth annual Christmas tree celebration conducted by the employees of the Beaver Valley Traction Company, New Brighton, Pa., on Dec. 22.

A tree, claimed to be the largest ever erected in the community, was placed in the center of an enlarged dancing pavilion in Junction Park, owned by the company. The doors were opened at 6 p.m., and from then until 2 a.m. a stream of men, women and children kept coming and going.

Children from the various institutions were guests of the employees. In addition town and borough representatives, members of the various civic and social clubs and chambers of commerce in the valley were invited.

The tree was illuminated with colored lights and a large star, formed of shaded lights, was perched in the extreme top. These were in addition to the usual decorations. Artistic effects were produced by the lighting and by pine covered with cotton so placed that the hall gave the appearance of a pine forest snow-bedecked.

Santa Claus made his entrance promptly at 8:30 in a sleigh drawn by six little folks. He was joyously greeted by the children and as his sleigh moved about the pavilion the merry crowd stormed him, insisting that he open his packs of gifts forthwith.

With Santa's help the children were formed in lines of twos and after marching once around the pavilion they were taken to the basement, where lunch was served and gifts distributed. Motion pictures were then shown in the addition to the pavilion, where the latest in funny reels was used to hold the attention of the children while the pavilion proper was being used for the festivities arranged for the adults.

C. D. Smith, general manager; Grover C. Wolfe, Mrs. C. D. Smith and Miss Elma Graham received the guests.

Winnipeg Company Likely to Expand

Further extension of the Winnipeg Street Railway, Winnipeg, Man., through adjacent municipalities is one of the projects likely to be undertaken during the administration of George W. Allen, who succeeds Sir Augustus Ganton as president of the Manitoba Power Company and the railway. Reports that the railway will voluntarily be surrendered to the city upon expiration of its franchise are declared to be unofficial. The railway has been urging a 10-year renewal and is still anxious to secure a new lease. If the city does not give notice of intention to exercise its option, the franchise will be extended automatically 5 years.

Names Day for Hearing.—The Ohio Public Utilities Commission has set Feb. 5 as the date for a public hearing on the petition of J. Harvey McClure, receiver, for the abandonment of the Dayton-Union City division of the Indiana, Columbus & Eastern Traction Company. The branch line sought to be abandoned is 55 miles long.

Special Service Announced.—The Milwaukee Electric Railway & Light Company recently introduced a "business men's limited" between Milwaukee and Oconomowoc. The response was so popular that the company has announced similar special service between Watertown and Milwaukee.

Questions Eight-Cent Fare Right.—Since Federal Judge Lewis decided that the Denver Tramway, Denver, Col., has a perpetual franchise to operate its cars on the streets of Denver, basing his decision on the agreement signed by the city and the company during 1885, 1888 and 1906, the city has stated that if such be true, then those signed agreements call for a 5-cent fare and that it will insist upon this charge. Taking this stand the city will not enter into any discussion as to the valuation. Henry E. May, the present city attorney, has presented the case before Mayor Stapleton with the purpose in view of having the Supreme Court of the United States pass upon that part of the ruling by Judge Lewis in which he says that the tramway has a perpetual franchise.

Appeals From One-Man Car Ruling.—Besides being granted an injunction which authorized the present status of one-man car operation in New Haven until Jan. 6 the Connecticut Company has filed an appeal with the Public Utilities Commission from the provisions of the prohibitory ordinance. The new ruling forbids the operation on certain streets between 6 a.m. and 10 p.m. of street cars without a conductor in addition to the operator. The appeal states that the ordinance is unreasonable and null and void and that it is discriminatory because it permits the operation of one-man cars by the New Haven & Shore Line Railway in New Haven.

Merchants Make Traffic Suggestions.—As a substitute for the short looping plan advanced recently by the Pittsburgh Railways, Pittsburgh, Pa., the Downtown Business Men's Association at a hearing before the transit conference board suggested through car routing and no parking in the central business section. Establishment of one-way streets was also proposed.

Agreement Reduces Fares.—Further consolidation of fares has been accomplished by the Chicago City Railway through the operation of an agreement with the Chicago & Joliet Electric Railway, which reduces 10 cents a day the round trip fare of passengers from southwest suburbs working or shopping in Chicago. Formerly the fare was 10 cents to the city limits and then 7 cents. The new rate is 12 cents for the combined ride, of which 7 cents goes to the Joliet and 5 cents to the city company. As evidence of payment of the consolidated fare an exchange ticket is issued equivalent to a transfer.

Hearings on Ordinance to Be Announced.—The City Council of Cincinnati, Ohio, has emphasized the differences existing between itself and Mayor George P. Carrel on the Cincinnati traction situation by permitting a proposed railway ordinance to be introduced and by adopting a resolution to relieve the special street railroad committee appointed in February, 1924, from further duties. The new ordinance was introduced by Councilman William Hess, who moved that it be referred to the street railroad committee of Council for public hearings. This motion was passed unanimously on an oral vote.

Quits Bus Service to University.—The Tulsa Street Railway, Tulsa, Okla., has found it necessary to curtail its bus service by discontinuing through bus service between the business district and the Tulsa University. The reason assigned is that the cost of operation of buses was 25 cents per mile while the receipts averaged but 10 cents a mile, causing a financial loss of more than $2,500 a month. This company attempted several months ago to secure financial relief from the Corporation Commission by a fare increase, but was refused. In establishing the property valuation as the basis for rates the commission held that the bus equipment of the company could not be taken into consideration.

Grade Crossing Plans in Preparation.—The Board of Public Works of Louisville, Ky., expects to submit plans to the railroads and Louisville Railway about Feb. 1 regarding the city-wide grade crossing elimination plan in Louisville, for which a bond issue of $5,000,000 was passed by the voters last November, and on which work is to start this year. It is planned to start with the grade crossings at Fourth and G Streets, where the Fourth Street car line crosses both the Louisville & Nashville and the Southern Railroads. It is planned to complete the elimination at this one point by 1926.

Voters Favor Trolleys.—The voters of Oxford, Mass., have gone on record as favoring trolleys over buses as a means of conveyance to Worcester, the nearest big city. The sentiment of the voters was expressed at a largely attended town meeting to act on an article which if favored would have compelled the Selectmen to issue bus permits to have conveyances run in opposition to the trolleys.

Increased Number of Witnesses.—By a consistent campaign among trainmen the Los Angeles Railway, Los Angeles, Cal., has raised the average number of witnesses per accident from less than four to approximately five during eleven months. The average number of witnesses per accident, procured by trainmen, has been compiled by the claim department and published monthly in "Two Bells," the company paper. Last November four of the five carhouses turned in an average of more than five witnesses per accident. This made the average for the system 4.92. The efforts of trainmen in procuring witnesses have been watched closely by the division superintendents.

Camden Approves P. R. T. Bridge Plan.—The plan of the Philadelphia Rapid Transit Company for operation of cars over the Delaware River bridge, submitted several weeks ago to the Joint Commission, has been approved by the City Commission of Camden at a special meeting. The Camden Commissioners reserved the right to designate the streets to be occupied by the tracks and this phase of the proposal will be considered later.

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Increased Fare Allowed.—The Crown Hill line, operating from a junction on the West Twenty-ninth Avenue line of the Denver Tramway, Denver, Col., and running to Crown Hill Cemetery, about three-quarters of a mile, has been granted permission by the State Public Utilities Commission to raise its fare from 5 cents to 8 cents. Tickets will be sold at two for 15 cents. The increase was granted because the line was operated at a loss. It is owned by the Denver Tramway.

Prepares for Bus Service in Suburbs.—The Kansas City Railways, through the receivers, is preparing to install bus service on two routes in Argentine, a suburb of Kansas City, Kan. The City Commissioners have granted a permit for the operation of these two bus lines. Transfers will be issued good on the street car lines on payment of 3 cents additional. The service is needed in Argentine because passengers have to walk over a bridge from one street car line to another. Six Mack street-car type buses are to be provided for the two routes in Argentine.

Railroads Must Protect Crossings.—Steam lines must protect railroad crossings and the street cars must stop at such crossings before proceeding, according to a ruling made by the Ohio Public Utilities Commission which has been received by P. E. O'Brien, general manager of the Springfield Railway, Springfield, Ohio. Copies of the ruling have also been received at the offices of the "Big Four" and Pennsylvania Railroads. The Springfield Railway asked for a ruling on the question as to whether or not the steam lines should protect the crossings, especially after the one-man cars are put in operation on the Springfield system. It has been the practice of the street railway conductors heretofore to "flag" the street cars at the crossings. Under the ruling the railroads will have to provide watchmen at the crossings.

Want Railway Service.—A demand for restoration of car service in Faulkner, near Boston, was voiced at a recent mass meeting in Malden. Louis Hammer, chairman of a protest committee, declared that great inconvenience had been caused the residents of Faulkner by an extra change from buses to cars due to the indirect traveling to Everett station. The lines to Faulkner were operated by the Boston Elevated Railway. The "L" substituted buses for the trolley lines. Patrons using the line now take the buses to Malden and there transfer to trolleys to reach the Everett terminal of the Elevated.

Want City-Owned Bus Line.—Citizens of the Rainier Valley who are protesting against the proposal of the Seattle & Rainier Valley Railway, Seattle, Wash., to establish a bus line on Rainier Avenue have made a counter proposal urging the city itself to establish a bus line from Thirteenth Avenue and Jackson Street to Henderson Street. At a public hearing it developed that the residents of the Rainier Valley district favor the bus line to supplement the railway, but oppose its establishment and operation by the Seattle & Rainier Valley Railway. Several months ago an ordinance was introduced in Council providing $18,000 for a city-owned bus line on Rainier Avenue, but D. W. Henderson, superintendent of street railways, declared the line could not be operated at a profit. Because of this and other opposition, the ordinance failed of passage. Some of the charges made against the railway are that the company refuses to sell school children's tickets for the same price that is charged by the city-owned lines and that the company is in default on its tax payments. The railway says that if the city established a bus line, as proposed, it would be in competition with the company on certain streets.

Company Must Furnish Reports.—As a result of an application for an increase in rates made by the Madison Railways, Madison, to the Wisconsin Railroad Commission, the company was required to furnish to that body monthly reports on the excess earnings, together with statements of the receipts and disbursements of this fund, and of the moneys realized from new capital. In its application, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, the company asked for an average minimum fare of 7 cents. This would mean a cash fare of 8 cents and sale of 17 tickets for $1. The present cash fare is 6 cents and nine tickets are sold for 50 cents. The average fare is 5.8 cents. Testimony of the company's officials divulged that the proposed improvement program would cost approximately $700,000. Spread over a period of seven years, the company must raise $80,000 a year additional funds in order to comply with the program.

Seek City Survey.—The Georgia Bus Association, Atlanta, has raised $2,000 for a survey of traffic conditions to be made by a traffic expert. The Beeler report, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 27, urged the elimination of jitneys. Jitney operators say the survey is "a brazen attempt to mislead the public concerning the real traffic situation in Atlanta."

Honors Chief at Elmira.—Employees of the Elmira Water, Light & Railroad Company, Elmira, N. Y., have a beautiful program printed on fine paper and tied with red ribbon as a reminder of a Christmas party given at Rorick's Glen on Dec. 22 in honor of Frederick Hamilton Hill, their vice-president and general manager. Mr. Hill has a more substantial reminder of the event in the form of a thoroughbred saddle horse as a token of the high regard in which he is held by his employees. About 600 people, including employees and their families, were present. A feature of the evening was the presentation of two moving pictures, "The Night Before Christmas" and "The Knight Before Christmas."

Railway Man Heads Traffic Club.—S. Russell Bowen, vice-president of the Washington Railway & Electric Company, Washington, D. C., has been chosen president of the Washington Traffic Club for the ensuing year. Mr. Bowen is counsel for the utility as well as vice-president.

Automatic Signals Will Be Used.—The Board of Public Safety, Louisville, Ky., has been empowered to go ahead with the installation of automatic or electric signal systems at street intersections without further authority from the City Council. The automatic signals, it is said, have worked better than traffic officers. They will be used at all of the congested intersections.

Makes Uniform Useful.—The Los Angeles Railway, Los Angeles, Cal., is endeavoring to increase the utility of the official uniform by making it suitable for civilian use without the conspicuous features of the official garb. Some time ago the use of brass buttons was discarded and the company insignia was transferred from the buttons to a neatly designed enamel coat lapel badge in blue and silver. The use of the badge is required only while the man is on duty. The second step to make the uniform more suitable for civilian use has been made by concealing the leather support for the pockets, without reducing the strength of the coat and trousers to any degree. The uniform is made of a good quality of blue serge.

Association Pays Claims.—The Traction and Power Mutual Aid Association, which is composed of employees of the Utah Light & Traction Company, the Utah Power & Light Company and the Phoenix Utility Company, held its annual meeting at Salt Lake City Dec. 16 and elected officers for the ensuing year. During the year 1924 the society paid death claims amounting to $2,300, and paid $2,932 sickness, accident and refund accounts to members, carrying $500 reserve and death fund for the year 1925. A surplus amounting to $8,359 was divided among the members in the form of Christmas dividends of $9.20 for each 12 months' membership.

Bill Seeks Remedy Report.—A bill calling upon the Department of Public Utilities in Massachusetts to report on the merits of several suggestions that have been made in regard to the conduct of the Boston Elevated Railway, Boston, has been filed in the Legislature by Arthur F. Blanchard of Cambridge and Van Ness Bates of Brookline. The Department of Public Utilities is asked to study the merits of a Metropolitan Transit Commission, the change from private to customer ownership, joint ownership by the public, assessments upon real estate to cover improvement charges, and of having the directors of the Boston Chamber of Commerce appoint public trustees.

Electricity in Harbor Activities.—Two electric engines for use in harbor shunting and hauling activities were brought to Montreal recently and are now being assembled in local workshops. They are the product of the English General Electric Company and are the first of several which will replace the steam engines used hitherto. With the complete electrification of the Harbor railway system of more than 20 miles in full operation in the spring of 1925, Montreal, it is said, will not only be the quickest loading and unloading port in the world, owing to the shortness of the local season, but will also be the cleanest.

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Financial and Corporate

G. E. Relinquishes Utility Holdings

New Company Will Take Over General Electric Interests and Distribute Shares to G. E. Holders

The General Electric Company announced on Dec. 30 that it will dispose of its holdings in the Electric Bond & Share Company by organizing a new corporation with an authorized capital of 1,802,870 shares of no par value stock and by transferring to the new corporation 300 shares of 6 per cent cumulative preferred stock of the Electric Bond & Share Company. This stock has par value of $30,000. The General Electric Company will also transfer 250,000 shares of common stock of the Electric Bond & Share Company, being the entire common stock, having par value of $25,000,000, and now paying 8 per cent dividends.

In consideration of the transfer the new corporation will distribute its shares to stockholders of record of the General Electric Company as of Jan. 15, 1925, ratably in the proportion to their holdings; that is to say, one share of stock of the new corporation to each General Electric share.

The distribution will be made on Feb. 1, 1925, or as soon thereafter as possible, when certificates for shares of the new corporation will be mailed to all General Electric stockholders.

Dividends on the new stock will accrue after Jan. 1 and will be paid quarterly by the new corporation on the 15th day of April, July, October and January.

The present dividend rate on the Electric Bond & Share stock will justify the new corporation in paying dividends of not less than $1 a share annually.

The General Electric Company owns all the common stock of the Electric Bond & Share Company, which in itself is a holding company. Among the companies owned by the Electric Bond & Share Company either directly or indirectly are the American & Foreign Power Company and its subsidiaries, the American Gas & Electric Company and subsidiaries, the New Orleans Public Service, the Dallas Railway, the Memphis Street Railway, the Birmingham Electric Company and the Utah Light & Traction Company.

The assets of the Electric Bond & Share Company as of Dec. 31 last year were valued at $62,552,380. The company had a working capital of $24,764,782. The income of the company in 1923 was $46,546,411 gross and $30,422,561 net. It had a surplus of $14,522,380. A statement of the reasons for the change says in part:

> At the beginning of the electrical industry in the United States, it was necessary to assist in the establishmnet of electrical public service enterprises, not only in respect to engineering involved in construction, but particularly in rendering aid in financing the capital requirements of such undertakings. The General Electric Company and its predecessor companies—the Thomson-Houston Electric Company and the Edison General Electric Company—under the far-seeing and courageous leadership of C. A. Coffin, were active in this field.
>
> In order to co-ordinate these activities and render its assistance to the industry more effective, the management of investments of this character was concentrated principally in the Electric Bond & Share Company, the common stock of which has always been owned by the General Electric Company.
>
> The Electric Bond & Share Company, organized in February, 1905, has grown in size and effectiveness. It was an important factor in improving central station efficiency, in reducing cost of electric service to the public and interesting a larger number of investors in the advantages of securities in this field.
>
> The conditions in the electrical industry have changed; the public now recognizes investments in electrical public service enterprises as of demonstrated safety and stability. In view of these changed conditions the principle of separating the Electric Bond & Share Company from the General Electric Company has been under consideration for a long time, and today the board of directors took action determining the method of accomplishing it.
>
> The administration of the Electric Bond & Share Company will continue under the presidency of S. Z. Mitchell, to whose able, alert and resourceful leadership its conspicuous success and prosperity is in a great measure due.

Boston Has Its Biggest Day

Edward Dana, general manager of the Boston Elevated Railway, says that Dec. 20 was the biggest day in total receipts in the history of the company. Statistics just compiled show the railway turned the corner in November with $115,031 excess of receipts over cost of service. Receipts from fares on Dec. 20 were $126,558. The previous high mark was two years back with $124,718.

Revenue passengers carried in November were 24,479,948 at a 10-cent fare, 2,131,663 at a 5-cent fare and 4,121,992 at a 6-cent fare. Last year in November 24,240,628 passengers were carried at a 10-cent fare and 8,659,323 at a 5-cent fare. The totals for November were 30,733,603 in 1924 and 32,899,951 in 1923. Whether the falling off in the total number of passengers carried in November, 1924, was due to the increase of 1 cent in the fare on some of the lines could not be ascertained. There was a loss of 2,166,348 revenue passengers last November, despite the fact that 239,320 more 10-cent fares were collected. The total number of 5-cent fares in November, 1923, was 2,405,668 more than the number carried at 5 and 6-cent fares combined for November, 1924.

Receiver for Union Traction Company of Indiana

On the application of the Westinghouse Electric & Manufacturing Company, a creditor for $74,192, Arthur W. Brady, president of the Union Traction Company of Indiana, operating 454 miles of interurban and city electric railway in Indiana, was appointed receiver for the Union Traction Company in the Madison Circuit Court late on Dec. 31. It is alleged the traction company is in danger of insolvency.

Financial Readjustment Planned

Company at Columbus, Ohio, with Future in Mind Would Revamp Capital Structure

A refinancing plan is proposed for the Columbus Railway, Power & Light Company, Columbus, Ohio, to be submitted at the annual meeting of the stockholders on Jan. 27. Under it between $6,000,000 and $8,000,000 would be added to the present amount of stock.

A financial structure which will probably take care of the company for the next 20 years will be provided, according to President Charles L. Kurtz. He explained that action should be taken in order to tighten up the present structure.

Bonds of the company now outstanding amount to 58 per cent of the total of outstanding securities. If the new plan is adopted, present outstanding stock will be retired and supplanted by a new series, provided the Public Utilities Commission gives its sanction.

Funds secured from the sale of the $6,000,000 or $8,000,000 of stock would be used to replenish capital reserves which have been depleted by improvements completed during the past four years.

At present the company is engaged in the construction of a new power plant about 8 miles from Columbus. This is really a charge to capital.

The company now has a capital stock of $15,145,000, consisting of 60,800 shares of common stock, 19,138 shares of prior preference preferred stock, 21,125 shares of preferred stock, series A, and 50,387 preferred, series B, of par value $100 each.

According to the plan devised, series A preferred, of which there are 21,125 shares of a par value of $100, drawing dividends of 6 per cent, would be redeemed with an issue of first preferred of the same par value and bearing the same dividend.

Series B, a 5 per cent issue, with a provision of an additional 1 per cent after 5 per cent has been paid on the common stock, would be retired with a new series B, carrying 6 per cent dividends. Of this issue, only enough to retire the present series B, approximately $5,030,000, would be sought.

To take the place of the present common stock, which has a par value of $100, and of which there are 60,800 outstanding shares, it is planned to obtain authorization of 300,000 shares of common stock, no par value, to be exchanged at the ratio of two for one.

First preferred will be used to take care of further expansion, for which an authorization of $25,000,000 would be sought. This stock and the common stock remaining, after the present series is retired, would be used for future financing. No more first preferred can be put on the market if stockholders of more than one-fourth of the stock outstanding disapprove by vote.

In explaining the new plan to the stockholders Mr. Kurtz said:

> Sufficient funds for the company's needs cannot be raised by the sale of bonds. The only alternatives then for the raising of sufficient funds for the company's needs are:

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(a) The sale of debentures, the security for which would be ahead of the rights of all stockholders. These debentures would have to be refinanced from time to time and might prove very embarrassing to the company in the future.
(b) The sale of preferred and common stocks. This latter is the plan recommended to the stockholders and the one to be considered at the coming meeting.

I. C. C. Approves Key System Valuation

The Interstate Commerce Commission has approved the method of valuation submitted to it by the Key System Transit Company, Oakland, Cal., which fixes the valuation of the federal body upon its properties. The definite figure will not be known for some time, but according to President C. O. G. Miller the valuation will be considerably in excess of the par value of all securities issued, including common stock. The total of outstanding securities is in excess of $27,500,000.

The Key System was reorganized in June, 1923, succeeding to the ownership and management of an extensive transportation system which had been in operation for many years. Six months ago, in an official statement, President Miller stated that "the present depreciated reproduction value, based upon 1918-1923 average prices of the properties comprising the system, including properties of subsidiary companies which comprise less than 11 per cent of the system's mileage, is placed at $31,900,000, which is more than two and a half times the par value of the total bonded debt, including bonds of subsidiaries."

The company's capitalization at that time included: $2,965,000 divisional and underlying bonds; $1,365,810 general and refunding mortgage, 1938, series A, 6s; $7,585,200 general and refunding mortgage 1938, series 1, 5 per cent; $2,500,000 Key System Securities Company 6 per cent collateral trust 1933 notes; $5,872,891 prior preferred 7 per cent cumulative stock; $3,699,691 7 per cent preferred cumulative; $3,262,500 common stock.

Connecticut Road to Lift Receivership

A basis for reorganization by the bondholders of the Hartford & Springfield Street Railway, Warehouse Point, Conn., is being laid in a petition to be presented to the incoming General Assembly for the chartering of the Hartford & Springfield Transportation Company.

The latter company, according to its petition, wishes "the right to acquire all or any parts of the rights, franchises and property of the Hartford & Springfield Street Railway, the Windsor Locks Traction Company and the Rockville, Broad Brook & East Windsor Street Railway, including the lines of railway now owned and operated by said companies, together with the right to operate buses in accordance with the laws of the State of Connecticut."

The company has been in receivership for several years with Harrison B. Freeman as receiver. Mr. Robinson said on Dec. 27 that the experience of the receiver seemed to indicate that the property could be operated at a profit.

Purchase Talk Revived at San Francisco

John A. McGregor, chairman of the municipal committee at San Francisco, Cal., which is considering the question of the purchase of the Market Street Railway, states that the city is ready to take up final negotiations. At a meeting which will probably be held this month the city price is expected to be made known. It is understood the city offer will be on a payment from earnings basis. Appraisal figures have been compiled with company co-operation but are being held secret.

New Financial Plan Proposed for Northern Ohio Electric

A plan of reorganization of the Northern Ohio Electric Corporation is being submitted to the stockholders providing for the formation of a new company to be called the Northern Ohio Power Company, which will issue bonds and stock and raise the necessary funds to pay the $2,680,000 loan that matures on Feb. 1, 1925. The new company will take over the assets of the present company, consisting chiefly of practically the entire outstanding $10,000,000 common stock of the Northern Ohio Traction & Light Company, which operates the city lines in Akron and an extensive system of interurbans.

The new company is to have the following capitalization:

$2,800,000 (which may be increased to $3,500,000 upon exercise of options) 10-year 7 per cent bonds due Feb. 1, 1935. To be secured by pledge of practically the entire outstanding $10,000,000 common stock of the Northern Ohio Traction & Light Company.
430,000 shares of an authorized issue of 500,000 shares of capital stock without par or face value.
70,000 options expiring Aug. 1, 1926, each ten options calling for delivery of $100 bond and 10 shares of capital stock upon payment of $100.

The plan provides for the deposit of the outstanding 60,000 shares of preferred and 75,000 shares of common stock of the Northern Ohio Electric Corporation for exchange for capital stock of the new company on the basis of:

For each share of preferred stock of the Northern Ohio Electric Corporation there will be delivered two shares of the capital stock of the new company.
For each share of common stock of the Northern Ohio Electric Corporation there will be delivered four-tenths of a share of the capital stock of the new company.

The depositing stockholders are offered for subscription:

$2,800,000 10-year 7 per cent bonds.
280,000 shares capital stock.
70,000 options.

These are to be in amounts of $100 or multiples thereof on the following terms:

$100 bonds.
10 shares capital stock for the sum of $100
2½ options.

Preferred stock depositors are entitled to prior right to subscribe pro rata with secondary right to common stock depositors subject to allotment.

A 10 per cent payment must accompany all subscriptions; 15 per cent to be paid when the plan is declared operative, 25 per cent each in two, four and six months thereafter, interest at 6 per cent to be adjusted at the time of final payment.

The entire subscription has been underwritten for a commission of 5 per cent, thus assuring the receipt of funds necessary to pay the $2,680,000 loan due Feb. 1, 1925. Upon exercise of the 70,000 options, the new company will be provided with $700,000 additional capital.

Interest Defaulted by Michigan Electric Railway

The Michigan Electric Railway, Jackson, Mich., was unable to pay the six months interest due Jan. 1 on its first and refunding mortgage 5 per cent bonds. The following protective committee has been appointed:

Willard V. King, chairman of the advisory board of the Irving Bank-Columbia Trust Company; Livingston E. Jones, president of the First National Bank of Philadelphia; J. Peyton Clark, engineer; George R. Cottrelle, Toronto; Marvyn Scudder of Marvyn Scudder & Company; Noah MacDowell, representing Investment Registry, Ltd., London; William F. Ingold of Pynchon & Company; W. M. Flook, New York; Sydney W. Noyes, vice-president of the New York Trust Company, and Bernard C. Cobb, vice-president of Hodenpyl, Hardy & Company, Inc.

North Shore Road Calls Securities for Redemption

Notice has been served by the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., that it is prepared to redeem all of its outstanding series "A" 10-year secured sinking fund gold notes dated June 20, 1920; all of the outstanding series "B" 15-year secured sinking fund gold notes dated June 1, 1920, all of the outstanding series "C" 3-year secured sinking fund gold notes dated June 1, 1920, and all of the outstanding 1-year 6 per cent gold notes dated June 16, 1924.

Arrangements to carry out this refunding were recently made by the company through the sale to the National City Company and Halsey, Stuart & Company, Inc., of an issue of $7,000,000 first and refunding mortgage bonds dated Jan. 2, 1925, and due Jan. 1, 1955. As noted in the ELECTRIC RAILWAY JOURNAL for Dec. 20, 1924, page 1058, these bonds bear 6 per cent interest. They were offered to investors at 98 and interest to yield 6.15 per cent.

New Financing Proposed by Boston Elevated

The Boston Elevated Railway, Boston, Mass., has petitioned the Public Utilities Department for authority to issue $2,141,000 of 6 per cent bonds, for a term of thirty years, to pay the short term indebtedness incurred in certain capital improvements in connection with the South Boston power plant, the Everett repair shops and the Forest Hill plant and to finance expenditures necessary to be made to permit the use of the Shawmut branch, so that it may be able to borrow money on favorable terms for the rolling stock for that branch. There is provision for this plan in the special legislation enacted last year. The Public Utilities Department has held a hearing on the petition. No opposition to the plan developed.

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$200,000 Equipment Trust Issue by New York Interurban

Another issue of equipment trust obligations is being offered. The issuing corporation is the Buffalo & Erie Railway, the successor to part of the property of the old Buffalo & Lake Erie Traction Company, sold under foreclosure some time ago. The total amount of the issue is $200,000. The offering price of the bankers, Bown & Company, ranged from 100 and interest to 100¾ and interest, to yield 4¾ to 6 per cent, according to maturity. The financing has been approved by the Public Service Commission of New York. The equipment on which the certificates are a lien include 14 double-truck passenger cars, four single-truck passenger cars, and two Russell snow plows. The equipment is estimated to cost $285,000, or more than 142 per cent of the face value of the certificates. It is explained that the 18 new cars, being built by the Cincinnati Car Company, are of the so-called "Lexington" type. The certificates mature semi-annually at the rate of $10,000 between June 15, 1925, and Dec. 15, 1934.

Company Named to Acquire Stock.—The Associated Gas & Electric Company of New York, it is stated, plans to acquire the outstanding preferred and common stocks of the New Hampshire Electric Railways, Haverhill, Mass., one of the principal companies of which is the Massachusetts Northeastern Street Railway, operating 127 miles of line. A committee of stockholders was recently formed to arrange a sale of the preferred and common shares. An offer of $32 a share for the preferred and $3 for the common was referred to previously in the ELECTRIC RAILWAY JOURNAL.

Payment on Tax Made.—First payment on $437,500 which the Cincinnati Traction Company, Cincinnati, Ohio, owes the city of Cincinnati as franchise tax from Oct. 1, 1923, was received by the City Auditor on Dec. 27. The check was for $350,000. Officials of the traction company announced that another $87,500 would be paid before Jan. 15. The voucher recited that the amount was borrowed under legal authority and would be repaid during 1925, one-twelfth monthly, with interest out of subsequent gross receipts.

Another Move Toward City Purchase.—Final authority to purchase the equipment of the New York & North Shore Traction Company, Roslyn, L. I., for $17,650 has been granted by the Board of Estimate of New York City to William Wirt Mills, Commissioner of Plant and Structures. Before the city can go ahead with its plans to operate the line between Flushing and Whitestone certain private rights of way must be purchased. So far no action has been taken on this matter.

Youngstown Company Doing Better.—Figures presented recently show that the railway situation in Youngstown, Ohio, is improving since the jitneys were barred from the center of the town. The first seven days after the jitneys stopped running, street car receipts increased at the rate of $19,000 a month. The prospect now is that December will not show a loss. For the entire year, however, the loss will be between $200,000 and $220,000. Last year it was $208,000. In discussing the affairs of the Youngstown Municipal Railway the *Vindicator* in its issue of Dec. 12 said that with the jitneys abolished the expectation is that in 1925 the railway system will pay its own way. Incidentally, it has been arranged for the return of the North Avenue power house by the Municipal Railway to the Pennsylvania-Ohio Electric Company for $600,000, this amount to be deducted from the capital valuation of the municipal lines. In addition new equipment will be installed at a cost of about $200,000 by the Pennsylvania-Ohio Electric Company at North Avenue. The improvements will include a new substation and entirely new switching facilities.

Approves Interest Payment.—Federal Judge Faris has approved the application of Rolla Wells, receiver of the United Railways, St. Louis, Mo., to pay $1,212,000 interest on the issue of $30,300,000 of United Railways 4 per cent bonds. The interest dates are July 1, 1924, and Jan. 1, 1925. Judge Faris failed to act on the request of Receiver Wells to refund holders of St. Louis Transit Company bonds $624,000 which they paid in July on the interest due on the general bonds on Jan. 1, 1924. This latter payment was opposed by Rhodes E. Cave, attorney for the holders of the general 4s.

Assessment Higher.—The board of equalization on taxes after conferences with the Louisville Railway, Louisville, Ky., reached a conclusion regarding assessment of company property. It was fixed at $12,924,633. This is $1,034,633 more than last year and $934,633 more than the assessment of two years ago, which was the first under the 7-cent fare.

$5,000,000 Stock Offered.—The United Light & Railways Company of Delaware recently offered a new issue of preferred stock, incident to acquiring control of the Continental Gas & Electric Corporation, which recently took over the Kansas City Power & Light Company and the Columbus Railway, Power & Light Company, Bonbright & Company are placing the issue, which consists of $5,000,000 of 6½ per cent cumulative prior preferred. The United Light & Railways Company is controlled, through the ownership of all its common stock, by the United Light & Power Company, a Maryland corporation, which controls and operates a group of properties furnishing various utility services in 97 Middle West communities. The new prior preferred stock issue has a par value of $100 a share and will be acceptable at par in payment for class A common stock of the controlling company, the United Light & Power Company at $50 a share up to March 1, 1925; at $55 a share thence to March 1, 1927, and at $60 a share thereafter up to and including March 1, 1929.

Pays the City.—The Denver Tramway, Denver, Col., has paid the city of Denver $162,323, back franchise taxes. Under a court ruling the receiver must pay this $5,000 tax every month.

November Shows Surplus.—The report for November of the Tacoma Municipal Street Railway, Tacoma, Wash., showed a balance in favor of the city for the first time since the year 1918. The gain was $26. Operating revenues, the report showed, were $5,463, with operating expenses $3,256. Claims, charges, depreciation and interest on bonds used up the remainder of the surplus. This bears out the claims made for the belt line by the traffic bureau of the Tacoma Chamber of Commerce. A careful analysis of the November business shows that of the 680 cars switched by the belt line during November, only 472 would have been switched by the municipal line under former conditions.

Part of Route Abandoned. — The Geneva, Seneca Falls & Auburn Railroad, Inc., through L. G. Hoskins, attorney, Geneva, N. Y., has filed a certificate in the office of the Secretary of State at Albany declaring a portion of its route of about a mile on Stevenson Street abandoned.

On Board of Trustees.—George P. Bullard, Newton, was recently appointed by Governor Cox to fill the vacancy on the board of trustees of the Eastern Massachusetts Street Railway, Boston, Mass., caused by the resignation of Isaac Sprague, Wellesley.

Vote to Increase Capital Stock.—At a special meeting of the stockholders of the Cumberland County Power & Light Company, Portland, Me., which operates the Portland Railroad, it was voted to increase the outstanding capital stock of the company by an issue of 6 per cent preferred stock not to exceed $500,000 in amount. This proposed issue will go before the Public Utilities Commission for approval. It was also voted by the stockholders to authorize the directors of the company to arrange for the exchange of any such preferred stock at par for any of the $500,000 of 4½ per cent first mortgage consolidated electric light company of Maine bonds, falling due Jan. 1, 1925, or to arrange for the sale of such stock or any portion of it which may be deemed necessary to apply toward the payment and redemption of any portion of the bond issue. The stockholders also ratified and approved of the action of the directors in causing to be offered to its common stock holders of record Nov. 22, 1924, the privilege of subscribing at the rate of one share for ten of existing holdings to non par value common stock at the price of $75 per share.

Reading Company Changes Its Name.—W. S. Barstow & Company, New York, announce that the name of the Reading Transit & Light Company, Reading, Pa., subsidiary of the General Gas & Electric Corporation, has been changed to the Reading Transit Company. The new company is offering, through its investment department, $1,250,000 of first and refunding mortgage 30-year 5 per cent gold bonds, series A, due Nov. 1, 1964. It also has arranged to pay the $400,000 first mortgage 5 per cent 30-year gold bonds of the Reading & Womelsdorf Electric Railway. The holders of these bonds have the privilege of exchanging them for the new issue of Reading Transit 6s.

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Legal Notes

FEDERAL COURT—*Constitutionality of Rate Statute.*

It is within the power of a legislature to prescribe the form of charges by a gas company, so that a statute prohibiting a "service charge" is in itself constitutional and valid. But a law passed by the New York Legislature in 1923, relating to the price and quality of gas as furnished by gas companies in New York City (cc. 898,899) is confiscatory and therefore unconstitutional, as applied to the companies considered. [New York & Queens Gas Company vs. Prendergast 1 (2d) Federal Rep., 351, also Bronx Gas & Electric Company vs. Prendergast et al, 1 (2d) Federal Rep., 377.]

FEDERAL COURT—*The Paving Clause in a Franchise Is a Contract.*

This case arose through a plea by abutting property owners that the railway operating in a street should be required to do the paving specified in its franchise. The court held that the ordinances of a city may be local laws or they may constitute contracts. Where a franchise is accepted by a utility it constitutes a contract. Hence, the suit in question is not one to require the defendant to perform a public duty required by law but for specific performance of a contract. [State of Washington et al. vs. Seattle & R. V. Ry. 1 (2d) Federal Rep., 605.]

GEORGIA—*Duty to Passenger Occupying Dangerous Position.*

A railway company has a right to prohibit passengers from occupying positions on its cars considered to be dangerous, except at their own risk, but when passengers are permitted and in some instances required to occupy such positions, the company is under the duty to exercise extraordinary care and diligence for their safety. Hence, when a passenger, standing on the steps of a car, is struck by an automobile caught in a rut close to the railway right-of-way, the company is responsible. [Bailey vs. Georgia Ry. & Power Co., 124 Southeast Rep., 907.]

KENTUCKY—*Person Riding on Running Board of Automobile Not Negligent.*

A person riding on the running board of a crowded closed automobile with his head in the window is not necessarily negligent in so doing, and if injured by a street car while so riding, the company is responsible. [Paducah Railway vs. Nave, 265 Southwest. Rep., 289.]

MASSACHUSETTS—*Improperly Registered Automobile a "Nuisance."*

The owner of a touring car removed the body and put on a truck body, for temporary purposes, without changing the registration or license plate. As the result of a collision with another automobile, the changed car fell into an excavation made by a railway company. The defense of the latter was that the owner of the automobile was a trespasser, without right upon the highway because his automobile was not legally registered. This position was upheld by the court. [Nichols vs. Holyoke Street Ry., 145 Northeast Rep., 33.]

MASSACHUSETTS—*Person Slipping on Step of Station.*

Where a passenger slips on some slippery substance on the step of a station, and where there is no evidence as to what the substance was or how long it had been on the step, the company cannot be considered to have been negligent. [O'Brien vs. Boston Elevated Railway, 145 Northeast. Rep., 259.]

MICHIGAN—*Injury to Passenger While Acting as Witness to Accident.*

A passenger who witnessed an accident was injured while standing by the side of the trolley car and signing his name to a witness slip at the request of the conductor. The company was held responsible for him as a "passenger" although the conductor had not invited him to leave the car. [Moffatt vs. Grand Rapids Railway, 200 Northwest. Rep., 274.]

MISSOURI—*Employees Alighting in Middle of Block.*

It is negligent for a motorman to open the platform door between customary stopping points and to allow a trainman to get off at such point, and when such alighting trainman stepped in front of or directly against a boy riding a bicycle and caused him to fall under the wheels of the car, the company was responsible. [Gilman et ux vs. Fleming et al, 265 Southwest. Rep., 104.]

NEW JERSEY—*Damages from Collision Between Truck and Street Car, Where Both Were Probably Driven Negligently.*

In this case a street car and loaded truck ran into each other through what was probably negligent driving of both. A passenger on the trolley car, who was injured, sued both trolley company and truck owner, and the decision of the jury against only the trolley company was sustained. [Doherty vs. Public Service Ry. et al, 126 Atlantic Rep., 466.]

NEW JERSEY—*Testimony of Physician Not Always Admissible.*

Declarations by a patient as to his symptoms, made to his physician for the purpose of treatment, are admissible in evidence, but where the statements are made on the day preceding the trial for the sole purpose of enabling the physician to testify at the trial as to the plaintiff's symptoms, as described by him, the testimony is hearsay and inadmissible. [Hutchinson vs. Jersey Central Traction R. Co., 126 Atlantic Rep., 482.]

NEW JERSEY—*Responsibility at Crossing Determined by Jury.*

In this case the railway operated over a private right-of-way close to the highway and passed cross streets at grades. A motorcycle rider was struck while attempting to cross in front of a car at a cross street and three juries awarded the plaintiff damages. Two of these awards were set aside, but the court allowed the third verdict to stand. Death of the plaintiff in the meantime did not abate the action. [Hutchinson vs. Jersey Central Traction R. Co., 126 Atlantic Rep., 481.]

NEW JERSEY—*Riding with Intoxicated Automobile Driver. Degree of Care Required of Motorman.*

The plaintiff in this case was riding as a passenger in an automobile when he was injured by a trolley car. There was a verdict for him against the railway company in a lower court, but the Supreme Court upheld two grounds for appeal. One was the defense that the plaintiff was guilty of contributory negligence because he knew that the man driving the automobile was intoxicated. In developing this defense, defendant's counsel asked a witness if the driver was under the influence of liquor, but the court sustained an objection to this question, saying the witness would have to qualify as an expert. This was held by the Supreme Court to be erroneous, as ability to recognize such condition does not require special knowledge or skill. The other ground of appeal upheld was that the court charged that the defendant was liable if the jury believed the motorman could have stopped the car before striking the automobile after seeing it. This charge was held erroneous because the test was whether, in the exercise of reasonable care, he ought to have stopped it and could have stopped it. [Searles vs. Public Service Railway, 126 Atlantic Rep., 465.]

TENNESSEE—*Paving Ordinance Valid for Track in Easement.*

Where a deed conveyed a strip of land to a county for use as a public road or street, but subject to a 20-ft. "easement" to a street railway company for its tracks, it was held that the title to the ground included in the easement vested in the county. Consequently, after a city was incorporated, it had the power to require the company to pave between and alongside its tracks. [City of Memphis vs. Elgin, 299 Federal Rep., 564.]

TEXAS—*Necessary Protection at Highway Crossing on Interurban Railway.*

In the absence of statutory requirements, an interurban electric railway need not maintain a watchman, electric bell or gate at a crossing, unless it is unusually dangerous. The operation of an electric car over an unobstructed highway crossing in the country at 60 m.p.h. does not constitute negligence. If the consent of the county authorities is required before such a track can be built across a public road, the failure of the company to obtain such consent cannot be regarded as the approximate cause of a collision with a motor vehicle at the crossing, as trespass on the highway would constitute a nuisance, of which only the public could complain. [Smith vs. Galveston-Houston Electric Railway, 265 Southwest. Rep., 267.]

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Personal Items

Duties Realigned

Louisville Officials Promoted by Board of Directors—Title of General Manager Conferred on F. H. Miller

Frank H. Miller, vice-president in charge of engineering and maintenance of the Louisville Railway, Louisville, Ky., was made vice-president and general manager of the company Jan. 1. Samuel Riddle continues as vice-president in charge of transportation of the Louisville Railway. R. H. Wyatt, general superintendent of the Louisville & Interurban Railway, a subsidiary of the Louisville Railway, has been named acting manager of that company. These changes, announced recently by President James P. Barnes, were made merely to simplify operation of the company. The title of general manager is a new one. Both Mr. Miller and Mr. Wyatt will have authority over operating and maintenance departments.

New Executives Men of Wide Experience

Mr. Miller, the first official of the company with the title of general manager, has been with the Louisville property since the fall of 1895. He started in the car repair shops and occupied the positions successively of timekeeper, storeroom man, car tester, truck repair man, assistant superintendent of the power station and then superintendent of power. When James P. Barnes became the president of the Louisville Railway in 1920 Messrs. Miller and Riddle assumed the duties of vice-presidents. It was said in the JOURNAL at that time that three practical operators of proved ability as traction executives had been chosen to manage the electric railway system at Louisville.

It was in 1910 that Mr. Riddle, who continues as vice-president in charge of transportation, became associated with the Louisville Railway as superintendent of transportation. In preparation for this post he had many and broad experiences, first becoming identified with a prominent consulting mechanical engineer and then carrying his theoretical training into practical channels in the services of the United Gas Improvement Company. In 1903 he was in charge of the erection of buildings and installation of equipment for the Connecticut Railway & Light Company. Later he was connected with the Rhode Island Company, the Chicago, South Bend & Northern Indiana Railway and then with the Philadelphia Rapid Transit Company. It was from Philadelphia that he went to the Louisville Railway.

R. H. Wyatt, new acting manager of the Louisville & Interurban Railway, was promoted to the newly created position of general superintendent of the interurban system in 1921. Prior to that and since 1910 he had been general freight and passenger agent. Mr. Wyatt is one of the veterans of the local system. He has served more than 40 years with the Louisville company. The Louisville Railway embraces 188 miles of city track and 102 miles of interurban line.

Charles H. Allen Goes to Chicago as Comptroller

Charles H. Allen appointed comptroller Chicago Surface Lines, as referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 27, 1924, has been connected with the auditing department of Stone & Webster, Inc., since 1906. At first he occupied his time with mere routine duties in connection with concerns that Stone & Webster manage or control, but in later years he handled vast amounts of confidential work of appraisals, valuation for rate-making purposes, bank reports, consolidations and reorganizations. This character of work has kept him in contact with great projects of transportation, public utilities and industrials all over the country, and it may not be far afield to say that the value of properties which he has studied and investigated as the financial representative of Stone & Webster in the last few years aggregate $2,000,000,000.

Charles H. Allen

During the World War Mr. Allen was stationed at Hog Island for eighteen months. There he served on the staff of A. R. Patterson, who was vice-president and treasurer, and in 1921 he was associated with Mr. Patterson again in a financial study of the affairs of the Commonwealth of Massachusetts under the direction of a commission appointed by Governor Cox. E. S. Webster served as chairman of that commission. This work for the state led to the creation of the present Commission on Administration and Finance.

Prior to his connection with Stone & Webster, Inc., Mr. Allen was traveling auditor for companies which operated railways, gas and electric light and power companies in southern New England. Some of these concerns were later absorbed by the New York, New Haven & Hartford Railroad. He began his career as an auditor in Connecticut.

Journal Staff Changes

Henry W. Blake, who has been with ELECTRIC RAILWAY JOURNAL since 1891, will more completely retire from active responsibility in the production of the paper effective Jan. 1. This is following out the wish he has held for several years back. Morris Buck is promoted from associate editor to managing editor and J. A. Miller, Jr., from assistant editor to associate editor.

Mr. Blake has wanted to be relieved of the active administration of the editorial work, so that he might devote more time to his personal activities and to phases of editorial work in which he has particular interest. During the past few years he has continued as co-editor of the paper, leaving the executive responsibility largely to his associate. Now he will carry out his desire further by retiring as editor. But the JOURNAL is, indeed, fortunate in that it will continue to have the benefit of Mr. Blake's long experience in the industry as he will give some of his time to the active staff work.

As an editor Mr. Blake has for many years been pre-eminent in the field of technical journalism. He has been with the paper almost from its beginning, and with James H. McGraw has been in large measure responsible for the position it holds in the industry. In fact, as one of his long-time associates put it: "Mr. Blake has written his very life into the columns of the ELECTRIC RAILWAY JOURNAL, which stands as a monument to his 30 years' endeavor." In his career as editor he has stood out for the charm of his personality, for his extensive knowledge of the field and for his willingness to impart to others his information on the subjects connected with the transportation industry.

A graduate of Yale in 1886 as a civil engineer, Mr. Blake took a course in electrical engineering at Massachusetts Institute of Technology, after which he became connected with the Sprague Electric Railway & Motor Company, which was then engaged in constructing electric railways in various cities in the United States. From the time he joined the staff of the JOURNAL in 1891 until the present his career and the record of the JOURNAL are almost synonymous.

Morris Buck, for the last two years associate editor of the JOURNAL, becomes managing editor. Prior to joining the staff Mr. Buck was associated with John A. Beeler of New York for seven years in consulting engineering work. In this connection he had charge of important investigations of electric railways throughout the country, including surface, rapid transit and interurban lines. Among the properties which he studied are those of Boston, the Eastern Massachusetts, New York, Philadelphia, Washington, Newark, Richmond, Chicago, Kansas City, New Orleans and others. This work included a wide range of operating, engineering and financial problems, and was done for railways and public officials.

The earlier experience of Mr. Buck included work as engineer for the Westinghouse Electric & Manufacturing

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Company and the Mechanical Appliance Company, cost analyst for the Mellon National Bank of Pittsburgh and special apprentice with the Delaware, Lackawanna & Western Railroad. For six years before taking up consulting work Mr. Buck was assistant professor of railway electrical engineering at the University of Illinois. At this time he became well known in the electric railway field for original work done in the solution of electric railway engineering problems by graphical methods and for his text-book, "The Electric Railway." Other teaching experience of Mr. Buck included a year as professor of electrical engineering at Clarkson College of Technology, two years as assistant professor of electrical engineering at New Hampshire State College and one year as instructor at Cornell. He is a graduate of the last university in mechanical engineering, class of 1904, and of the University of Illinois in electrical engineering, class of 1917.

John A. Miller, Jr., who has been assistant editor for two years, becomes associate editor. Prior to joining the paper he was an engineer in the traffic department of the Public Service Railway, Newark, N. J. He entered the service of the railway by taking a course as "cadet engineer," and was one of a comparatively small number of men to complete the full course. He was employed in the maintenance-of-way department, the power houses, the distribution department, the car shops, the time-table department and the traffic department. After he completed this work Mr. Miller served as assistant supervisor at the Montclair carhouse, was in charge of the trainmen's instruction school at Hoboken and was a special instructor on safety cars at Paterson.

Mr. Miller received his early education at the Newark Academy, following which he took the civil engineering course at Yale, graduating in 1915. He served with the First New Jersey Cavalry on the Mexican border in 1916 and was in France during the World War as second and first lieutenant of the 104th Engineers.

Personnel Changes in Benton Harbor

Changes in the management of the Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich., are as follows: George N. Tidd is vice-president, along with Thomas F. English, who has been general manager. Frank B. Ball is secretary and treasurer and R. J. Brown has succeeded J. C. Rohl as superintendent of overhead construction.

G. E. Matt is comptroller of the Oklahoma Union Railway, Tulsa, Okla. E. C. Van Valkenburg is assistant to the general manager. J. A. Ladd is roadmaster and E. D. Nelson is master mechanic. E. F. Blanchard is superintendent of claims, replacing F. E. Kirkpatrick.

W. L. Weston, recently manager of the Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S., has accepted a similar position at Woonsocket, R. I.

T. Fitzgerald Elected Vice-President at Pittsburgh

Thomas Fitzgerald, general manager of the Pittsburgh Railways, Pittsburgh, Pa., has in addition been elected vice-president of the company. Mr. Fitzgerald has been manager of the company since last February. His traction activities date back to 1899, but were interrupted by the war. Following his discharge from the army as lieutenant-colonel in 1919, he opened offices in Pittsburgh as consulting electric railway engineer. During the past few years he has made a comprehensive study of the Pittsburgh Railways system and assisted in the plans for the reorganization. He is a great believer in the efficacy of merchandising transportation, and it was in accordance with ideas advanced by him that the commercial department of the company was organized, as described in the issue of the ELECTRIC RAILWAY JOURNAL for April 19, 1924, page 620.

Mr. Fitzgerald was born and educated in Baltimore, graduating from Johns Hopkins University with the degree of Bachelor of Arts in 1898, after which he took one year of post-graduate work. The following year he served as inspector of the Third Avenue Railroad, New York, and then accepted the position of superintendent of the Fairmont & Clarksburg Electric Railroad in charge of railway and electric lighting activities, a position he held until 1902. During the next year he was made general superintendent of the Portsmouth district of the Norfolk, Portsmouth & Newport News Company, in charge of railways and electric lighting in Portsmouth, and Norfolk county ferries, operating between Norfolk, Portsmouth and Berkley, Va. He also was engaged in special work reporting on physical and operating conditions of the Roanoke Railway.

From 1903 to 1905 Mr. Fitzgerald served as general manager of the Lexington Railway, Lexington, Ky. In 1908 he transferred his activities to Cincinnati, becoming purchasing agent and assistant to vice-president of the Ohio Traction Company, Cincinnati Traction Company, Cincinnati Car Company, Cincinnati Northern Traction Company and the Indiana, Columbus & Eastern Traction Company. He was promoted in 1907 to assistant general manager of the Ohio Traction Company and Cincinnati Traction Company, which post he retained until 1913, when he was made general manager of these two companies. While serving as general manager he was called upon to make a number of reports on the operating and physical condition of the Columbus, Buckeye Lake & Newark Electric Railway, the Columbus, Newark & Zanesville Electric Railway, the Indianapolis & Northwestern Traction Company and the Columbus & Lake Michigan Railroad.

H. P. Garland has succeeded Charles H. Prescott as president of the Biddeford & Saco Railroad, Biddeford, Me. J. B. Stride, besides performing the duties of treasurer and secretary, is now claim agent. E. O. Hill, formerly superintendent and purchasing agent, now is title of general superintendent.

F. D. Hunt, traffic manager of the Portland Electric Power Company, Portland, Ore., since 1908, is also performing the duties of general manager of the Willamette Valley Southern Railway, Oregon City, Ore. Mr. Hunt has been in the railway business since 1894.

Henry W. Darling has resigned as treasurer of the General Electric Company, Schenectady. In accepting the resignation the directors elected him a vice-president with such duties as shall be assigned to him by the president. Mr. Darling has been intimately associated with the financial affairs of the General Electric Company from the time the company was organized in 1892 by the consolidation of the Edison General Electric and the Thomson-Houston companies. He became identified with the Edison interests in the winter of 1890-91, with headquarters in New York.

R. S. Murray has been elected treasurer of the General Electric Company, Schenectady, N. Y., to succeed Henry W. Darling. Mr. Murray entered the employ of the General Electric Company in 1893, a year after its organization. He was first attached to the Boston office. In 1899 he went to Australia and from there to South Africa in connection with the formation of the Australian General Electric Company and the South African General Electric Company. In October, 1907, he went to Schenectady and three years later became assistant treasurer.

J. Norman has been appointed auditor of the Montreal & Southern Counties Railway, effective Dec. 1. His headquarters are at St. Lambert, Que.

Lawrence Killam of the Royal Securities has become manager of the Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S. Mr. Killam was formerly manager of the Inverness Mines, N. S.

William A. Gill will retire in January as vice-president and a director of the Columbus Railway, Power & Light Company, Columbus, Ohio. Mr. Gill has been a member of the board for the last eleven years. While he has recently disposed of his common stock holdings in the company, Mr. Gill retains a large interest in the preferred stock. He is in his eighty-third year.

Obituary

Frank O'Keefe, who was division superintendent of the Fresh Pond Division of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., when he retired from active service on June 25, 1919, is dead. Mr. O'Keefe spent about 37 years in active service on the surface lines of Brooklyn, starting about 1882 as a tow-boy on the Smith Street line. He was 57 years old.

Cyrus C. Marsh, until recently general manager of the Blue Ridge Traction Company, Allentown, Pa., a position he held for 15 years, died on Dec. 9, following an illness of two years. Besides his connection with the traction company, Mr. Marsh was a director and one of the organizers of the Citizens' National Bank, Slatington, Pa. He was 63 years old.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

New Headquarters Building at Davenport

Erection of a five-story fireproof office building to house the increased headquarters personnel of the United Light & Power Company has been announced by B. J. Denman, vice-president of that company. The building will cost about $500,000. It will be located at Second and Perry Streets, a site which is centrally located and readily accessible from any part of the city.

This structure will be the first wing of a building that eventually will be eight stories high, cover a city block in frontage and cost $2,000,000. The building now to be begun will have a frontage of 132 ft. and a depth of 98 ft. In addition to housing the executive offices of the United Light it will also be occupied by the personnel of the Peoples Light Company and of the Tri-City Railway.

There will be two entrances, one to the office building and the other to the retail salesroom of the Peoples Light Company, which will occupy a considerable portion of the first floor. The office of the railway cashier will also be at the rear of the ground floor. On the second floor, grouped about a balcony, will be the private offices of the executives of the Peoples Light Company and the operating officials of the Tri-City Railway.

On the third floor will be located the private offices of Vice-President Denman, General Manager H. E. Weeks of the securities department and his assistants.

The offices and working rooms of the engineering department and the private offices of G. T. Shoemaker, electrical engineer, also the statistical offices, will be located on the fourth floor. The fifth floor space has not yet been assigned.

Big Sales for Fageol Motors

The Fageol Motors Company reports total sales for the first eleven months of 1924 in excess of $4,044,000. Two new factory units have been added, one a new brick building in Oakland, which more than doubles the company's coach assembly space, and a chassis plant at Kent, Ohio, where Fageol Safety Coach chassis are being made for delivery to the Fageol Motors Company of Ohio, a separate corporation, which builds the bodies and markets the complete coaches in the territory east of the Rocky Mountains.

Rolling Stock

Arkansas Central Power Company, Little Rock, Ark., has received eight new one-man safety type cars, bids for which were referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 7, 1924. The cars were built by the American Car Company, St. Louis, Mo., and cost, on delivery, $15,000 each. The seating capacity of each is 44. The body construction is of steel and the cars are equipped with safety devices.

Track and Line

New York, N. Y.—The Board of Transportation approved the form of contract and directed the advertisement for bids for the construction of two sections of the Washington Heights subway line. One section is under Eighth Avenue from 112th Street to 122d Street and St. Nicholas Avenue. Bids for the construction of this section will be received on Jan. 26, 1925. The other section runs along St. Nicholas Avenue from 122d Street to 133d Street. Bids for the construction of this section of the line will be received on Jan. 29, 1925.

Boston, Mass.—The Metropolitan Planning Division has submitted a report to the Massachusetts Legislature recommending that the Boston Elevated Railway extend its rapid transit service from Governors Square before it spends much money in developing the service from Everett and to Malden. It also says that the Lechmere Square extension through Somerville and Arlington and Lexington should be made before the Malden line improvement is carried out because of the larger population that will be served. On the matter of taking over the Saugus branch of the Boston & Maine Railroad the planning board takes the position that it should not be attempted without further studies. It is suggested that it would be too expensive for the Elevated to take the whole branch, and to take only a part of it does not meet with approval from the Boston & Maine. The division wants another year to study this problem. It opposes the proposition to build an underground station in Everett, and says that the present surface station is giving reasonably good service.

Trade Notes

Diamond Power Specialty Corporation, Detroit, Mich., has appointed the Midwest Machinery Company, 104-106 South Main Street, St. Louis, Mo., as its representative for the territory of Missouri, adjacent to St. Louis, south of and including Springfield and Decatur, Ill. The Midwest Machinery Company includes among the members of its staff of officials Messrs. Stone and Proetz, men widely known in the power plant equipment field.

C. B. Starr has joined the Robert June Engineering Management Organization, 8835 Linwood Avenue, Detroit, Mich. He was assistant mechanical engineer with the Duff Manufacturing Company of Pittsburgh and later served in the capacity of sales engineer with the Detroit office of the Wayne Tank & Pump Company.

Laclede Steel Company, St. Louis, Mo., has sold its forging plant at East St. Louis, Ill., to a new company to be known as the St. Louis Forgings Company, a subsidiary of the Standard Forgings Company, Chicago, with the same general officers as the Standard Forgings Company. The production of car and locomotive axles and forgings and the operation of the plant generally under the new ownership will be continued as heretofore. The St. Louis Forgings Company opened an office on Jan. 2, 1925, at 521 Security Building, St. Louis, Mo., through which information respecting sales and deliveries may be obtained, and thus the company will keep in close contact with customers in the St. Louis district and the Southwest. The general offices of the company will be in the Railway Exchange Building, Chicago.

Economy Electric Devices Company, Chicago, Ill., has received an order from the Nashville Railway & Light Company, Nashville, Tenn., for additional Economy meters with which to equip completely all active motor cars. The present order comes as a result of the successful use of meters on several lines during the past two years and covers approximately 140 meters for delivery and installation during 1925. An order was also received from the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., for 56 additional inspection dial Economy meters with which to equip all remaining active cars.

New Advertising Literature

Monitor Controller Company, Baltimore, Md., has issued Bulletin 67, describing the Monitor edgewound resistor. The bulletin states that this new resistor is especially well adapted to use on electric cars and electric locomotives. Its advantages as compared with the cast-iron grid are discussed in the bulletin.

Metal, Coal and Material Prices

Metals—New York	Dec. 31, 1924
Copper, electrolytic, cents per lb	14.90
Copper wire base, cents per lb	17.25
Lead, cents per lb	9.70
Zinc, cents per lb	8.12
Tin, Straits, cents per lb	58.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.075
Somerset mine run, Boston, net tons	2.15
Pittsburgh mine run, Pittsburgh, net tons	1.875
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.925
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.75
Weatherproof wire base, N.Y., cents per lb.	18.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.157
Turpentine (bbl. lots), N. Y., per gal	0.85

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New York, Saturday, January 10, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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HARRY L. BROWN, *Editor*

Volume 65
Number 2

Municipal Subways Not Favored at Transit Hearings

NEW YORK'S transit inquiry ended with the testimony of Mr. McAneny of the Transit Commission last Thursday. Judge McAvoy, who has been conducting the case as the representative of the Governor, retires with several trunk loads of testimony and exhibits to try to fix the responsibility for seven years of delay in providing more rapid transit facilities. While there is no real reason for prejudging the case, several things do stand out in bold relief. Hylan proved himself to be even more impossible on the stand than he does as Mayor. On the other hand, Comptroller Craig showed the real grasp that he has of the questions affecting the finances of the city. Public necessity apparently compels him to sit with the Mayor on the handling of city matters, but he doesn't relish the association. That is quite plain. If there was a star witness at the hearing it was he. Even Counsel Sherman couldn't hold him in check. He quite ran away with Mr. Sherman on several occasions. Mayor Hylan caused a laugh because he knew so little; Mr. Craig caused a laugh because he knew so much.

The inquiry did not bring out anything startlingly new in the way of evidence. It did, however, accomplish a great public service in that it made more clear to the public some of the principal reasons for the traffic crowding in the New York subways. It also showed the futility as a remedial measure of Mayor Hylan's proposed independent subway system to be municipally owned and operated.

The present-day high cost of building subways was strongly emphasized in much of the testimony presented. The figures given in this connection confirm those printed in this paper at the time the routes of the proposed municipal subway were announced about a month ago, namely, that subway construction costs have more than doubled during the last 15 years. An estimate was given at the hearing by Commissioner Harkness that even with traffic as dense as that on the present subway lines, a fare of 8.45 cents would be required to make the undertaking self-supporting with this higher investment cost and greater fixed charges necessary. Commissioner O'Ryan, the following day, expressed the belief that the fare would have to be 10 cents. These statements must have been sad news to the Mayor, because the State law empowering the city to operate rapid transit lines definitely directs that after the first three years of operation the fare must be such as to pay interest and sinking fund charges on the investment, besides the cost of operation and other expenses.

Finally, Comptroller Craig, in other testimony this week, said the city had nowhere near enough margin over its constitutional borrowing limit to build a subway and that the suggestion that the construction might be paid for in part by local assessment bonds was impracticable, even if such bonds could be issued constitutionally. In his opinion this could not be done. Other testimony clearly places the blame for the overcrowded conditions on the present municipal officials for their refusal to approve necessary extensions or appropriate money to build adequate shop facilities to keep the equipment in good condition.

Altogether the result of the hearing so far has been still further to discredit the municipal subway plan as a relief for present conditions.

Retaining Essential Transit Facilities

THE abandonment of various unprofitable electric railway lines in the past few years does not mean that there is no demand for them. In nearly every case citizens have voiced their opposition to cessation of service, and the step has been taken in spite of their protests. The reason for abandonment has been that an insufficient number of such persons have patronized the railways to let them earn their expenses.

Coupled with the small amount of traffic there have been various restrictions imposed by the municipalities through which the lines ran, as well as taxes of every sort and description that could be levied on the properties.

A law enacted in Massachusetts some years ago, but not invoked until last March, permits the communities themselves to acquire and operate such unprofitable lines through public trusteeships. In the article in this issue on publicly-owned transportation areas, it will be seen that some bankrupted electric railways have not been allowed to fall wholly into the hands of the junk man. Towns like Greenfield with 15,500 inhabitants, Montague City with 7,600 and Athol with 10,000 have lately taken advantage of the transportation area statute of 1920 by purchasing as much of the bankrupted local railways as was suited to their needs.

Inasmuch as these properties were acquired on "actual value at the time of appraisal and not on the cost of replacement," the investment in each instance is so small that the expense of running the properties could be made less than the cost of an equivalent motor-bus service. Operation also was simplified through the purchase of power. Taxes are sure to be less.

In spite of these advantages, it is not to be taken for granted that operation will be profitable. The traffic in Greenfield, for instance, is only one-third of what it was in 1917. The causes for the decrease include higher fares in a community where most people can walk, the great increase in private automobiles and a more exact-

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ing demand for shorter headways and higher speed service than that which the railway had been providing.

Since the trustees have started with the same fares and service as the predecessor company, it is obvious that they are not banking on a return to old riding habits. The action of the citizens in voting to buy and continue the operation of the most essential portions of the electric railways in their territory can have only one meaning—that although the private automobile may decrease riding to an extent which makes operation for profit impossible, there is still sufficient need for a public utility system to provide a dependable means of transport throughout the day and most of the night for those who have no personal vehicles available. These long-headed New Englanders realized that their towns would suffer in business, pleasure and general civic activities if the woman who wanted to shop, the boy who wanted to go to the films and the elderly woman who wanted to go to the sewing circle were deterred from doing so because someone else in the family was out with the "car." Their example in establishing these transportation areas may well be cited by the harassed operator as proof that, in spite of millions of privately owned Fords, public transport systems are still a necessity.

Operating Men Realize Their Obligations More Clearly than Do the Bankers

ALTHOUGH the phrase "moral obligation to render service" is still distasteful to some of the older generation of railway men, the importance of fulfilling this obligation is clearly recognized by a large majority of the managements. The financial interests connected with the railways, however, do not always see the value of this policy and are sometimes inclined to condemn those phases of railway operation which do not show a direct profit.

However reasonable this attitude may have been years ago, recent developments have made the theory untenable. The advent of the bus made possible the establishment of a certain measure of transportation service without any large initial investment. Every one knows how this opportunity was availed of in many places to skim off the cream of the traffic and make a quick profit. To meet this situation, it has been, and still is, the contention of the existing transportation companies that needless duplication of service should not be allowed. More and more this proposition is being accepted by the general public.

But the acceptance of this proposition by the public carries with it an obligation upon the railway. If the railway claims the right to be protected where it is already furnishing adequate service, it must also undertake to furnish whatever service is required. In other words, when the public is willing to forego the temporary advantage of duplicate service, the railway ought in return to provide facilities wherever needed, even if necessary to forego immediate profits on such extension of service. If the traffic is light in such cases this may perhaps entail a loss that looks bad on the balance sheet. The experienced operating man, however, who is usually in closer touch with public feeling than are directors of the company, knows that the railway can well afford to stand this small loss if giving service in one place keeps out competition in another.

Prompt Publication of Statistics Supplies a Distinct Need

IT IS but natural that events which occur regularly become commonplace after a while and are accepted as a matter of course. In a sense this may have been the feeling with which many of the readers of this paper received the Annual Statistical Number of ELECTRIC RAILWAY JOURNAL, published last week. Such a number, issued on the first Saturday of each January, has been a feature of this publication since 1908. Each year the principal statistics indicating the advance of the industry during the previous 12 months have been compiled through correspondence and in other ways and are made available through the JOURNAL for immediate use of its readers.

Obviously, much of this information has to be collected before the close of the year, and a great deal of it is based on data collected and filed from January to December of the year just closed. During the last few weeks of December, all of this information is collated, digested and supplemented by last-minute telegraphic advices to complete the tables and statistical information, and to form a basis for the articles and editorials in the statistical issue. From time to time some new feature of an appropriate nature has been added to the series of statistical issues, so that now much more complete data relative to the electric railway industry are printed, and on a wider range of subjects, than it was attempted to cover in the early numbers of this kind.

The execution of such an undertaking would be impossible without prompt and cordial responses of the various electric railway companies to requests for information from the editorial staff. The editors take this occasion to express their sincere thanks for this cooperation and for its practically unanimous nature. A large number of questionnaires were sent out to large and small companies alike, and in some cases to companies which had ceased operation. Despite this, replies were received promptly to each list of questions from many more than 90 per cent of the properties addressed. It is doubtful if any other industry has ever shown such a large proportion of replies in so short a time to such extended lists of questions. Yet this experience is repeated year after year with the statistical issue of this paper.

The extent to which the statistics published in the JOURNAL annually in this way are quoted in and out of the industry justifies the publishers of this paper in believing they are performing a needed service. So many requests for copies of the Statistical Number were received last year that the issue was soon exhausted, even though the precaution had been taken to print an extra large edition. Certainly if this work was left to be performed by the government, the figures would not be available three days after the close of the year. The reports of the Census Bureau are models of accuracy and completeness, but they are not noted for the promptness of their publication. The census of the electric railway industry, taken by the Census Bureau in 1922, has still to be made available to the public in complete form. While the elaborate figures issued by the government have their place, it is to supply the obvious need for a more rapid survey that the Statistical Number of ELECTRIC RAILWAY JOURNAL has been published year after year.

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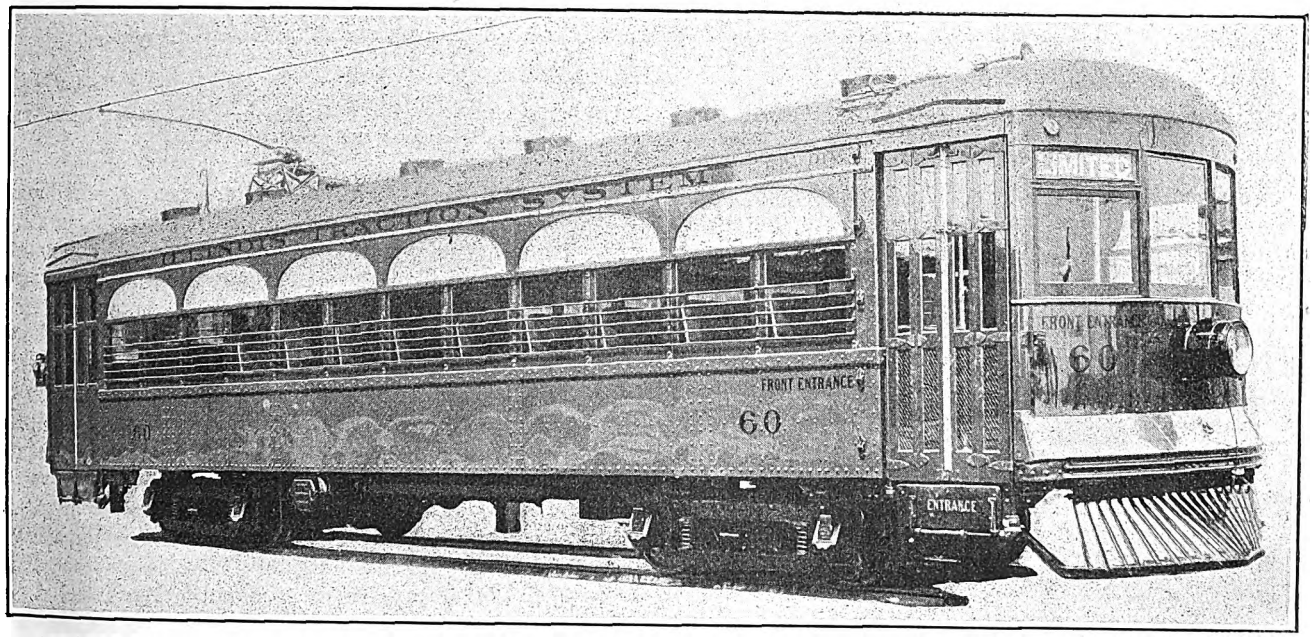
I.T.S. Buys Observation Interurban Cars

Light-Weight, One-Man Interurban Cars for Illinois Traction System Have the Main Passenger Compartment at the Front End with Smoker and Baggage Space at the Rear—They Are Arranged for Single-End Operation, with a Back-Up Device for Switching and Reversing at Terminals



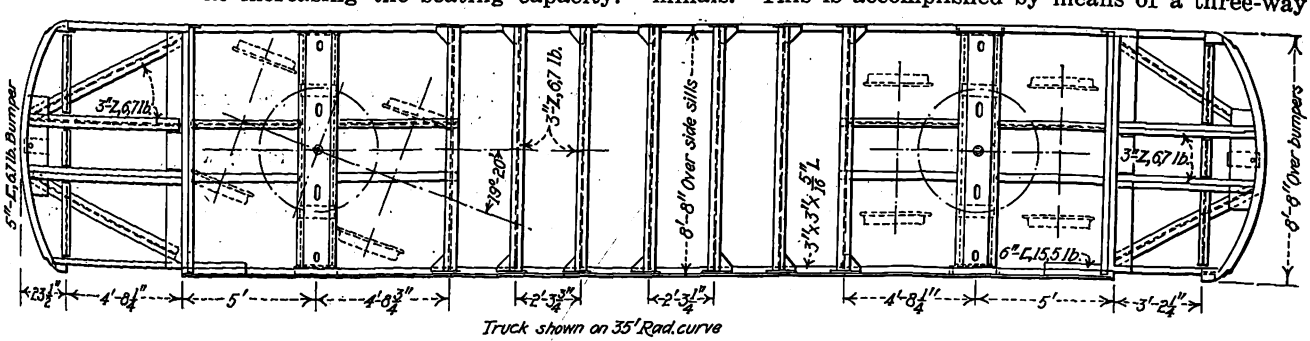
Double-Arched Windows Give the Exterior an Attractive Appearance. The Rear Folding Doors Are Used for Loading Baggage, but a Step Is Provided so that Passengers at Busy Terminals May Board or Alight at Both Ends

SEVENTEEN light-weight, one-man, double-truck interurban cars recently were placed in service on the Illinois Valley division of the Illinois Traction System. They embody a number of novel features of design for this class of equipment, which have attracted increasing attention from interurban operators interested in improving the quality and frequency of service while at the same time holding operating costs to a minimum. These cars were developed with the idea of providing a type of equipment which would attract increased patronage by affording greater convenience and comfort to passengers and also present that appeal to the prospective rider which is made by an attractive and inviting general appearance.

Observation Compartment at Front End

These cars were built by the St. Louis Car Company, and are designed primarily for single-end operation, thus making a substantial saving in weight and cost, and at the same time increasing the seating capacity. Further advantage is taken of this method of operation to arrange the main passenger compartment as an observation section, giving an unobstructed view of the track and landscape ahead. Careful consideration of the factors which affect the pleasure of a ride in any vehicle led to this step, and it is held to be an important feature in the merchandising value of the design. It has been pointed out that the pleasure of an automobile ride would be almost entirely lost for the passengers in the rear seat if a curtain were mounted back of the driver so that they could not see out the front end of the vehicle. Putting the main passenger compartment at the front end of an interurban car was therefore held to make the ride much more pleasant, and from that standpoint the arrangement was considered to have a material merchandising advantage.

Although the cars are designed for single-end operation, a back-up device allows the cars to be controlled from the rear end for switching purposes at Y terminals. This is accomplished by means of a three-way



The Vestibule Floors Are Carried Across Flush with the Body Floor, Giving a Strong Underframe. A 3-In. Z-Section Is Used for Cross Sills

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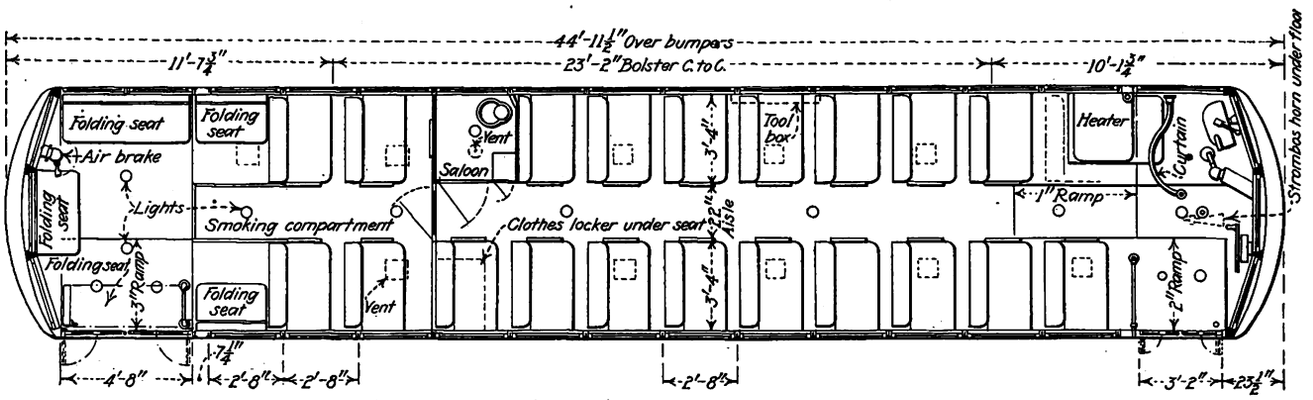


The Main Passenger Compartment of This Illinois Traction Car Is at the Front End to Give Passengers a Clear View Ahead. The Car Seats 52 in Winter and 54 in Summer. A Slight Ramp Decreases the Step Heights

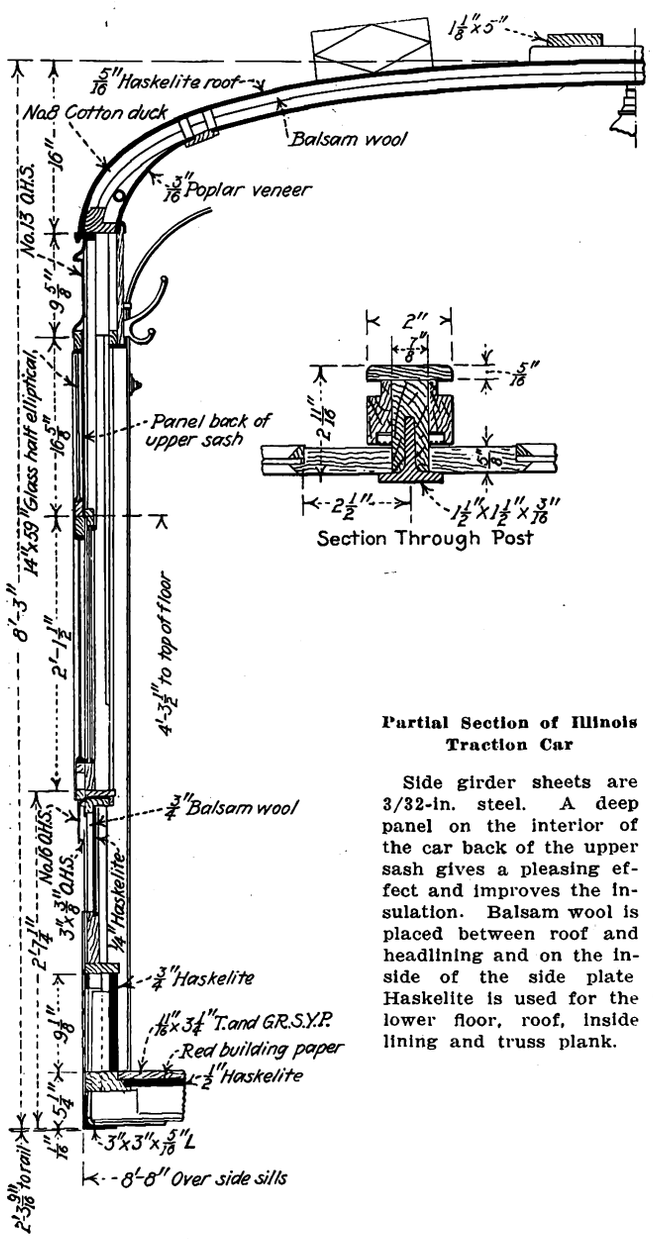
switch at each end of the car. The arrangement allows the controller to be put on the first point in the reverse position with the switches off, while the operator changes to the rear end. He then runs the car in the reverse direction by turning the switch at that end on and off as required, which is equivalent to operating on the first notch of the controller, since the controller is left on the first point in the reverse direction while the operator changes ends. A special controller handle is also carried on each car, with which the dead-man release feature on the controller is made inoperative for this rear-end switching. A brake valve is installed at the rear end for the reverse movement, and the same valve is used for operating the door at that end for loading baggage, etc.

Full safety car devices are included in the equipment. The front doors are opened and closed from the brake valve in the same way as on other one-man equipment. The rear doors, opening into the baggage compartment, can, as explained above, be opened from the brake valve at the rear end of the car, or they can also be operated from an outside valve conveniently located for a baggage man or station agent. These rear doors, like those at the front, are of the folding type, and steps are provided at this location so that passengers can be loaded at both ends of the car at terminals, amusement parks or other points where heavy passenger interchange takes place.

The cars are 44 ft. 11½ in. long over the bumpers, and are 8 ft. 8 in. wide over the side sills. The height over the roof was made 10 ft. 6⅛ in. and was purposely kept as low as possible to give the cars a long, rakish appearance. The height from rail to top of the body floor is 2 ft. 8⅛ in. when the car is mounted on 26-in. diameter wheels. This floor is carried continuously across the vestibules, with a 1-in. ramp from the bolster to the end sill at the front end and a 2-in. ramp from the center line to the edge of the step, so as to give step heights of 15½ in. and 14⅛ in. respectively.

Sixteen cross seats in the main passenger compartment provide for 32 passengers. The smoking compartment at the rear is separated from the main compartment by a bulkhead with swinging door. It has four cross seats and two folding longitudinal seats, giving additional capacity for 12 passengers. Folding seats in the rear baggage section will seat eight additional, making a total seating capacity of 52. When the stove is removed in summer, space is available for an additional cross-seat in the main compartment, increasing the seating capacity to 54.

Cross seats are 38 in. wide from the inside lining over the aisle plates, leaving a 22-in. aisle. Particular attention was paid to providing a type of seat that would give the maximum in comfort. These were made by the St. Louis Car Company and are non-reversible. Those in the main compartment are upholstered in plush with a high back and head roll. Seats in the smoking compartment are upholstered in genuine leather. The cushion springs are of the double-deck type, the bottom layer of springs being stiffer than the top layer, so as to take care of a light passenger and a heavy one side



Partial Section of Illinois Traction Car

Side girder sheets are 3/32-in. steel. A deep panel on the interior of the car back of the upper sash gives a pleasing effect and improves the insulation. Balsam wool is placed between roof and headlining and on the inside of the side plate Haskelite is used for the lower floor, roof, inside lining and truss plank.

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by side with comfort. The arrangement of springs prevents a heavy passenger from dislodging a lighter passenger seated on the same cushion. These cushions are 7 in. thick. The seats are quite low, the over-all height from the floor to the top of the cushion being only 17 in.

The steel framing construction is more or less standard, but the design was worked out with a view of obtaining minimum weight consistent with proper strength and safety. The side girder sheets are straight and are made of $\frac{5}{32}$-in. steel. The lower floor is $\frac{1}{2}$-in. Haskelite, covered with $\frac{13}{16}$-in. tongued and grooved yellow pine. This floor construction is expected to add materially to the stiffness of the body. In the aisles, the wood flooring is covered with $\frac{3}{16}$-in. brown battleship linoleum.

Formed Haskelite in large panels is used for the roof. The hoods are made of two-ply poplar slats, and the headlining is three-ply poplar veneer. Between the side girder sheet and the inside lining, and also between the roof and headlining, Balsam wool is used for insulation. Between the side sheets and inside lining there is one layer of 1-in. insulation, while two layers of 1-in. material are used between the roof and headlining.

The interior is finished in mahogany, including doors and sash. Both inside lining and truss plank are made of Haskelite, the former being $\frac{1}{4}$ in. thick and the latter $\frac{3}{4}$ in. Continuous Gothic sash between the letterboard and the lower sash are permanently fastened in place, and a removable panel is fastened back of the sash on the interior of the car so as to give a deep paneled effect on the interior, while providing better heat insulation. Storm sash for the lower windows are provided for winter use. At the front end the vestibule is glazed with $\frac{3}{16}$-in. non-shatterable glass.

SOME OF THE PRINCIPAL ITEMS OF EQUIPMENT

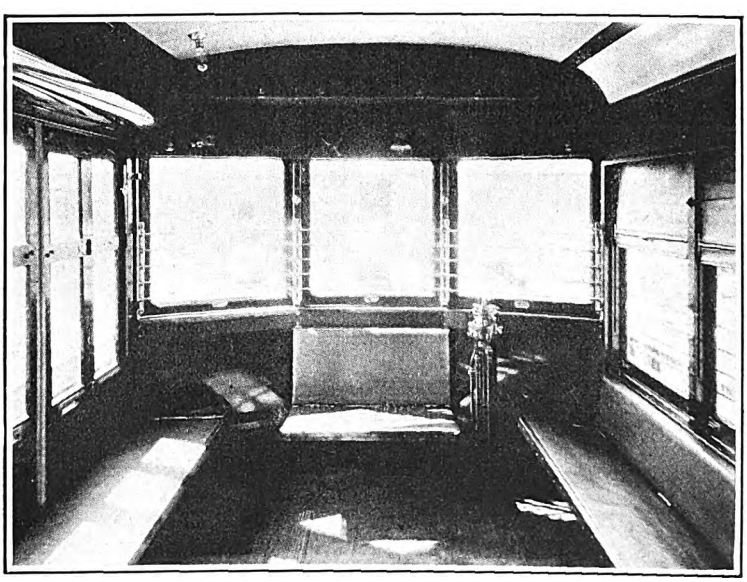
Warning signal	Strombos horn
Water cooler	Dayton No. 320
Ventilators	St. Louis Car Company, Peerless
Trolley retrievers	Ohio Brass
Destination signs	Hunter No. 8
Step safety treads	Feralun
Sash fixtures	O. M. Edwards
Headlight	Crouse-Hinds
Heaters	Peter Smith hot air No. OP-1
Back-up equipment	General Electric
Meters	Economy, with inspection dials
Door engines	Universal
Curtain fixtures	Curtain Supply Company No. 88 pinch handle
Curtain material	Double-faced Pantasote
Signal system	Faraday
Hand brakes	Peacock staffless
Roof covering	No. 8 cotton duck
Trolley base	Ohio Brass
Rails and stanchions	Aluminum
Trimmings	Bronze, polished and lacquered
Dry hopper	Dayton

The Cars Are Mounted on St. Louis Cast-Steel Frame, Equalized Trucks of 5-Ft. 9-In. Wheelbase with 26-In. Diameter Davis Cast-Steel Wheels

The complete weight ready for service is 36,840 lb. The cars are mounted on St. Louis Car Company equalized cast-steel frame-type motor trucks of 5-ft. 9-in. wheelbase, with 26-in. Davis cast-steel wheels having $3\frac{3}{4}$-in. threads. Axle diameters are $4\frac{1}{2}$ in., with $3\frac{3}{4}$x7-in. journals. The motive power consists of four GE-265 motors, rated at 35 hp. each. The control is K-35 KK. Air-brake equipment is Westinghouse single-end, with a DH-16 compressor, and full safety car equipment of the Safety Car Devices Company. Some of the other principal items of equipment are given in the accompanying table.

Portable Substation Operates at Different Voltages

A PORTABLE substation, designed to operate at either 13,200 volts or at 6,600 volts, has been built by the Bangor Railway & Electric Company. Some time ago, when changes were being made in the city substation of the railway, trouble was experienced at an outlying substation. A rotary converter was placed on a freight car and taken to the point of trouble to replace the disabled machine. The latter was then



An Observation Section and a Baggage Compartment Are Provided in the I. T. S. One-Man Interurban Car

The observation feature is obtained by placing the main passenger compartment at the front end of the car. Aluminum coat hooks instead of the more usual baggage racks help to give the interior a clean-cut appearance. In the baggage compartment at the rear, upholstered folding seats provide for passengers when required.

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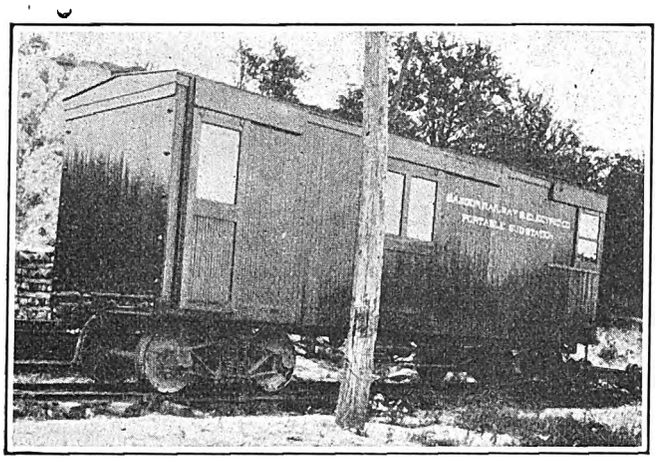


All of the Apparatus of This Portable Substation Has Been Placed Inside of the Car Body

brought back and repaired. It was decided, however, that instead of installing the machine in place of the one which had been moved to the outlying substation, it should be left on the flat car for use as a portable substation in case of emergency.

A body was built on this car at the railway shops and the necessary equipment was installed. Live line grippers are used to connect with the transmission lines. These take the high-tension current to a change-over switch which is interlocked with the oil switch. Ample transformer capacity is provided for either voltage. Direct current for railway operation is supplied by a 500-kw. rotary converter.

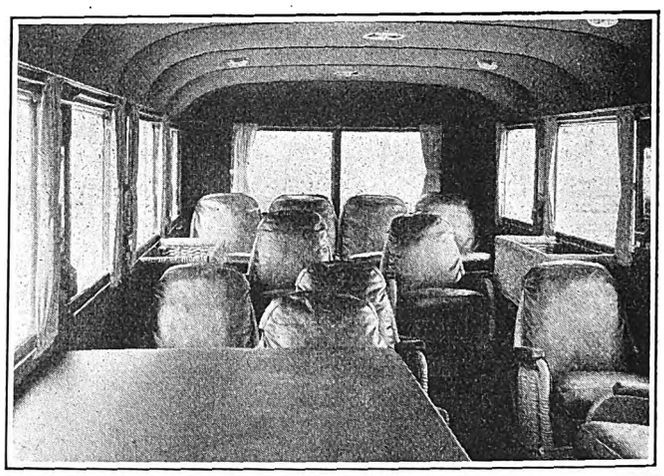
All the apparatus has been placed inside the car. The converter occupies the opposite end of the car from the transformer and switches. It has been mounted on a platform which is adjustable so that the converter will stand level no matter what the slope of the car floor may be. The expenditures made to construct this portable substation were very moderate and it has proved extremely useful, obviating the necessity of buying stand-by equipment for several permanent substations.

Special Bus for Inspection Trips

FOR the use of officials of the company making inspection trips to points not easily reached by rail the Public Service Railway, Newark, N. J., has purchased a specially equipped Fageol bus. A leather topped table which jack-knifes and folds down against the wall has been provided so that the bus can be used as an office while en route. When the table is folded, all chairs, which are independent and movable, can be faced forward. Seating capacity for 18 persons is provided in individual wicker chairs.

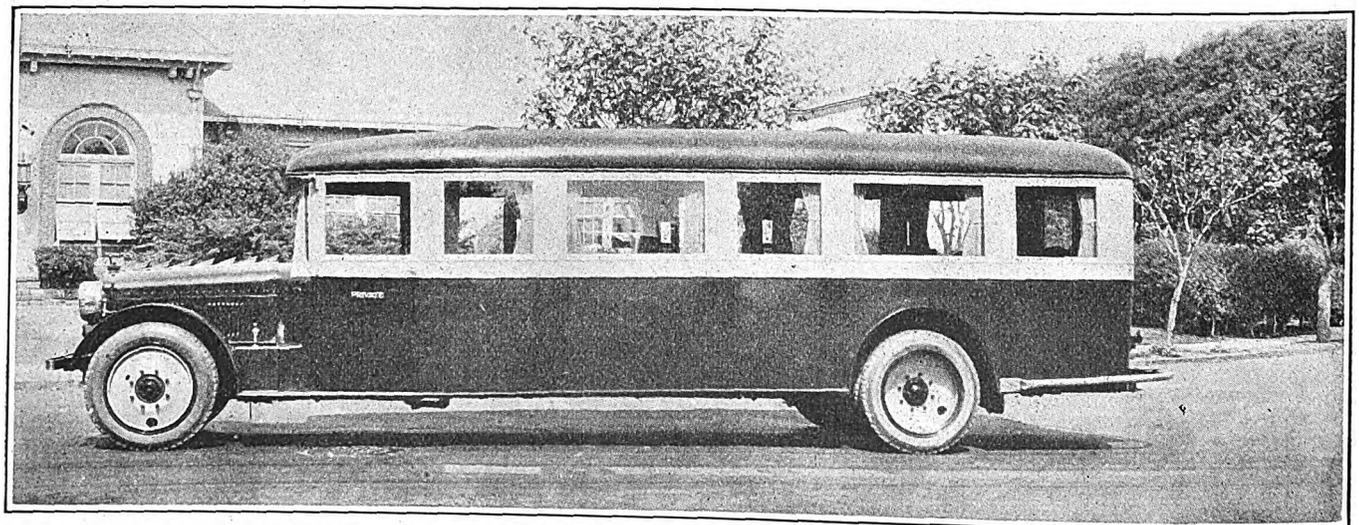
An electric fan has been mounted on the partition in back of the driver's seat and is operated from the car's 12-volt storage battery. Another feature of the equipment is a telephone from the center of the main compartment to the driver. Baggage space is provided in compartments beside the driver and at the rear of the bus.

The interior is attractively finished in gray silk mohair plush. Upholstery is done in green colonial grain leather. The floor is covered with a heavy velvet carpet. Mirrors, ash receivers, nickeled hardware, and hand-rubbed mahogany window trim add to the convenience of the passenger and the appearance of the vehicle.



A Folding Table Makes It Possible to Utilize This Bus as an Office While en Route

Many of the stations of the Public Service Electric & Gas Company are not located on the lines of the Public Service Railway. Moreover, a number of bus routes operate over highways remote from the rail lines. The bus will afford a convenient means for officials to reach points away from the rail lines, but will not supplant the parlor car heretofore used for inspections of the railway property. It is planned to rent this vehicle, when not otherwise in use, to persons desiring to arrange special parties.



Bus Used by Railway Officials in Making Inspection Trips to Points Away from Tracks

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Atlanta Improvements to Cost $9,000,000

Changes Recommended in Beeler Report Include Rerouting of Cars, Elimination of Jitneys and Establishment of Bus Service by the Railway, Widening of Streets and Construction of New Viaducts—Underground Moving Sidewalks Proposed for the Business District—City Is to Bear 75 per Cent of the Total Expense

WHAT amounts virtually to a revised city plan for Atlanta, Ga., with many extensive changes in streets and transit facilities, is recommended by the Beeler Organization, New York, in a series of eight reports recently presented to the special traction committee of the Council. Study of this subject was undertaken early in 1924 as the result of a petition in which the Georgia Railway & Power Company stated that the credit of the railway department was exhausted and that relief was imperative if it was to continue to function and serve the community properly. At that time the company asked for the elimination of jitneys from streets on which the cars operate, a revision of its routes and the abolition of unnecessary stops. Some relief from paving burdens and a higher fare also were desired by the railway.

In general, the Beeler report upholds the position taken by the company and recommends the elimination of jitneys, rerouting and relocation of stops on all car lines. Relief from paving burdens is also recommended, but a ticket rate of four for 25 cents is held to be preferable to that of three for 20 cents as requested by the railway. Thus the price of a single ticket would be 6¼ cents as against 6⅔ cents. The petition and the report are in accord in fixing the cash fare at 10 cents.

Together with these changes it is proposed that new viaducts be constructed, that certain streets be widened and some new streets cut through, and that an underground moving sidewalk be built. Bus service operated by the railway in conjunction with its car service is suggested. According to the report these changes should result in increasing the company's net revenue from $500,000 to $1,200,000. Financial aspects of the report are dealt with in this article. Readjustment of service and routes as well as the new construction necessary to put this plan into effect will be described in later articles.

Atlanta is a young city that has grown beyond the wildest dream of its founders. From 1860 to 1870 it increased 128 per cent; from 1880 to 1890 it increased 77 per cent, and from 1900 to 1910 it maintained practically the same rate of growth. The present tendency is to build up the territory immediately beyond the city faster even than the city itself. Population figures for the city and the 7-mile zone are given in an accompanying table.

In all questions pertaining to transit in Atlanta the race problem must be considered. At present the population of the city is divided between whites and colored in a proportion of approximately two to one. Of the colored residents 90 per cent live within a radius of 2 miles from the business center. They are generally grouped in the valleys. Due partly to topography and in some instances to lack of adequate transportation facilities there are a number of districts comparatively close in where little or no development has occurred.

The city system of the Georgia Railway & Power Company comprises 81.92 miles of double track and 56.116 miles of single track. Of this, about 210 single track miles are used for passenger car operation. The 23 car lines reach practically all of the developed portions of the city and its suburbs within the 7-mile zone. Weekday schedules require 187 cars during the day and 330 during the rush hours.

POPULATION OF ATLANTA AND SUBURBS, 1850-1940

Year	City of Atlanta	7-Mile Zone
1850	2,572	.....
1860	9,554	.....
1870	21,789	.....
1880	37,409	.....
1890	66,533	80,972
1900	89,672	112,798
1910	154,839	172,613
1920	200,616	228,782
1930 (estimated)	263,000	324,333
1940 (estimated)	325,000	425,000

PASSENGER STATISTICS BY YEARS, 1910-1924

Year	Revenue Passengers	Transfer Passengers	Free Passengers	Total Passengers
1910	44,908,137	9,918,969	697,351	55,524,457
1911	50,235,340	11,274,778	736,619	62,246,737
1912	54,345,498	12,119,284	871,345	67,336,127
1913	57,400,821	13,008,050	994,580	71,403,451
1914	56,643,974	12,799,194	873,347	70,316,515
1915	52,649,629	12,449,576	4,402	65,103,607
1916	53,684,771	12,831,650	3,629	66,520,050
1917	59,228,227	14,155,060	3,606	73,386,893
1918	70,575,593	14,830,912	74,699	85,481,204
1919	76,804,565	16,704,145	87,346	93,596,056
1920	77,284,154	17,359,439	None	94,643,593
1921	73,611,786	17,746,693	None	91,358,479
1922	73,255,211	18,917,453	None	92,172,664
1923	75,518,711	19,838,406	None	95,357,117
1924*	73,413,026	19,967,265	None	93,380,291

*Estimated

A complete survey was made by the Beeler Organization of the routes of the railway. This included traffic checks, riding logs and general observations. Passenger counts covering a period of two days were taken at the peak points of all the lines. One-day counts were taken at the short line points and other places concerning which information was desired. In all 45 locations were checked from 6 a.m. until midnight. Loading characteristics of the various lines were analyzed from data gathered on 150 round trips. Each trip record shows all stops, the location and volume of passenger interchange, length of stops, any delay and its cause. Similar observations were made also of the jitneys to determine their effect on the problem. Special studies were made of vehicular movements and pedestrian traffic.

Railway Traffic Is Decreasing

From 1910 to 1920 the number of revenue passengers carried by the railway increased. At the beginning of this period the railway was carrying 45,000,000 passengers a year while at the end of the decade the total reached more than 77,000,000. Since 1920 the tendency has been downward. Preliminary estimates are that only 73,400,000 passengers were carried during 1924. The revenue rides per capita show a similar fluctuation.

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The peak was reached in 1919 with 344. The present trend is downward and indications are that the figure for the year just ended will be about 277. Detailed figures are given in an accompanying table.

During the last 4 years the railway has had to meet increased operating expenses while its revenues have been depleted by unregulated and pernicious jitney competition, the month of September showing a loss of nearly 670,000 revenue passengers as compared with the year before. Net earnings are so low that they fail to attract the necessary new capital to make the desired changes and improvements in equipment and service.

Various causes are given for this falling off in street car riding habit. The great growth in the use of the private automobile, taxicab and jitney are factors. The latter, of which there are now some 275 licensed, are by far the most serious form of competition. They operate directly upon and along the tracks of the best lines where the population is dense and short-haul traffic exists. If the 7,750,000 jitney bus passengers now carried annually were transported by the railway, the revenue rides per capita per mile of track would be 1.46, which is about what it should be under existing business conditions.

Careful computation shows that the number of passenger vehicles in use on Atlanta's streets as of January, 1924, were as follows: Street cars, 330; private automobiles, 27,540; jitney buses, 136, and taxicabs, 147. In round figures the passengers carried per annum were as follows: Street cars, 75,500,000; automobiles, 54,000,000; jitneys, 4,500,000, and taxicabs, 1,300,000. The passengers per trip were as follows: Street cars, 35.3; automobiles, 1.8; jitneys, 3.6, and taxicabs, 1.4. Cost to the passenger of the various kinds of ride, in cents per mile, averages as follows: Street car, 2; automobile, 5.16; jitney, 4.26, and taxicab, 32.18. The apparent high rate charged by the taxicab is because nearly one-half of its mileage is while vacant.

The total cost to the users in the 7-mile zone of the various services is as follows: Street cars, $5,139,000; automobiles, $16,391,000; jitney buses, $417,000, and taxicabs, $742,000, or a total of $22,689,000. Those who employed private automobiles paid three times as much, not including interest, for their 54,000,000 rides as it cost the 75,000,000 railway riders. This demonstrates two important points—first, the great demand for transportation, and, second, a willingness on the part of the public to pay well for the desired service.

A recent check in the business district showed 2,360 automobiles parked on the streets, 814 in open lots, and 1,478 in garages. Out of a total of 4,652 automobiles, slightly more than one-half were parked in the streets. With the acute congestion now existing it is evident that if the present business district is to retain its prestige, relief must be afforded, the capacity of its arteries increased, and its development expanded to meet the new requirements of a comprehensive co-ordinated plan of local transportation. Prompt and drastic action is necessary to afford the railway relief from its present plight and permit it to make extensions and improvements.

Cost of Operation

To ascertain the operations by individual lines, the total operating revenue was distributed proportionately to the passenger revenue, and the cost of operation, including taxes and renewals, was distributed on a basis of passenger car hours operated, taking into consideration the car types.

Figures showed that 11 of the 23 lines failed to earn sufficient to cover even the operating deductions. A number of the others were perilously near a similar condition. The average of all the lines in 1923 showed a net earning of only about 5 cents per car-mile available for interest on the investment. Besides jitney competition the low average earning rate in Atlanta is due to duplication of service, slow speeds, congestion, unbalanced through routes, and long-haul suburban service, at low fare rates.

A comparison of the general operating statistics for the year 1924, partly estimated, as compared with those for 1923, is as follows:

STATISTICS FOR 1923 AND 1924, GEORGIA RAILWAY & POWER COMPANY—RAILWAY DEPARTMENT

	Year Ended Dec. 31, 1923	Year Ended Dec. 31, 1924
Population served (estimated)	257,477	267,042
Total operating revenue	$5,244,205	$5,057,704
Total operating deductions	$4,505,248	$4,491,346
Operating ratio, per cent	85.80	88.60
Revenue per car-hour	$3.49	$3.40
Operating expenses per car-hour	$3.00	$3.03
Revenue per car-mile, cents	38.17	36.29
Operating expenses per car-mile, cents	32.79	32.23
Revenue per mile of track (gross)	$25,213	$24,084
Passenger car-hours operated	1,499,223	1,486,543
Passenger car-miles operated	13,721,310	13,922,372
Revenue passengers	75,518,711	73,413,026
Transfer passengers	19,838,406	19,967,265
Total passengers	95,357,117	93,380,291
Ratio transfer passengers to revenue passengers, per cent	26.25	27.20
Ratio transfer passengers to total passengers, per cent	20.82	21.36
Revenue passengers per car-mile	5.51	5.26
Rates of fare—Cash	7 cents	7 cents
—Tickets	3 for 20 cents	3 for 20 cents
Average fare per revenue passenger, cents	6.81	6.76
Car-miles per car-hour	9.16	9.37
Miles of track operated	218	220

The above shows a decrease of over two million revenue passengers carried with an increase of 200,000 car-miles operated, or more transportation with less riders. The shrinkage in the volume of business is shown by the decline in the operating revenue of $188,000, reducing the revenue per mile of track from $25,213 to $24,084. These low earnings per mile of track are an outstanding feature of the present unsatisfactory situation.

Summary of Improvements

To provide the city with adequate modern transportation facilities, many far-reaching changes will have to be made. One of the recommendations of the Beeler report is the construction of viaducts over two important downtown streets. These will then be two-level streets for short distances. It is proposed to cut through a new street for a distance of about three blocks, and to extend another for four blocks. Two connecting streets are to be widened to form a convenient route bypassing the so-called Five Points, the most congested intersection.

Sidewalk congestion is to be relieved by the construction of moving platforms underneath the present sidewalks on the most important north and south street as well as the most important east and west street. These moving sidewalks will be virtually subways without trains. From a stationary sidewalk underneath existing sidewalks pedestrians will step to a platform moving continuously at a speed of 2 m.p.h., then to a platform moving at a speed of 4 m.p.h. and, if a greater speed is desired, to a sidewalk equipped with seats and moving at 6 m.p.h.

One responsible agency to conduct a systematic plan

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of co-ordinated local public transportation including street cars and high-grade bus service is recommended. To accomplish this it will be necessary for the Georgia Railway & Power Company to make extensive changes in present car routes. Segregation of street cars away from the principal vehicular traffic lanes in the downtown section will leave these streets free for vehicular traffic. Schedules should be revised and new cars purchased. For the present it is recommended that the railway establish two bus lines. Others can be added to meet the growing transportation needs of the city.

The total cost of all these improvements will be close to $9,000,000. This will be divided roughly as follows:

Street openings and widening projects	$2,500,000
Moving underground sidewalks	3,000,000
Viaducts and approaches	2,000,000
New track construction	500,000
Fifteen standard double-truck cars	210,000
Thirty double-truck one-man cars	360,000
Power-saving devices	25,000
Fifteen buses and garage	350,000
Total	$8,945,000

Including the railway's share of viaduct cost amounting to about $500,000, the company will be called upon to spend in the neighborhood of $2,000,000. All of these expenditures will be of direct benefit to the car rider and will place the railway in a position to render service more efficiently than heretofore.

The railway's revenues are derived almost wholly from passenger receipts. Prior to April 14, 1919, the rate of fare was 5 cents. On that date it was increased to 6 cents and on Oct. 1, 1920, to 7 cents cash with 15 tickets for $1. On July 1, 1923, the ticket rate was changed to three for 20 cents. This fare is still in effect except on two lines where a special 5-cent fare is charged. With these fares under present operating conditions 11 of the 23 lines are not making sufficient to pay operating expenses.

A number of important economies can be made without impairing the quality of service. By rerouting and rescheduling a daily saving of 447 motor car-hours, amounting to $262,000 a year, can be effected. By substituting 74 trailer car-hours for motor car-hours an annual saving of $13,500 will be made. One-man operation of 381 daily car-hours would save $102,000. By the use of power-saving devices a reduction of $75,000 in power cost can be made. These total slightly more than $450,000.

Railway taxes should be readjusted. Paving assessments should be made only for the increased cost of the pavement, if any, on account of the presence of the track. Since 1902 the company has paid the city $1,717,973 for paving charges, or an average of $78,000 annually. Since 1920, with the higher prices and a rapid extension of the paving program, the average annual expenditure has been $140,000. The outlay for 1924 is estimated to exceed $200,000. These expenditures are constantly increasing the company's capital account, which results in additional charges for interest and renewals. At present the average annual cost of paving renewals is $68,000 and the annual interest charges on paving are approximately $120,000. There should be no gross receipts or special license taxes for the street car rider any more than for other riders. The abolition of the gross receipts tax will save about $100,000 annually.

Under the new plan, with more efficient operation and unfair jitney competition eliminated, it is estimated that the revenue will increase $200,000. This coupled with the savings already referred to should increase the net earnings from about $500,000 to $1,200,000. Even at that, however, the railway will hardly earn sufficient to pay a fair return on its then value, which will be in the neighborhood of $18,200,000. No provision is made by which the company recovers any past losses.

It is hoped, however, to secure additional traffic by changing the fare. A flexible service-at-cost plan is proposed. A barometric fund having its normal sum at about 5 per cent of the present annual gross revenue, or $250,000, should be provided. Whenever the cost of service exceeds the gross revenue by more than 20 per cent of this fund, namely, $50,000, reducing the sum to $200,000, the next higher rate provided in the schedule should automatically become effective on the first day of the next calendar month and continue in effect for at least one month. Should the barometric fund exceed the normal sum by more than 20 per cent, the next lower rate should automatically become effective. In no event should the fare be changed more than once in 30 days and with not less than 5 days' notice. A table of possible fare plans follows:

	A	B	C	D	E	F	G	H
Cash fare	5	5	5	10	10	10	10	10
Token rate	6@25	6@25	.....	4@25	4@25	3@25	3@25	..
Transfers	*F*	*C*	*F*	*F*	*C*	*F*	*C*	*F*
Children under 12 and school children	3@10	3@10	3@10	5	5	5	5	5

F = Free. *C* = Free only with cash fare.

It is recommended that the new plan be inaugurated with Schedule D. This will give the regular rider an immediate reduction from 6⅜ cents to 6¼ cents, which is equivalent to 7 per cent. Transfers between car lines should continue free as at present. It is estimated that this schedule will afford the railway an average rate of fare of 6.64 cents as against the present 6.76 cents.

To provide a permanent incentive for efficient and economical operation, it is proposed that the allowable rate of return on the value of the railway be adjusted so as to penalize the company when the fares are raised by diminishing the rate of return and rewarding it when the fares are lowered. A sliding rate of return is proposed to accomplish this, as follows:

Fare Schedule	A	B	C	D	E	F	G	H
Allowable rate of return:								
Maximum per cent	9	9	8½	8	7½	7	6	5
Minimum per cent	..	8	7½	7	6½	6	5	..

With the adoption of Schedule D the allowable rate of return will be a maximum of 8 per cent, with a minimum of 7 per cent. Should the railway fail to earn the minimum rate under Schedule D, and Schedule E be adopted, the allowable rate of return would be reduced automatically to a minimum of 6½ per cent with a maximum of 7½ per cent, and so on. On the other hand, when the volume of traffic and greater efficiency of operations permit the adoption of a lower fare such as Schedule C, the allowable return would be increased to a maximum of 8½ per cent with a minimum of 7½ per cent, and so on.

Thus in the event that higher rates are necessary the railway will receive a lower rate of return. When lower rates of fare are brought about the allowable rate of return will be raised.

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London Tries New One-Man Car

Single-Deck Type, with Automatic Exit Door, Similar to Those Now Used in America, Is an Innovation in England

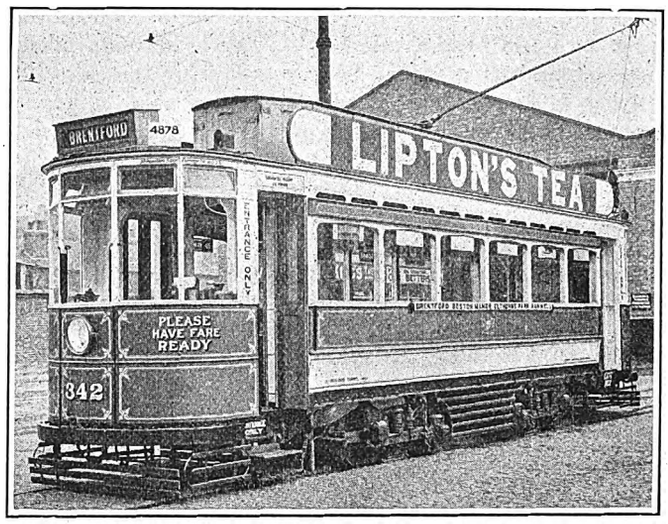
A SINGLE-DECK one-man tramcar was demonstrated on Nov. 3 to representatives of the engineering press by the London United Tramways. Safety and increased speed are two main factors which were considered in the new type cars.

In 1922 C. J. Spencer, general manager, after a visit to America, where he inspected one-man cars, began experimenting with a car of that type on a cross-country route about 2 miles long between Brentford and Hanwell, on the western outskirts of London. The experiment proved satisfactory, though the car worked in with double-deck ones on the same route. As a result an improved type has been designed. Five cars are now being built for service on the same route, which connects at each end with main routes. No double-deck cars will be used on this route. Shuttle service will be maintained, with a much closer headway than that of the double-deck cars. Except on the lines of the London United Tramways, one-man tramcars have not been tried in Great Britain.

The car has many ingenious mechanical devices, which are common in America, but have not been widely adopted in England. The doors are operated pneumatically and work in unison with the steps. Passengers board at the front end of the car and leave at the rear, an automatic treadle controlling the action of the exit door and preventing passengers from entering there, the door closing automatically as soon as the passenger has stepped down and takes his foot off the step.

The doors are prevented from opening while the car is in motion by means of a valve which shuts off the air supply except when the car is practically stationary. A dead man's handle is used on the air brake control lever. When the motorman removes his hand the brakes are applied automatically and the power shut off, irrespective of the position of the controller or brake handle.

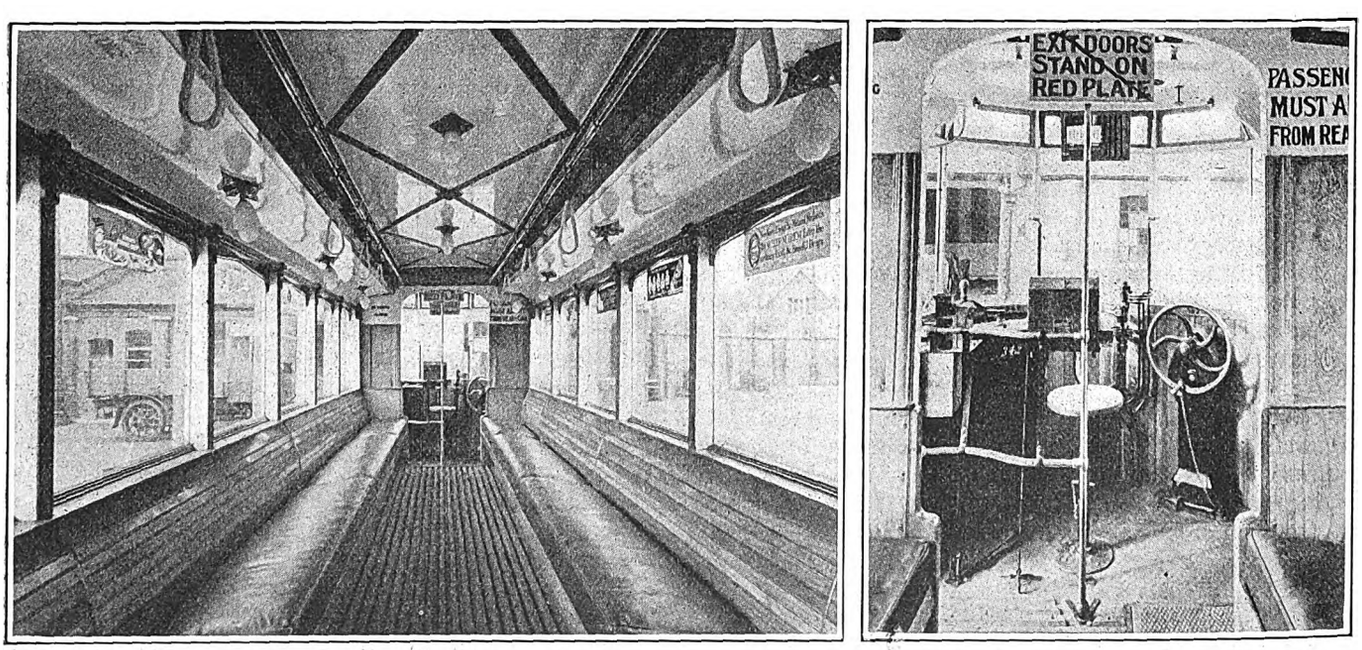
Fares are paid by the passengers upon entering the car, the regular rates being established at 1d for a short haul and 2d for the whole run. The coin is dropped into the fare box and the operator issues the ticket, which is canceled by a foot-operated punch. A change-giving machine further expedites the issue of tickets. Fare collection takes about 3 seconds per passenger. A special ticket machine is now being designed which will speed up fare collection still more.



This New Single-Deck One-Man Car Is Being Tried Out on the London United Tramways

The interior of the car is enameled white and an improved system of illumination which distributes the light more evenly gives the car a very bright and attractive appearance. Comfortable spring seats are covered in brown leather. White washable hand straps are used, and in place of the usual bell cord, extending the length of the car, a number of mechanical push bells are provided.

The driver is furnished with a seat and two large window wipers insure clear driving vision. A further improvement is a lamp fitted immediately over the ticket issuing equipment, which is automatically lighted when the entrance door is open, and switched off when it is closed, so that at night the driver is not inconvenienced by reflection on the windshield.



At Left, the Car Interior Resembles Those in Use on American Street Railways. At Right, Automatic Devices Used Include an Unlocking Exit Door, a Dead Man's Handle for the Brakes and a Ticket-Issuing Machine

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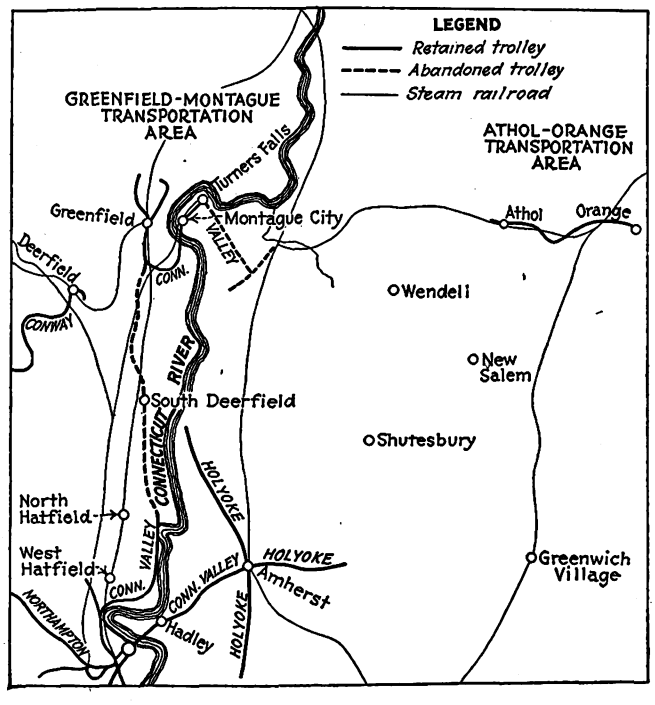
Massachusetts Towns Provide Their Own Transportation

The Towns of Athol, Orange, Greenfield and Montague Take Over Lines Abandoned by Original Owners, Forming Two Transportation Areas Under Act of 1920—One System Abandons Alternative Bus Line in Favor of Trolley—Some Details of the Enabling Legislation

THE first "Transportation Area" formed under the statute passed by the State Legislature of Massachusetts in 1920 was created in March, 1924, from a portion of the Northern Massachusetts Street Railway. Although the statute referred to sale or lease only by a majority of a board of directors, Justice Braley of the Massachusetts Supreme Court interpreted the statute as granting the same powers to a receiver. Justice Braley therefore authorized D. P. Abercrombie, the receiver of the company, to wind up its affairs to the best advantage.

As shown in the accompanying map, the greater part of the trackage in the less settled districts was abandoned and sold for junk. The most worth-while section was a route 6.76 miles long between Athol (population 10,000) and Orange (population 5,400). This was purchased for $18,484 by the town of Athol following ratification by the voters on Feb. 4, 1924. Operation by the board of trustees, comprising five members, was begun on March 24, with W. W. Woodward as chairman. George Donley, assistant superintendent of the predecessor company, was chosen superintendent. A supplementary act had to be secured from the Legislature to permit Athol to operate the portion of the road which lies within Orange. The trustees have retained the cash fare of 10 cents and the token scheme whereby 12 tokens are sold for 50 cents, but with a minimum fare of two tokens for the first of the four zones.



Publicly Owned Transportation Areas Formed from Former Private Companies. The Track Abandoned Is Also Shown

It is obvious from the price paid for the property that the trustees will not have to worry much about overhead charges, although the sale did not include power equipment, inasmuch as the railway had been purchasing power for some years in this hydro-electric territory. The title of the undertaking is "Athol & Orange Transportation Area."

Second Area in Greenfield and Montague City

The second and more important transportation area had its inception on May 24, 1924, when the citizens of Greenfield (population 15,500) and Montague City (population 7,600) voted at special town meetings to purchase 8.7 miles of track with cars and repair facilities for $62,000 from the Connecticut Valley Street Railway. Of this sum, Greenfield paid $42,966 and Montague $19,034. Operation was begun by the Greenfield & Montague Transportation Area on Aug. 1, under a board of trustees comprising George W. Cary, chairman; Charles F. Mosher, secretary; J. B. Kennedy and Stuart Winch. As superintendent this board appointed F. A. Persons, who was formerly connected with the predecessor company.

The Greenfield-Montague board has retained the fares of 10 cents cash and 12 tokens for 50 cents, with a minimum fare of two tokens in the initial zone of this four-zone system. At one time, tickets brought 30 per cent of the revenue, but owing to the decrease in steady riders this ratio has dropped to approximately 5 per cent.

In this case the receiver obtained a price somewhat better than that for scrap because the portion taken over showed an operating surplus in 1923 of about $12,000. In view of the small overhead charges, therefore, this transportation area has possibilities as a going concern. Outside of repainting the cars to an inviting orange yellow, the trustees have made but one other change of importance, viz., the abandonment of the alternative motor-bus route to Turner's Falls. A word or two on this is in order.

The trackway distance to Turner's Falls is 4.8 miles, but the highway distance is only 3.14 miles. Advantage of this was taken by jitney operators as early as 1914, but it was not possible for the Connecticut Valley Street Railway to counter the move until November, 1919, following the passage of a law in 1918 which permitted street railways to operate motor buses. The installation of a reliable hourly and half-hourly service by Mr. Abercrombie disposed of this jitney competition and also permitted a cut in car-miles. This operation eventually resolved itself into a joint 30-minute headway by motor bus and trolley with the same fare schedule on the buses between terminals. The higher

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intermediate fares were justified because of faster operation and the higher cost per seat-mile on the buses.

Since the towns themselves now own the street railway there is no fear of jitneys. Hence the alternative bus route has been abandoned in favor of a 30-minute headway on the trolley only. It is interesting that in the competition with the personal car in this territory, the newer motor buses had suffered more than the older trolley cars. It is stated that the number of riders is now only one-third of the traffic in the year 1917. This reduction may be due as much to the increase in fares as to the increase in automobiles.

The remainder of the Connecticut Valley Street Railway was disposed of as shown on the map, viz., the route between the Greenfield boundary and North Hatfield was abandoned, while the section North Hatfield-Hadley-Amherst was sold to the Northampton Street Railway.

An interesting sidelight on local transportation problems is afforded by the difference in public attitude toward bus or trolley in the three different Massachusetts areas once served by the same management.

In the territory of the Concord, Maynard & Hudson Street Railway the public permitted for 1 year a subsidy equal to taxes. When this was withdrawn, the railway was abandoned. Buses followed at once and have remained.

On the other hand, Athol and Orange were so opposed to buses that their trial was not permitted. It has already been noted that Greenfield and Montague deliberately threw out the alternative short-cut buses between Greenfield and Turner's Falls, although operated as part of the railway property. Finally, the local man who had purchased 9 miles of track extending from the Greenfield boundary through Deerfield and South Deerfield found that the public would stick to the bus. These differences in opinion are not ascribed so much to differences in service or the actual opinions of the majority, but rather to the mass in each town following the lead of a few who for one reason or another were either inclined to street cars or to buses.

Provisions of the Enabling Legislation

The state of Massachusetts has a long and progressive record in public utility regulation. In the early days it was a pioneer in such matters as control of stock issues and earnings, which did much to keep the utilities of the state on a clean-cut financial footing in pre-war days. In more recent years it has fostered the public trusteeships of the Boston Elevated and Eastern Massachusetts properties. The transportation area statutes of 1920, under which the Athol-Orange and Greenfield-Montague properties were taken over, provided for public operation of electric railways in districts where they could not be operated profitably any longer under private ownership. It was not, however, until March, 1924, that advantage was taken of this statute, as previously described.

Section 143 of the transportation area statutes of 1920 states that one or more cities or towns may establish transportation areas for freight and passenger operation of street railways existing in their territory. With the approval of the voters, such a transportation area becomes a corporation vested with the rights and obligations under the general street railway laws that would apply to a privately owned railway, including regulation by the Department of Public Utilities. The law provides that the term "Transportation Area" shall be included in the title.

Another section states that a city, by vote of its Council, subject to charter provisions, or a town by vote of its Selectmen, may make preliminary agreements with one or more railway companies for lease or purchase and operation of the properties. Such preliminary agreements are made binding upon the company following due hearing by the Department of Public Utilities, but subject to final acceptance by the voters. The department is responsible for the appraised value of the property, which shall be "upon the basis of the actual value at the time of appraisal, and not on the cost of replacement." Within 60 days after due advertisement of such a preliminary agreement and appraisal the voters are asked to decide if the agreement for public operation shall be accepted. If approved by a majority of the voters the mayors, city councils and selectmen may proceed to the final agreement, subject to a few reservations made by the Department of Public Utilities.

Control Vested in Trustees

According to the statutes (Section 146) the management and control shall be vested in a board of trustees, two of whom shall be chosen by the Mayor of each city concerned, with the approval of the City Council, and two by the Selectmen of each town concerned. These trustees are selected for 2-year terms, with an initial 1-year term for one trustee in each case. For a transportation area established by a single city or town a board of five members is to be appointed, one member being chosen annually. These trustees, who may be removed for cause, are not deemed public officers, and cannot incur personal liability as such. No stated salaries are provided, but they may be paid $10 for each meeting attended, provided the total does not exceed $300 a year. Stockholders of street railways affected are not eligible as trustees.

These trustees have full power to operate, lease or sub-lease a property, subject to approval by the Department of Public Utilities. They can appoint, compensate and remove officers, managers, and assistants. Upon the request of such a board the department shall take, by eminent domain, on behalf of the transportation area, all or part of a property which the company has ceased to operate for more than 90 days. This, of course, is subject to approval by the voters.

An important clause of the act (Section 150) provides that "the cities and towns comprising a transportation area shall contribute to the discharge of its liabilities and obligations on the basis of one-third part, according to the single-track street railway mileage within the town limits, one-third part according to their population, and one-third part according to their assessed valuation. The department shall establish the said basis at least once in three years."

Deficits must be made up by the different communities in proportion to their respective interests, and must be provided for in the tax levy for the year following the financial (calendar) year of the transportation area. Should there be a surplus, 85 per cent shall be distributed among the communities in proportion to their respective interests, the remaining 15 per cent being held as a reserve to meet possible deficits. In making the calculation, not less than 3 per cent nor more than 5 per cent of the book value of the property shall be charged off as depreciation.

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For the purpose of acquiring street railways, the transportation area, with the approval of the Department of Public Utilities, may borrow money in excess of the statutory limit, but not exceeding 2 per cent of the assessed valuation. The trustees may also issue notes for current expense for terms not exceeding one year, subject to approval by the department.

The department has authority to exclude any community from a transportation area, but such exclusion shall not prevent the operation of street railways in or through its territory. The department may also permit a transportation area to operate into an adjoining state.

It is provided (Section 155) that the rental of a leased property shall not exceed 7 per cent of the price fixed in any option to buy. No lease shall be made for more than 5 nor less than 2 years, but a lease may be renewed if approved by the department as a matter of public necessity and convenience. Rentals shall be paid at least once in 6 months, and 4 months advance notice must be given to the owners of the property in case of a renewal of the lease. A lease may be terminated by consent of a majority of the stockholders, or by a majority of the voters to an election which is called upon petition of 10 per cent of the registered voters.

The fares established by the trustees, subject to the department's approval, shall be such as "will reasonably assure sufficient income to meet the cost of the service, including operating expenses, taxes, rental, interest, and the allowance for depreciation required," as previously mentioned. The trustees are required to maintain the leased property in good operating condition, so that if restored to the owner it must be in as good operating shape as when taken over, ordinary wear and tear excepted. A provision must be included in all leases, whereby any question of damages will be submitted to the department within 90 days from the date of expiration, and decision by the department shall be final.

As to taxation, it is provided that nothing in the act "shall affect the right of the Commonwealth, or any subdivision thereof, to tax the property owned or leased by a transportation area in the same manner and to the same extent as if it were under private management, but cities and towns may abate in whole or in part the taxes thereon." This provision continues the railway subject to such state imposts as the excise tax of 1898, but allows it to be relieved of purely local burdens. It may be stated here that during the last 5 or 6 years the Connecticut Valley Street Railway and associated companies were tacitly relieved of paving assessments, because the communities realized the impossibility of getting blood out of a turnip.

963 Buses Ordered in 1924

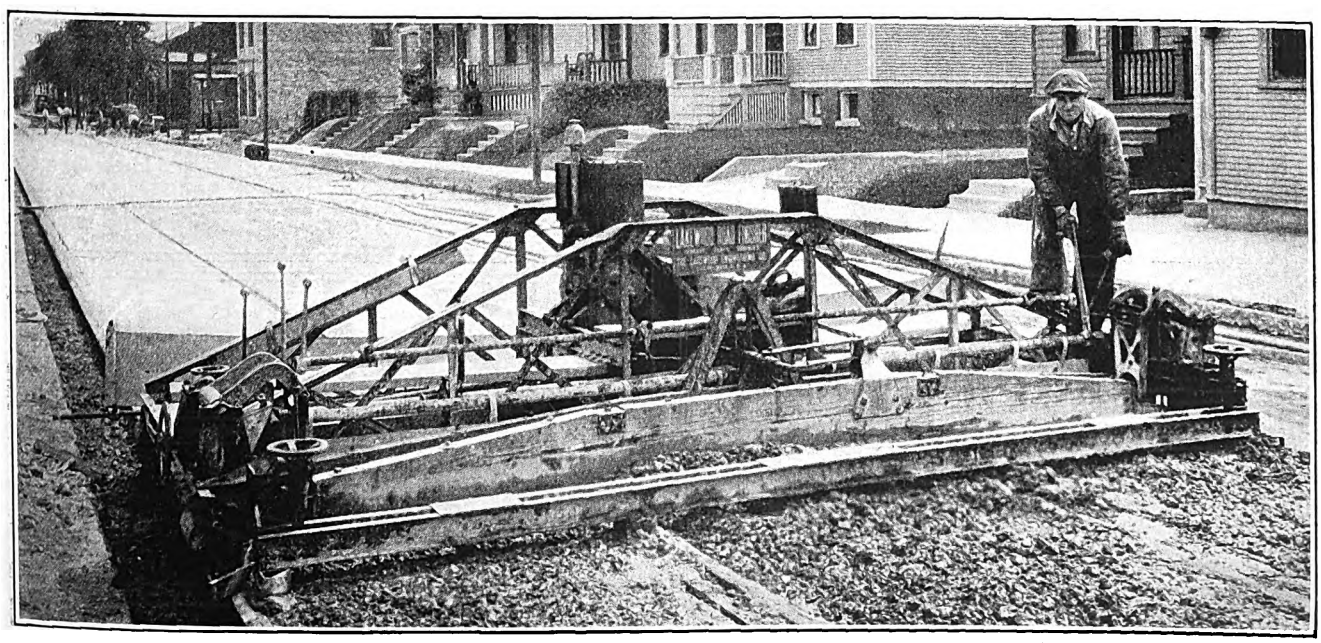
THE survey conducted by this paper covering the number of buses owned by electric railways and the number purchased during the past year shows a total of 963 ordered. This figure appeared incorrectly in the table published on page 8, issue of Jan. 3.

	Motor Buses Ordered	Trolley Buses Ordered	Other Automotive Equipment Ordered	Total
1922	240	6	112	358
1923	621	15	148	784
1924	963	7	105	1075
Increase 1924 over 1923	342	8*	43*	291

*Denotes decrease.

Machine Speeds Up Concrete Finishing

THE latest addition to the equipment of the way and structures department of the Milwaukee Electric Railway & Light Company is a road finisher specially fitted to level and finish concrete pavement. The supporting wheels of this machine are so spaced as to ride on the outside rails of a double track. Four trowels are arranged to cut the flangeways on the insides of the rails. In other respects the machine is similar to those used for spreading, tamping and surfacing concrete highways. It is a self-propelled machine, being driven by a gasoline engine, with dual control levers, which allow it to be operated from either side. The operator rides the carriage as shown in the accompanying illustration. The apparatus was built by the Lakewood Engineering Company, Cleveland, Ohio.



Hand Labor Finishing the Surface of Concrete Track Paving in Milwaukee Has Been Eliminated by This Machine

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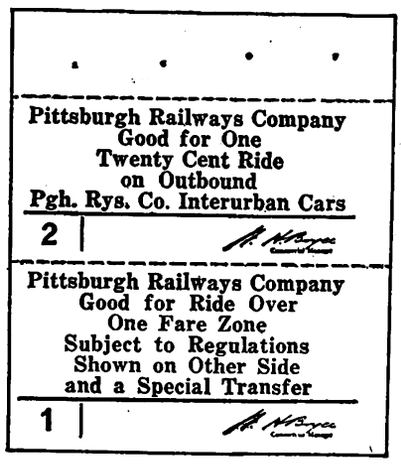
Coupon Books Arranged to Extend Transfer Privileges

TWO types of special tickets, one colored robin's egg blue and the other pink, have been adopted by the Pittsburgh Railways, with a view to extending the transfer privileges of passengers on the Harmony and Mars interurban lines. One type of ticket is made up in pads of six leaves, each leaf consisting of three coupons. The first coupon is good from the suburban terminus of the Pittsburgh Railways into the city, and entitles the holder to a regular transfer such as is issued to city passengers. The second coupon is good on the return trip from any point reached by the transfer to a connection with the interurban route. A third coupon is accepted on outbound Harmony and Mars cars as far as the end of the Pittsburgh Railways line. The pads are sold to the public at $1 each.



This Style of Coupon Has Been Devised by the Pittsburgh Railways to Afford Special Transfer Privileges for Interurban Passengers

On Sundays there are special transfer privileges on a 10-cent cash fare instead of the 8⅓-cent token fare. A second booklet, containing five leaves of three coupons each, and selling for $1, is designed to give the interurban passengers these special Sunday privileges. Assuming that the interurban passenger desires a transfer, this saves 16⅔ cents for a round trip on week days, and 13⅓ cents for a round trip on Sundays.

These books are intended only for the use of the regular patrons of the Harmony and Butler short-line route, and are sold only by the conductors on these cars, in order to prevent the excessive overcrowding which might result from the issuance of transfers on a regular token fare paid on these cars.

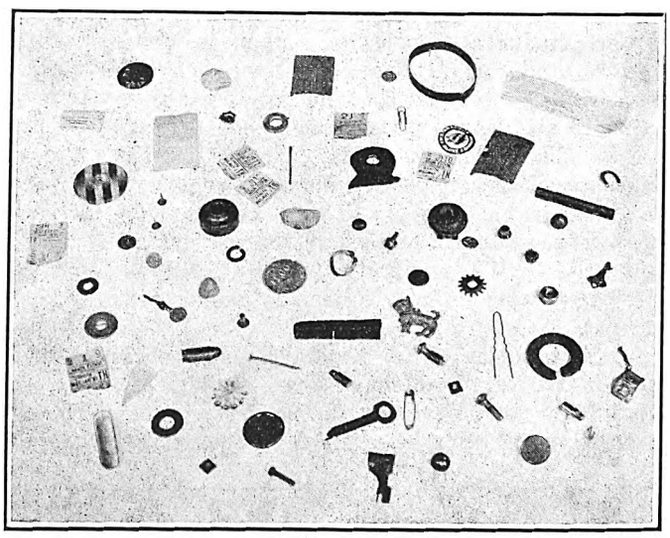
Emergency Valve for One-Man Cars

THE laws of Massachusetts require that all street railway cars operated by one man shall be equipped with apparatus to perform three distinct functions. There must be suitable arrangements so that any passenger, by pulling an emergency cord, can apply the brakes, shut off the power, and release the doors. The device adopted by the Middlesex & Boston Street Railway to accomplish this consists of a three-way valve which normally provides connection from the air reservoir to the brake valve. When this is thrown to the emergency position by a passenger pulling a handle suspended from the roof of the car, air reservoir pressure is connected directly to the brake cylinder and to the circuit breaker and door unlocking mechanism.

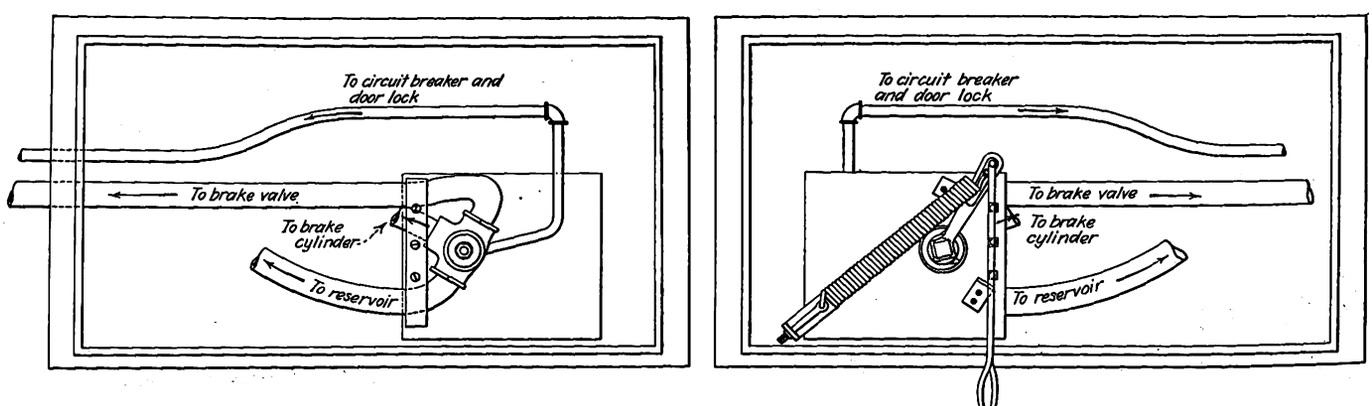
The apparatus is located in a box suspended from the ceiling of the car. A pull cord hangs down where passengers easily can reach it. The outside of the box is labeled "For emergency only—to stop car pull cord." Pulling the cord rotates a handle attached to the valve and held in position by a spring. The rotation throws the spring over center and the valve is then held open by the same spring which ordinarily holds it closed.

Railway Collects Souvenirs

THE articles in the accompanying illustration are not parts of a well-known make of automobile nor the contents of the gizzard of an ostrich who got his breakfast in a machine shop. They are the odds and ends, trinkets and gewgaws, dropped by passengers into the fare boxes of the pay-as-you-enter street cars of the Illinois Power & Light Corporation at Champaign, Ill. Among them are washers, combs, marbles, safety pins, hairpins, keys, screws, nails, bits of glass, theater checks, nuts, bolts, lockets, pebbles, matches, tacks and a 38-caliber cartridge. Similar trinkets are found on all the city systems operated by the company.



Some Trinkets Found in Champaign Fare Boxes



Front and Back Views of Emergency Stop Device Designed by the Middlesex & Boston Street Railway for One-Man Converted Cars

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Purchased Power for Illinois Central

Contract Between Railroad and Commonwealth Edison Company Provides for Supply of All Energy Required in Electrified Chicago Terminal Zone—Seven Substations, Totaling 40,500-Kw. Capacity, to Be Owned and Maintained by Edison Company

AN IMPORTANT step in the completion of its plans for electrification of the Chicago Terminal District was recently taken by the Illinois Central Railroad, which has entered into a contract with the Commonwealth Edison Company of Chicago, to supply all of the power requirements for this project. While the purchase of energy instead of its generation has become the generally favored practice among railways, this is one of the largest contracts of the sort executed up to the present time. Some of the general basic principles included in the new Illinois Central-Commonwealth Edison contract are of general interest as indicating recent practice in large power contracts of this type.

This contract is made for a term of 10 years, commencing Jan. 1, 1927, or any earlier or later date (not later than Jan. 1, 1928) with provision for four extension periods of 5 years each. The estimated load calls for an initial capacity of 40,500 kw. This will be converted in seven substations to be owned and operated by the power company. The substations are to be constructed upon property either owned or leased by the power company, or upon right-of-way of the railroad company. When located on the railroad right-of-way, a small nominal rental will be charged the power company, providing that at least 80 per cent of the substation capacity is used for the railroad requirements. The power company is given the right to distribute energy from the substations to other customers, but if in any year the amount of energy so distributed exceeds 20 per cent of the entire output of the station, provision is made for charging a higher rental for the property on which the station is located.

Energy will be supplied in three forms, i.e., (a) direct current at 1,500 volts nominal; (b) 60-cycle, three-phase, four-wire power at 4,000 volts nominal between phases; (c) 60-cycle power at such other voltages and phases as may be mutually agreed upon. The underground transmission and distribution lines for supplying the railroad energy requirements may be constructed on the railroad's right-of-way, and provision is made in the contract that the number, capacity and distribution of such lines will be such as to permit any one to be cut out without interrupting the delivery of the required amount of energy. Provision is also made to avoid fluctuations in potential of the direct current, which is to be delivered at a nominal voltage of 1,500. It is specified that this shall not exceed 1,550 volts nor be lower than 1,400 volts. Under normal conditions the frequency and voltage are not permitted to vary more than 5 per cent above or below the normal figures.

Provision for Additional Power

Under the terms of the contract the power company agrees to provide sufficient generating, transmitting and converting equipment at all times, but the railroad is required to give at least 12 months' written notice of any expected substantial increase in traffic or business which may necessitate the installation of additional generating, transmitting or converting equipment.

The seven substations originally specified in the contract will be spaced at intervals of 5 to 7 miles along the railroad right-of-way. Provision has also been made for additional 1,500-volt direct-current substations where it may be found later that energy cannot be economically transmitted from the existing ones. Such additional stations will be installed upon written request from the railroad company, specifying the approximate location, the estimated amount of additional energy required and the approximate date of first delivery. Notice of new substation requirements must be given at least 12 months before operation is contemplated. The additional power required must be not less than 3,000 kw., and the railroad company is obligated to provide a site for the new station unless the power company has a site of its own available.

In the event that the contract is not extended for more than one 5-year period after the original 10-year term, provision is made to protect the power company from loss on its investment in substation apparatus. The railroad is then required to purchase all such apparatus which has been installed in any substation for supplying direct current for traction service. Even though the contract is extended for more than one 5-year period, the railroad company must purchase, at its termination, any apparatus which has been in service in substations for a period of 15 years or less, except that which the power company elects to use for other purposes. Under this clause of the contract the railroad has an option to buy any or all of the substation equipment, at the termination of the contract, which the power company has erected on the right-of-way of the railroad. The purchase price is to be determined by agreement between both parties, giving due consideration to replacement costs, obsolescence, normal depreciation and conditions with respect to repair and serviceability of buildings or equipment. If no agreement can be determined, the purchase price is to be referred to an arbitration board.

Extensions of the contract for terms of 5 years may be made by the railroad company four times, upon written notice one year in advance of expiration of the previous term. Even if such extensions run later than May 31, 1947, the contract is to terminate on that date, unless prior to that time the Edison Company is permitted by legislation to operate in at least as ample or broad a manner as at present.

Determination of Demand

After the end of each calendar month, the railroad company's maximum demand will be determined by selection of the 3 hours from the specific month (one to be taken from each of three different days) in which the aggregate output of power is greater than that supplied in any other 3 hours in the month. One-third of the aggregate number of kilowatt-hours taken during the 3 hours selected is to be considered as the number

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of kilowatts constituting the railroad company's maximum demand for that month, provided that in ascertaining the figure a period of abnormal demand has not been selected. If in any month every hour selected should be one of abnormal demand, the maximum demand for that month is to be the number of kilowatt-hours constituting the maximum demand for the last preceding month in which the maximum demand was ascertained as described. An abnormal period is considered to be one during which there is extra heavy railroad traffic, abnormally low temperature or other unusually severe weather conditions. In the event of abnormally heavy railroad traffic which continues beyond ten consecutive days in any month, the maximum demand will be determined as previously outlined, but will not be used in determining the load factor for that month. Should the total usable surplus generating, transmitting and converting capacity of the power company at any time be insufficient or unavailable to enable it to supply the railroad company a portion of the excess energy in an abnormal period, the railroad will be required upon notice by telephone or otherwise to refrain from drawing such portion of excess energy until notified.

Basis of Energy Charges

Rates for energy to be charged under the contract are made up on a sliding primary charge, based on maximum demand, and a sliding energy charge based on the number of kilowatt-hours drawn. The primary charge is the same for all demands up to and including 5,000 kw.; about 8 per cent less between 5,000 kw. and 10,000 kw. inclusive; about 13½ per cent less for 10,000 to 15,000 kw. inclusive, and 19 per cent less for demands in excess of 15,000 kw.

The energy charge, expressed in mills per kilowatt-hour, is the same for consumptions up to and including 5,000,000 kw.-hr. per month. It is about 0.8 per cent less for consumptions between 5,000,000 kw.-hr. and 7,500,000 kw.-hr. inclusive, and 1.5 per cent less for consumptions in excess of 7,500,000 kw.-hr. The secondary or energy charge is based on 10,500-B.t.u. coal at $4 per ton and is subject to increase or decrease depending upon the average cost and heating value of coal. Whenever the average cost of the coal or its calorific value departs from this basis for any month, the energy charge will be calculated according to the following formula:

$\frac{\text{Cost} \times 10{,}500}{\text{heat units}} + 2.5 =$ Mills per kilowatt-hour for consumptions up to and including 5,000,000 kw.-hr. per month.

$\frac{\text{Cost} \times 10{,}500}{\text{heat units}} + 2.45 =$ Mills per kilowatt-hour for the excess over 5,000,000 kw.-hr. and up to and including 7,500,000 kw.-hr. per month.

$\frac{\text{Cost} \times 10{,}500}{\text{heat units}} + 2.4 =$ Mills per kilowatt-hour for the excess over 7,500,000 kw.-hr. per month.

In this formula, the cost is the weighted average cost per ton to the power company of all coal delivered to it during the preceding 12 months, including freight, switching and car service charges and the cost of storing and handling the coal. No increase in the secondary energy charge becomes effective unless such increase is consistent with a contemporaneous general change in the cost of mining coal in the states of Illinois, Indiana and Kentucky, and in the cost of transportation of coal to Chicago. No adjustments due to change in calorific value are to be made unless the B.t.u. per pound exceeds 11,000 or falls below 10,000.

The railroad guarantees that during each month of the contract the total consumption of energy in kilowatt-hours will not fall below 30 per cent of the equivalent of its maximum demand, and that its total aggregate payment will not be less than such a load factor would require.

Provision for Metering Energy

Meters for determining the maximum demand and energy consumption are to be installed by the power company at its own expense. The energy is considered to be delivered to the railroad at the point where the feeders leading from the substations intersect the railroad company's right-of-way. All watt-hour meters will be tested and calibrated monthly in the presence of representatives of both parties when desirable, and any meter found to be not more than 1 per cent away from normal is to be considered correct. If any meter exceeds this limit of accuracy, readings will be corrected by the per cent of inaccuracy found, but no correction will extend back beyond 30 days previous to the finding of the inaccuracy. If any meter is tested at the request of the railroad company and the registration is found within 2 per cent of accurate, the railroad company will be required to bear the expense of the test. All other tests are to be made at the expense of the power company.

Interruptions of Service

In case of interruption or failure of power supply, the primary demand charge for that month is to be proportionately reduced, and if the inability to supply energy causes the railroad's load factor to fall below the guaranteed amount, the railroad is relieved of the guarantee for the corresponding month and the average secondary charge is not to be made at a higher rate than the average secondary charge during the preceding normal month. Furthermore, if the railroad is prevented from operating regular train service due to causes beyond its control, the minimum load factor of 30 per cent is not to apply for this period. The minimum load factor will apply only during those days in which the railroad has not been prevented from operating its regular service.

The contract also stipulates a recognition on the part of the power company that the railroad must receive regular uninterrupted service, and provision has been made whereby the railroad can cancel the contract if trouble with the character of service is not remedied within 90 days from the date of complaint. However, the railroad is required to give the power company 30 days notice in writing of its intention to cancel the contract, stating the date of its proposed termination. If this is done, the contract is to terminate upon the date when the railroad company is able to obtain elsewhere energy necessary for the operation of its lines. Until such date, the power company is required to supply energy in accordance with the terms of the contract.

If at any time the power company supplies energy to any other railroad, at a lower rate which is not justified by different conditions of service, making the cost of production and distribution to the other consumers relatively less than to the Illinois Central Railroad, the latter is to be entitled to a reduction in its rates equal to that portion of the difference as shall not be justified by the difference in conditions.

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In case of any railroad accident or abnormally heavy railroad traffic, the railroad company is required to give the power company immediate notice by telephone or otherwise. At the termination of such abnormal periods the parties to the contract are to agree, if possible, on the duration of the abnormal period and if they are not able to agree within 10 days the subject is to be submitted to arbitration.

ARBITRATION BOARD

Any differences of opinion arising between the two parties with respect to their rights and obligations, which cannot be settled otherwise, are to be referred to a board of arbitrators, consisting of three disinterested persons. One is to be chosen by each of the parties. These two are to select a third arbitrator. If they cannot select a third member within 20 days after their appointment, the third arbitrator is to be chosen by the senior judge of the United States District Court of the eastern district of the northern division of Illinois. In case the railroad company disputes and desires to submit to arbitration any bills rendered by the power company, the railroad will be required to pay those bills within 30 days without prejudice toward its rights to recover any sum which the decision of the arbitrators may find to be overpayment, with interest at 6 per cent. Compensation of the arbitrators is to be paid in equal parts by the two parties to the contract.

Buses Link Industrial with Residential Section

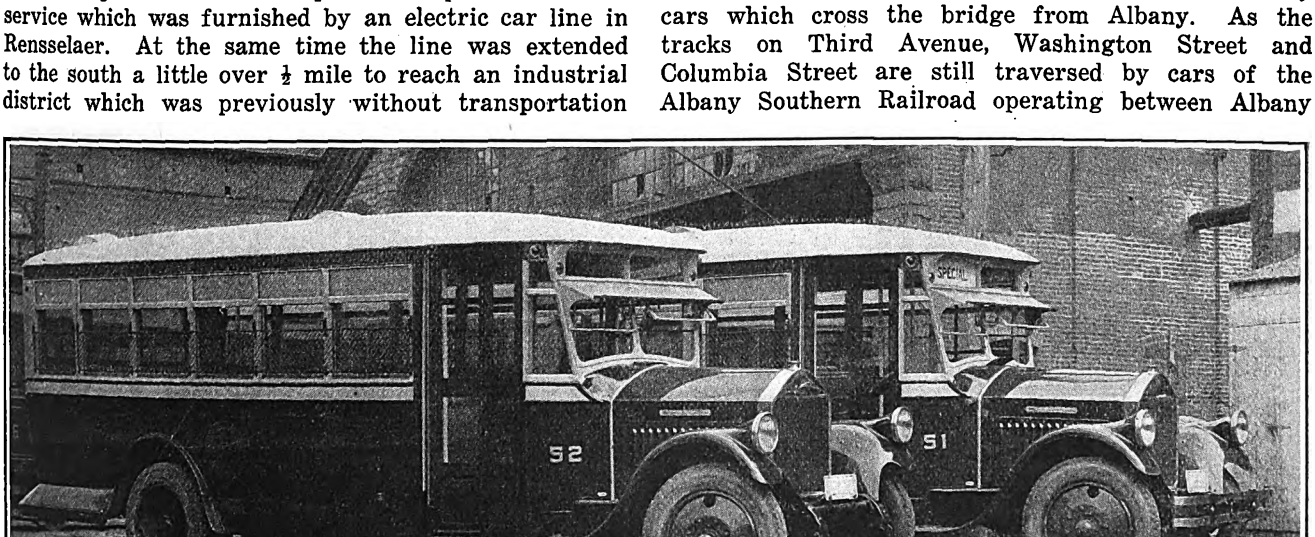
Two Buses Replace Shuttle Car Service in Rensselaer, N. Y., and Provide Extensions to Sections Not Previously Served

AN ORDINANCE permitting the operation of buses by the Capital District Transportation Company, Inc., a subsidiary of the United Traction Company, Albany, N. Y., was adopted by the Common Council for the city of Rensselaer in June, 1924. Operation began on Sept. 24. This bus operation replaces a shuttle service which was furnished by an electric car line in Rensselaer. At the same time the line was extended to the south a little over ½ mile to reach an industrial district which was previously without transportation service, and to the north it was extended for nearly a mile to include a residential section. Industrial and residential sections are thus joined so that the service is improved over that originally furnished by the car line. The buses have been routed during certain hours of the day along East Street, to reach a school and a church in that section and also to serve residents who were without transportation. This latter routing is experimental. It is being done to make certain whether or not the traffic warrants service through this section. If it does, the car routes can be rearranged readily.

DIMENSIONS AND EQUIPMENT DETAILS OF RENSSELAER BUSES

Operating company	Capital District Transportation Company
Number of buses in this service	2
Chassis	Pierce-Arrow Model Z
Wheelbase	196 in.
Front tread	68 in.
Rear tread	89 in.
Turning radius inside wheels	37 ft. 6 in.
Wheels	Budd-Michelin
Tires	General Pneumatic cords 36x6, dual rears
Engine	4-in. bore, 5½-stroke
Ignition system	Delco, double
Engine starter	Delco
Lubrication system	Alemite
Axle bearings	Timken
Brakes	Service on drive shaft, emergency on rear wheels
Body manufacturer	Bender Body Company
Type body	Pay-enter
Length over all	16 ft. 4 in.
Height inside	6 ft. 4 in.
Width inside	6 ft. 10 in.
Seating capacity	25
Seats	Hale-Kilburn 208 de luxe
Seating material	Spanish leather
Interior trim	Mahogany
Headlining	Exposed carlines, white enameled
Roof material	Canvas
Window guards	Outside, stationary
Ventilators	Nichols-Lintern
Signal system	Faraday
Destination signs	Hunter, roller
Doors	Folding, hand operated
Heater	Exhaust
Lamps, interior	Six 21 candlepower
Fare registers	Ohmer
Rails and straps	Porcelain with sanitary grips
Emergency door	At rear right hand side, mechanically controlled from driver's seat
Painting	Red body, cream trimmings, buff roof

An accompanying map shows the route of the bus line as it is now operated and also the shuttle service which was previously furnished by the electric cars. The portion of the line along Broadway between the Hudson River bridge and Partition Street is also served by cars which cross the bridge from Albany. As the tracks on Third Avenue, Washington Street and Columbia Street are still traversed by cars of the Albany Southern Railroad operating between Albany



New Buses Uses to Give Improved Service in Rensselaer, N. Y.

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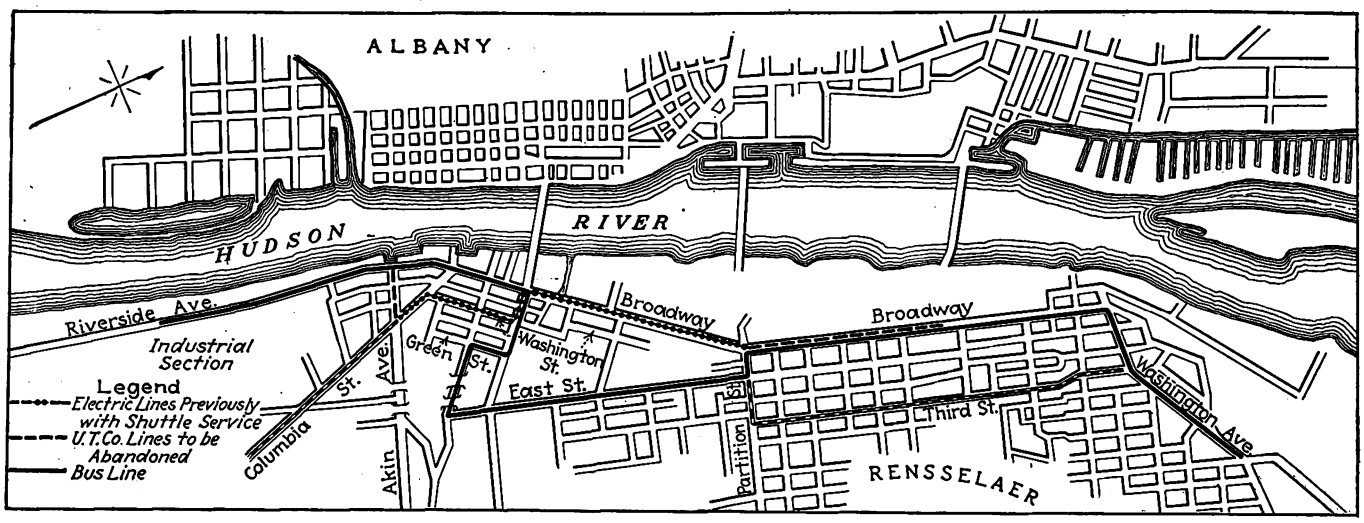


Map of Rensselaer Showing Bus Line and Electric Line Previously Operated as Shuttle

and Hudson, N. Y., the only part of the electric line to be abandoned is a section along Broadway north of Partition Street and a short section along Akin Avenue.

At present two buses are used for the service. These have bodies made by the Bender Body Company, mounted on Pierce-Arrow Motor Car Company's model Z chassis. The buses, which are of the pay-enter type, seat 25. The accompanying table gives the principal dimensions and details of construction.

Where possible, the various items of equipment used on these buses are the same as those used on the trackless trolley vehicles operated by this company in Cohoes, and which were described in the Dec. 13 issue of ELECTRIC RAILWAY JOURNAL. Particular attention has been given to providing an attractive and comfortable bus throughout. The Hale & Kilburn type 208 de luxe seats give comfortable riding, and a clear height inside of 6 ft. 4 in. gives headroom for standing passengers. Special attention has also been given to providing an efficient lighting system. The illumination at night is furnished by six 21-cp. lights. An emergency door on the rear right-hand side is mechanically controlled from the driver's seat. The exterior painting is standard United Traction Company's color design with red body, cream window posts and buff roof.

Fifty Reasons for Traveling Traction

AN ADVERTISING campaign is being conducted by the Indianapolis & Cincinnati Traction Company in five daily newspapers along the line. One good reason for "traveling traction" is given in each advertisement. The same heading is used all the time in all the papers. The first appearance was on Sept. 1, and one advertisement was published every second day, after that time. In all, 50 were published, ending Dec. 26. Among the reasons presented are the following:

It is a problem to find parking space in Indianapolis. A man saves lots of time leaving his auto at home when he goes to the city.

The I. & C. makes a real low rate on Sunday. A fine thing for the fellow who works all week and wants an outing on Sunday. Only a dollar between any two stations on either division.

The cars carry fresh ice water. This is a little thing but it means a lot in hot weather, and the I. & C. coolers are according to government regulations, with the ice separate from the water.

The I. & C. has careful, well-trained men. They are making a wonderful record for safe operation.

The I. & C. is a Hoosier institution, home managed—home owned, a vital part of the community.

Everybody prefers to ride steel cars. All of the new I. & C. cars are steel.

The interurban lets the city man live in the country and the country man work in the city. It is so easy to go back and forth every day.

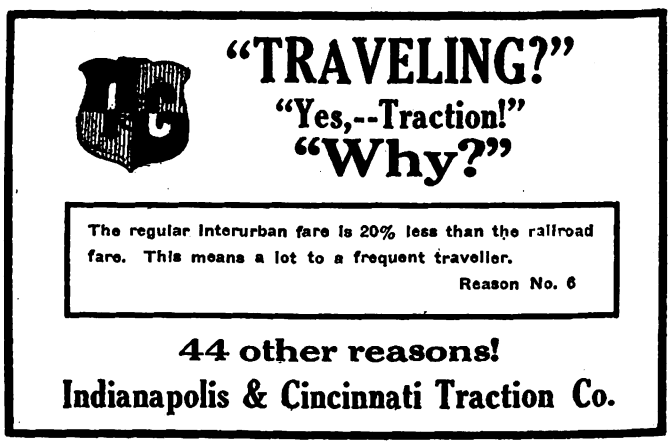
The train schedule is dependable all the year around. The cars run rain or shine, snow or sleet, and maintain splendid service.

The I. & C. has low commutation rates for the daily traveler. The rate from here to Indianapolis is only — cents.

The traffic rules in Indianapolis change so fast it is hard to keep out of jail. So much easier to leave the auto at home and take the traction.

The traction line checks 150 lb. of baggage free and a man can take almost any amount of excess right along with him, usually on the same car.

The I. & C. trainmen are always courteous and thoughtful in helping elderly people and children. They never run off and leave you, either.



This Heading Is Used in All the Papers All the Time in the Advertising Campaign of the I. & C.

The I. & C. cars have such broad, roomy, comfortable seats. There is plenty of leg room, too—comfort for both tall and short.

A man can put in a busy day, catch the traction and get all cleaned up before he gets home. The toilet facilities on the cars almost equal a Pullman. Plenty of room.

The I. & C. cars are kept clean. Ever notice that there is no noisy fare register; no cash fare receipts littered on the floor? Even the bell cord is strung along the side of the car. The cars must be cleaned daily.

Too many driving hazards—fool driver—speed fiends at cross roads—road hogs. The interurban is safe. No worries about getting your auto stolen either.

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Clearing Trouble on Underground Feeder Sections*

A COMPLETE set of general instructions for the clearing of trouble on underground feeder sections has been completed during the year by the United Railways & Electric Company of Baltimore, Md. This has been prepared by Adrian Hughes, Jr., superintendent of power, in co-operation with his foremen. The instructions give in detail directions for the manner of procedure on every section of the company's lines in case of trouble. The instructions for each section embody a number of tests to determine the location of the break or seat of trouble. The first test in each instance is for the cause which experience shows would be most likely to be responsible for trouble in that section. The second test is for the next most likely cause, and so on.

These instructions in handling grounded sections are intended to be of aid in locating and correcting trouble quickly. Such instructions cannot be written for every specific case, and it is, therefore, necessary to cover in a general way all cases of trouble that can be foreseen. The linemen, of course, are supposed to use their judgment in applying the instructions and to be guided by the results obtained from the different steps.

The general rule for grounded sections is first to inspect the overhead portion of the section, i.e., the trolley wire and the overhead feeder; and then to separate the underground portion of the section, i.e., the underground feeder, beginning as near the middle point as possible. In this way the various portions of the section will be eliminated until the trouble is found.

A test lamp is considered useful in this work. The testing outfit consists of either a single lamp in series with a suitable resistance, or a five-light cluster, so that it can be safely connected between a source of 600-volt energy such as the trolley wire, or a live feeder or switch and the ground. By connecting to such a source of energy and touching the test point to a cable which has been separated from the rest of the circuit, it is possible to determine whether or not this cable is grounded. If the lamps light the cable is grounded, and if they do not light it can usually be assumed to be in good condition. The testing outfit should always be tried out before and after making a test to be sure a lamp is not burned out or other trouble developed in it. For instance, after connecting the lamp to a source of energy such as a live trolley wire or a live switch it should be connected to a known ground such as the rail or a negative wire. If the lamp lights and burns at normal brilliancy it shows the testing outfit is in good condition. It then is safe to make the test on the underground cable or other portion of the circuit. Upon completion of the test the test point should again be touched to the ground to be sure the testing outfit is in good condition and did not give a false indication.

The distributing lines in Baltimore are divided into some 70 sections, designated by the name of the street or portion of the street where the feeders are located. Specific instructions have been worked out for each section, the conditions having been studied carefully so that there is little opportunity for guesswork on the part of the tester as to the proper procedure to make to locate trouble. The instruction sheets for several of the sections which follow indicate the general form.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

Baltimore Street Section

Central Substation No. 3

First go over trolley wire.

If No Overhead Trouble Is Found:

CABLE No. 8—Open switch on cable No. 8 on pole south side Baltimore Street opposite east B/L Charles Street. Have substation test No. 8 cable.

IF No. 8 IS GROUNDED—Have substation cut out No. 8 cable and close breaker.

IF No. 8 IS CLEAR—Close switch on cable No. 8 and proceed to Baltimore and Eutaw Streets.

CABLE No. 52—Open switch on cable No. 52 on pole south side Baltimore Street 50 ft. east of east B/L Eutaw Street. Have substation test cable No. 52.

IF No. 52 IS GROUNDED—Have substation cut out No. 52 cable and close breaker.

IF No. 52 IS CLEAR—Close switch on cable No. 52 and proceed as follows:

CABLE No. 116—Open all switches on cable No. 116 located on south side Baltimore Street as follows: east of Paca Street —50 ft. east of Eutaw Street—southeast corner Sharp Street—opposite east B/L Charles Street—southeast corner Light Street.

Test No. 116 with test lamp at either Charles Street or Eutaw Street.

East Baltimore Street Section

Pratt St. D. C. Board No. 4

If Two Crews Are Available, One at Caroline Street and One at Lombard Street:

CAROLINE STREET CREW—Starting at Baltimore and Caroline Streets proceed east to Broadway and south to Gough Street. If no overhead trouble is found, return over section to meet other crew.

LOMBARD STREET CREW—Starting at Baltimore and Calvert Streets proceed east to Caroline Street. If no overhead trouble is found, continue over section to meet Caroline street crew.

If No Overhead Trouble Is Found by Either Crew:

CABLES No. 15 AND No. 24—Lombard Street crew shall open switches at Baltimore Street and Market Place on cables Nos. 24, 63 and 64 and switch at Baltimore and Holliday Streets, on cable No. 15. Call Pratt Street D. C. Board to test cables Nos. 15 and 24. If either, or both of these cables test clear, close switches at Holliday Street and at Market Place but do not close switches on Nos. 63 and 64 until all switches have been opened and cables tested with test lamp.

CABLES No. 63 AND No. 64—Caroline Street crew after meeting Lombard Street crew will open switches on cables Nos. 63 and 64 at the following locations: Broadway and Gough Street, Broadway and Pratt Street, Broadway and Baltimore Street, Baltimore and Caroline Streets, Baltimore Street and Central Avenue, Baltimore and High Streets.

Return to Baltimore and Caroline Streets, close cross-connecting switch with Caroline Street section. Then test cables Nos. 63 and 64 with test lamp at this location. If either, or both of these cables show clear, close in switches on clear cable at the location given above and then meet Lombard Street crew at Baltimore Street and Market Place.

If cable No. 24 is O.K. and has been closed in, close switches on either No. 63 or No. 64, or both, if they are O.K. at Baltimore Street and Market Place.

If Only One Crew Is Available:

First go over trolley wire.

If No Overhead Trouble Is Found:

Return to Baltimore Street and Market Place and proceed as above for cables Nos. 15 and No. 24. Then follow procedure for cables No. 63 and No. 64.

Belair Road Section

Northern Substation No. 7

First go over trolley wire.

If No Overhead Trouble Is Found:

CABLES Nos. 84, 85 AND 163—Open switches on Belair Road as follows: Nos. 84 and 85 at northwest corner of Brehm's Lane, No. 163 at southwest corner of Brehm's Lane, Nos. 84 and 85 at Clifton Park gate, Nos. 84 and 85 at No. 2346, Nos. 84 and 85 at Lyndale and 84 and 163 at Ravenswood Avenue.

Have operator at Northern substation test cables and close switches on clear cables.

Boulevard Section

Northern Substation No. 7-1

First go over trolley wire, observing the following route. St. Paul Street to 31st Street, to Greenmount Avenue, back to University Parkway, then open switch that controls the Guilford extension. If power comes on it indicates trouble on Guilford extension. Continue over University Parkway to Roland Avenue, then south to Overhill Road to Charles Street Avenue, to Guilford terminus, then south to University Parkway.

If No Overhead Trouble Is Found:

CABLE No. 154-A—Open switches on cable No. 154-A, located on St. Paul Street at 31st Street, at 29th Street, and at 26th Street.

If Section Does Not Clear Up:

CABLES NOS. 154 AND 155—Open switches on cables Nos. 154 and 155 at northwest corner of Greenmount Avenue and 31st Street.

Then call operator at Northern substation. If operator reports section as still grounded, send driver to St. Paul Street and University Parkway to close switch that controls Guilford extension, and also to Roland Avenue to close tie line switch with Roland Park section. This will make Boulevard section alive. The driver will then meet the lineman at Greenmount Avenue and B. & O. right-of-way, where cables Nos. 154 and 155 are to be opened and tested with test lamp.

If Nos. 154 and 155 Test Clear:

CABLES Nos. 106 AND 107—Go to Exeter Hall Avenue and open switches on cables Nos. 106 and 107 and have operator at Northern substation test these cables, after which close in on clear cable, notifying operator to do the same. Then close tie line switch between Boulevard, Roland Park and St. Paul Street section at Exeter Hall Avenue. Then go to York Road and B. & O. right-of-way and Greenmount Avenue and 31st Street and close switches on cables Nos. 154 and 155. Then test cable No 154-A and if clear, close switches on it.

Then go to Roland Avenue and open tie line switch with Roland Park section.

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American Association News

Claims and T. & T. Committees for 1925

THE committee appointments of the Claims Association and of the Transportation and Traffic Association for the current year have now all been made. Invitations have been sent out to the members given in the following list, and acceptances have been received from all but a few of those named. An additional committee on engineering symbols which has been appointed in the Engineering Association is also included below.

It is expected that committee appointments in the Accountants' Association, as well as additional American Association committees, will be announced in the near future.

Claims Association

ACCIDENT PREVENTION

(Joint Committee with T. & T. Association)

C. B. Hardin, general claim agent United Railways of St. Louis, St. Louis, Mo., co-chairman.
J. H. Handlon, San Francisco, Cal.
S. G. Shaw, Denver, Col.
H. H. Barnard, Birmingham, Ala.
J. S. Harrison, Jacksonville, Fla.
L. F. Wynne, Atlanta, Ga.
G. R. Whitmore, Peoria, Ill.
T. C. Neilson, East St. Louis, Ill.
Wallace Muir, Lexington, Ky.
J. G. Bruce, Indianapolis, Ind.
E. J. Paige, Baltimore, Md.
W. H. Hyland, Gloverville, N. Y.
C. W. Giltner, Detroit, Mich.
H. E. Cady, Utica, N. Y.
R. A. Sears, Boston, Mass.
Samuel Riddle, Louisville, Ky.

EMPLOYMENT

W. G. Marshall, superintendent claim department, Pittsburgh Railway, Pittsburgh, Pa., chairman.
Neil Funk, Louisville, Ky.
C. M. Roberts, Los Angeles, Cal.
H. L. Osgood, Springfield, Mass.
A. E. Shaw, Montreal, Canada.

MEDICAL AND SURGICAL WORK

F. L. Mosser, surgeon Third Avenue Railway, New York, N. Y., chairman.
George Lorenz, Chicago, Ill.
E. W. Miller, Milwaukee, Wis.
Daniel Strock, Newark, N. J.
J. A. Watts, San Antonio, Tex.

RESOLUTIONS

William Tichenor, claim agent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., chairman.
D. M. Finch, Des Moines, Ia.
A. G. Jack, Wilmington, Del.
A. F. Solms, Savannah, Ga.

SUBJECTS

J. J. Reynolds, claims attorney Boston Elevated Railway, Boston, Mass., chairman.
S. A. Bishop, Los Angeles, Cal.
W. H. Hyland, Gloversville, N. Y.
F. S. Macy, Brooklyn, N. Y.
Wallace Muir, Lexington, Ky.
E. J. Paige, Baltimore, Md.
C. E. Redfern, Providence, R. I

Transportation and Traffic Association

ACCIDENT PREVENTION

(Joint Committee with Claims Association)

C. W. Chase, president Gary Street Railway, Gary, Ind., co-chairman.
M. W. Bridges, Chicago, Ill.
J. F. Egolf, Aurora, Ill.
Arthur Gaboury, Montreal, Canada.
J. A. Jarvis, Chicago, Ill.
A. W. Koehler, Rochester, N. Y.
R. L. Lindsey, Durham, N. C.
G. H. McFee, Framingham, Mass.
A. B. Miles, St. George, S. I., N. Y.
R. M. Reade, Quebec, Canada.
C. F. Schmidt, Indianapolis, Ind.
R. J. Smith, Davenport, Iowa.
Samuel Riddle, Louisville, Ky.
George Theis, Jr., Wichita, Kan.

BUS OPERATION

A. H. Ferrandou, executive assistant Washington Railway & Electric Company, Washington, D. C., chairman.
B. W. Arnold, Milwaukee, Wis.
D. C. Barnes, Boston, Mass.
C. H. Chapman, Waterbury, Conn.
F. A. Cummings, Boston, Mass.
E. D. Dreyfus, Pittsburgh, Pa.
M. L. Harry, Decatur, Ill.
D. J. Locke, Newark, N. J.
J. W. McCloy, Syracuse, N. Y.
H. A. Mullett, Milwaukee, Wis.
D. A. Scanlon, Akron, Ohio.
O. A. Smith, Los Angeles, Cal.
R. H. Smith, New York, N. Y.
J. B. Stewart, Jr., Youngstown, Ohio.
J. V. Sullivan, Chicago, Ill.

SELLING TRANSPORTATION

W. E. Wood, local manager Houston Electric Company, Houston, Tex., chairman.
W. M. Bird, Paducah, Ky.
J. R. Blackhall, Joliet, Ill.
J. A. Dewhurst, Philadelphia, Pa.
H. Etheridge, Harmony, Pa.
C. A. Graves, Olean, N. Y.
J. P. Griffin, Dallas, Tex.
C. F. Handshy, Springfield, I'l.
W. W. Holden, San Antonio, Tex.
H. G. Monger, Milwaukee, Wis.
C. D. Smith, New Brighton, Pa.
Bert Weedon, Indianapolis, Ind.
E. S. Wilde, New Bedford, Mass.
W. H. Boyce, Pittsburgh, Pa.

TRAFFIC CONGESTION

G. B. Anderson, manager of transportation Los Angeles Railway, Los Angeles, Cal., chairman.
W. E. Thompson, superintendent of transportation Third Avenue Railway, New York, N. Y., vice-chairman.
W. S. Bell, Wilkes-Barre, Pa.
R. C. Brooks, Savannah, Ga.
S. C. Dows, Cedar Rapids, Ia.
D. L. Fennell, Kansas City, Mo.
J. A. Greig, Chicago, Ill.
J. E. Heberle, Washington, D. C.
F. R. Latta, Syracuse, N. Y.
W. H. Maltbie, Baltimore, Md.
A. R. Myers, Erie, Pa.
J. P. Pope, Lexington, Ky.
E. S. Rider, Detroit, Mich.
J. P. Tretton, Indianapolis, Ind.
P. E. Wilson, Cleveland, Ohio.

Engineering Association

ENGINEERING SYMBOLS

H. R. Stamm, architect the Connecticut Company, New Haven, Conn., chairman.
H. W. Codding, Newark, N. J.
R. C. Cram, Brooklyn, N. Y.
E. L. Lockman, Boston, Mass.
J. F. Neild, Toronto, Canada.
C. W. Squier, New York, N. Y.

Executive Committee

THE executive committee of the American Electric Railway Association met in regular meeting in New York on Jan. 7. Members present were President J. N. Shannahan, Secretary J. W. Welsh, R. P. Stevens, C. E. Morgan, W. H. Sawyer, J. H. Hanna, T. C. Cherry, J. P. Barnes, C. H. Clark, C. S. Hawley, E. P. Waller, A. A. Hale, E. F. Wickwire and M. B. Lambert.

Reports were heard from the various standing committees. Approval was given the work done by a special committee in engaging new headquarters for the association beginning May. 1.

Speaking for the committee on publicity, Mr. Barnes urged that the members of the association and the association itself give thorough co-operation in following up the work of the National Conference on Street and Highway Safety, which was called by Mr. Hoover. Mr. Barnes also gave a brief report of the activities of this conference and expressed the view that it had resulted in the most instructive and conclusive statement for guidance in the street and highway traffic situation that has ever been compiled. He thought that this conference had started a humanitarian and altruistic movement of great importance. The statement referred to was presented in ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, 1924, page 1042, together with editorial comment pointing out certain aspects of the work done by the conference, page 1021.

A set of principles drawn tentatively by the committee on co-operation with the motor vehicle industry to express the policies of the American Electric Railway Association with respect to the bus was read to the executive commit-

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tee but no action taken at this meeting. The committee also discussed at some length the need for legislation to bring interstate operation of motor bus lines under the jurisdiction of the Interstate Commerce Commission. No definite step was taken, the object being merely to get an expression of view in respect to this problem. There was unanimity of opinion that the Interstate Commerce Commission should be given jurisdiction over such common carrier operation.

President Shannahan read a report of the Coffin prize committee in which suggestions had been made to the Coffin Foundation for extending somewhat the basis of award. A communication from the Foundation stated several reasons why it was deemed undesirable to make any changes in the plan this year.

The next meeting of the committee will be held in Washington on Monday, Feb. 16, at 10 a.m., in the United States Chamber of Commerce building.

Way Committee

A GENERAL outline of the work to be undertaken by the various subcommittees was considered at a meeting of the way committee, in New York, on Dec. 18-19. Among the subjects of interest discussed was the question of substitute ties. The committee suggested that the sub-committee analyze the results of last year's questionnaire, and follow up the various member companies and manufacturers who are in a position to furnish data. It was the consensus of opinion that the sub-committee should endeavor to design a suitable substitute tie for track in paved streets. Later a design of tie for open track construction can be studied. Considerable discussion took place concerning ways to reduce the noise of car operation. It was thought that the greater part of the noise could be attributed to the condition of the cars. Comparative noise of operation over monolithic steel tie track structure and other forms of ballasted track will be investigated.

During the discussion of welded rail joints, C. H. Clark, president of the American Electric Railway Engineering Association, who was present at the meeting, outlined the results of a visit to Washington, and said that the repeated impact testing machine was now running about 17 hours a day, and striking about 3,600 blows per hour. It drops a 400-lb. weight 6 in. on the joint. R. H. Dalgleish added that arrangements had been made to install a so-called "telemeter" on the lines of the Washington Railway & Electric Company to obtain data on the actual impact of car wheels. The committee asked the chairman to request the chairman of the committee on welded rail joints to resume the distribution of the monthly bulletin to members of the way committee.

C. H. Clark outlined his views on the organization of the special committee which he will appoint in the near future to make an exhaustive personal study of the subject of rail corrugation. The members of this committee will visit several of the larger railways in this country and report their conclusions.

One of the most important problems requiring solution in connection with the question of surface hardening of rails is the matter of accurately determining the amount of wear. Several members made suggestions and expressed their views on the subject, and a number also offered to furnish instruments which they had used for this purpose. The next step of the subcommittee will be to determine the relative wear on treated and untreated rails.

Review of existing standards, standardization of frogs and switches, crossing designs, welding methods, welding wire, and the allowable limit of wear were other subjects considered. Those present were: H. H. George, chairman; C. A. Alden, V. Angerer, H. H. Dartt, W. R. Dunham, Jr., E. B. Entwisle, T. A. Ferneding, R. B. Fisher, Chester F. Gailor, Fred Glenton, Jr., D. J. Graham, H. C. Heaton, Norman M. Hench, M. M. Johnston, Thomas J. Lavan, E. L. Lockman, H. F. Merker, L. A. Mitchell, O. C. Rehfuss, E. M. T. Ryder, A. T. Spencer, J. B. Tinnon, W. W. Wysor, R. H. Dalgleish, sponsor.

Special Reports Available

THE following special reports have been prepared by the Bureau of Information and Service of the American Electric Railway Association and are available to member companies in good standing upon request. Beginning with the new year the bulletins, reports, compilations, etc., will be numbered in the order in which they are issued. This, it is believed, will make ordering easier.

Bulletin No. 1—Electric Railways Operating Motor Bus Lines: Revision of the compilation of Aug. 1, 1924, bringing up to date data on the number of routes and buses operated, type of bus and seating capacity, fare charged and transfer privileges, etc. There are approximately 180 companies included in the present list.

Bulletin No. 2—Trend of Electric Railway Operations: A month-by-month record of the traffic, revenues, expenses, taxes, car-miles, operating ratio, etc., of a group of 80 companies since Jan. 1, 1920. This is a new edition of the compilation of Aug. 1, 1924, bringing the record of operations of this group of 80 companies down through October, 1924.

Bulletin No. 3—Motor Bus Operations in the United States, Part II: This is a second installment of a list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operators and where the information is available, statistical data on the character of their operations. The present installment covers the states of Iowa, Washington and West Virginia.

Bulletin No. 4—Trend of Material Prices: New edition of the association's compilation bringing down to date the trend of prices of materials used by electric railways furnished by manufacturers.

In addition to the above, supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies have been prepared, bringing them down to date.

Arrangements for Mid-Year Dinner

THE American Electric Railway Association is sending out descriptive material and a tentative program for the Mid-Year Meeting and Dinner which will be held in Washington, Feb. 15 and 16. Blanks are inclosed for reservations for the dinner and allotments will be made in the order in which requests are received.

Monday will be devoted to committee meetings, between 15 and 20 committees having made arrangements to meet that day.

The morning and afternoon sessions on Tuesday will be held in the Chamber of Commerce Building, H Street and Connecticut Avenue. They will be in the form of a town meeting or open forum with free discussion by all interests represented. The morning topic will be "What Are the Facts About Electric Railway Service." The discussion will be led from the standpoint of the outsider by Peter Witt of Cleveland, Ohio, and from the standpoint of the manufacturer by J. G. Barry of Schenectady, N. Y. The subject for the afternoon session will be "Motorbuses—When, Where and How They Should be Used by Electric Railways." S. B. Way of Milwaukee will lead the discussion from the electric railway standpoint, while a representative of the National Automobile Chamber of Commerce will present the viewpoint of the motor bus operator.

The dinner will be held at the New Willard Hotel. Addresses will be given by national speakers in the government service at Washington as well as by leading men of the electric railway industry.

Washington offers many attractions peculiar to itself. With this in mind the committee of arrangements is planning a special program that will be of interest to the ladies who are in attendance.

News of Other Associations

A.E.S.C. Elects Officers

AT THE annual meeting of the American Engineering Standards Committee on Dec. 11 Charles E. Skinner, assistant director of engineering Westinghouse Electric & Manufacturing Company, a representative of the American Institute of Electrical Engineers, was elected chairman for the year 1925, and Charles Rufus Harte, construction engineer the Connecticut Company, representative of the American Electric Railway Association, was elected vice-chairman.

Southern Equipment Men Will Meet

The Electric Railway Association of Equipment Men, Southern Properties, will hold its annual meeting in Dallas, Tex., Jan. 21, 22 and 23.

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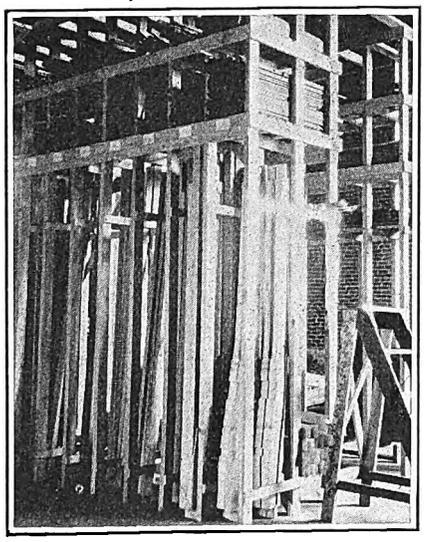
Maintenance of Equipment

Millwork Stored in Racks

SIDE posts, belt rails, arm rests and other car replacement parts made in the shop mill room are stored in racks located in a room adjacent to the mill room by the Columbus Railway, Power & Light Company. These racks are made up of waste, or otherwise worthless lumber.

The uprights are 3½ in. x 1¼ in. and are approximately 8 ft. long. The cross-members are odd-sized



In Columbus, Ohio, Millwork Is Stored in Racks Where It Is Readily Available for Car Repairs

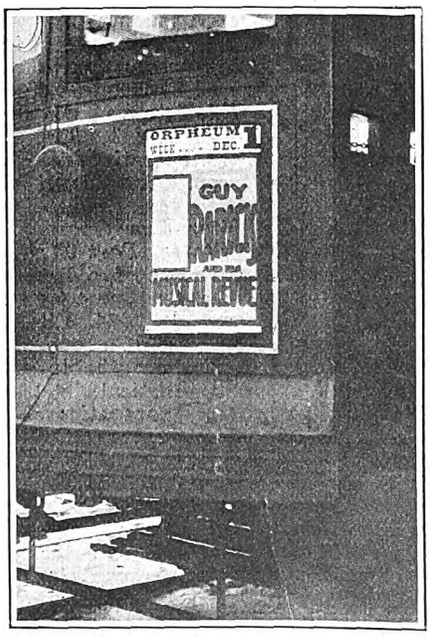
pieces approximately ½ in. x 1½ in., while the diagonal braces at the center of the framework are lighter strips. The racks are 30 in. deep and about 10 ft. long. The lower openings of the rack are of sufficient height to accommodate car side posts vertically. Above these spaces are two tiers of small openings approximately 1 ft. square which hold short lengths of interior trim. Long pieces of molding and beading are stored the long way of the racks.

On the front of the rack just above the openings are labels which identify the contents. As this material is not under the jurisdiction of the stores department, a carpenter may take any part needed from the rack without giving a requisition for it.

Similar racks are used for storing sash, doors, and other small made-up millwork. With these storage facilities, it is possible to utilize the wood-working machines to the best advantage, as a large quantity of any one particular piece may be made up at a time. With an ample supply of millwork replacement parts a car may be put through the shops in less time than when making individual parts.

Cheap Dasher Card Racks

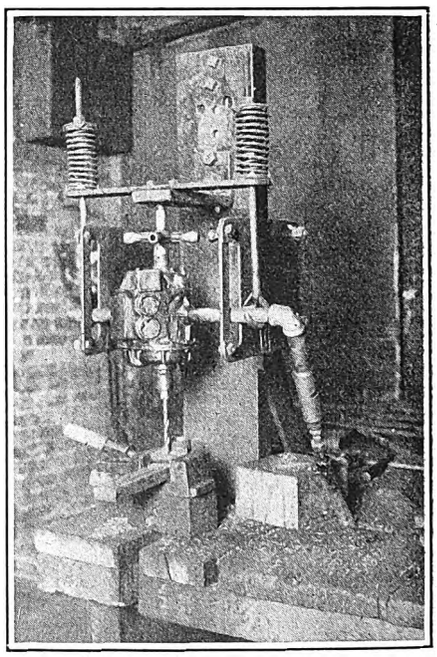
STEEL strips bolted fast to the dashers have been installed by the Altoona & Logan Valley Electric Railway, Altoona, Pa., to hold display cards. These strips are slightly raised from the face of the dasher and the card is slipped in at the bottom. After it has been pushed all the way up it is allowed to drop back a fraction of an inch into the lower support. Previous to the installation of these racks advertising and other cards were carried on wooden boards suspended from hangers on the dashers. The earlier practice was rather unsightly and the swinging of the boards when the car was in motion had a tendency to deface the paint. The new rack costs only $2.25 to install. This is not appreciably more than the cost of the old boards.



This Neat Card Rack Costs But Little More to Install Than the Unsightly Wooden Dasher Sign Which It Has Replaced

Using a Portable Drill as a Drill Press

A SET-UP using a Chicago Pneumatic Tool Company's drill for work ordinarily done on a drill press has proved a great time saver at the 39th Street shops of the New York Rapid Transit Corporation, Brooklyn, N. Y. It has been used principally in



With This Supporting Arrangement a Pneumatic Drill Is Used for Drilling Small Parts on the Work Bench

connection with some work which required finishing operations at the bench. In the ordinary procedure the workman would be required to walk a considerable distance to the nearest drill press for the drilling operation. By setting up this pneumatic tool on the bench the workman could do the entire job without unnecessary walking and waste of time.

The vertical support for the pneumatic drill consists of a 10-in. channel, as shown in the illustration. A bracket is bolted to this with a crossarm which has two supporting springs. Hooked rods passing through these springs with washers and caps at the top keep the drill firmly in contact with the supporting bracket. The flexible hose connection allows vertical movement of the drill so that it can be fed into the work by the hand screw in the ordinary manner.

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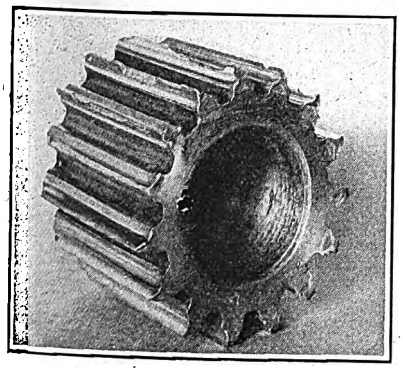
Provision for the vertical motion is made by two slotted guides bolted to the channel on either side, and which hold in position the handles of the drill, to one of which the air supply passes.

Pinion Failure Traced to Worn Axle and Housings

THE ACCOMPANYING illustration shows a pinion which was one of several being tested in service by the Worcester Consolidated Street Railway. Inspection was made and measurements were taken of each pinion approximately every 20,000 miles. The pinion shown in the illustration was inspected at the end of 24,154, 41,288 and 56,682 miles and had very little wear up to the last inspection, when it was found to be ruined. Referring back to the time of the previous inspection showed that the interval was exactly 15,394 miles. An investigation was begun to determine the cause for this pinion breaking down in service, when it previously had shown up so well. The axle and axle bearing housing of the motor on which this pinion was installed were



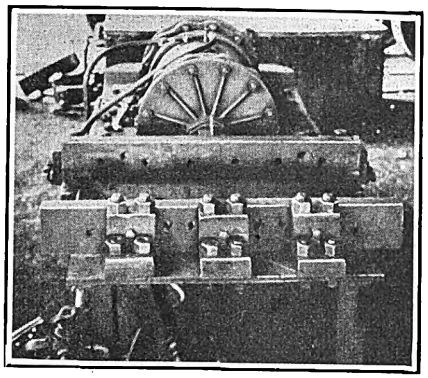
The Ends of the Pinion Teeth Were Destroyed as a Result of Worn Axle Bearing Housing

found worn considerably but the bearings themselves showed very little wear. This housing and axle wear had allowed the gear and pinion centers to separate so that sufficient pressure was exerted at the ends of the teeth to cause the pinion to wear excessively at this point and ultimately break.

Air Operated Bulldozer

By J. L. Rogers
Forge Shop Foreman Kansas City Railways

A HANDY, home-made outfit that has proved very useful on many kinds of work in the forge shop of the Kansas City Railways is the pneumatic bulldozer shown in the accompanying illustration. This machine was built in the forge shop some years ago and has saved its cost many times over by reducing the time required for various small forming jobs.



A Simple Pneumatic Bulldozer Built in the Shops of the Kansas City Railways Has Proved to Be a Very Efficient Shop Tool

The bulldozer is used for forming all small angle plates, wear plates, and similar truck parts, and also for truing up light castings. The illustration shows the stationary back bar which is bolted to the frame of the machine, and also the movable bar which is fastened to the piston, and to which are bolted the various dies and forming tools that have been developed for use with the machine.

The air cylinder has a bore of 16½ in. and a stroke of 24 in. It develops a pressure of 21,000 lb., when air at a pressure of 100 lb. per square inch is admitted. The piping is arranged with a double-action valve so as to develop pressure on the piston for movement in either direction.

Handy Tank for Heating and Cleaning Pinions

A SIMPLE type of hot water heater is found handy in the shops of the Twin City Rapid Transit Company, Minneapolis, Minn. This is used for preheating pinions before they are placed on the armature shafts. A circular steel tank, steam jacketed, has a capacity of 60 gal. of water. By the admission of low pressure steam to the jacket this is kept at a temperature close to the boiling point.

This tank is useful for another purpose. In many cases pinions are removed from armatures for various reasons before they are worn out. They are usually very greasy and disagreeable and hard to handle. To put them in condition for handling in the shop until they are put back in service soda ash is added to the hot water in the tank and the greasy pinions are readily cleaned by immersion in the solution.

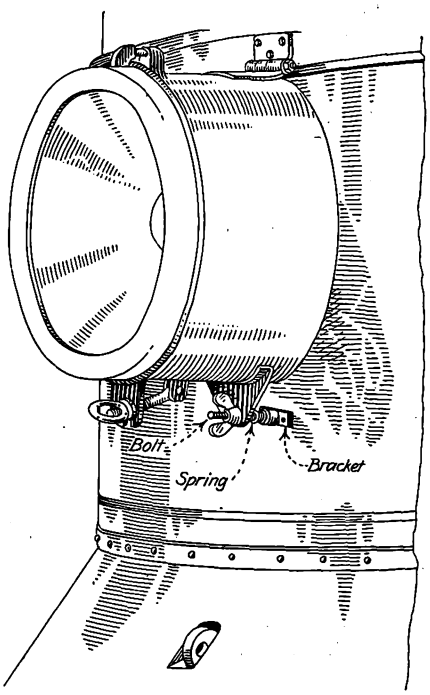
A sheet metal hood conducts steam and other vapors to a ventilating flue, thus preventing them from spreading into the shop.

Causes of Pull-Ins

REPORTS compiled by the Electric Railway Association of Equipment Men, Southern Properties, for the first 11 months of the year just ended show that more pull-ins were caused by defective armatures than by any other one thing. On the nine railways furnishing figures for the entire period pull-ins from this cause numbered 597. Air brakes were responsible for 515, controllers 338, brake rigging 318 and defective field coils 300. While the total number of pull-ins for other reasons was large, no one cause was as important as those listed above.

Adjustable Headlight Mounting

HEADLIGHTS on the suburban and interurban cars of the Gary Street Railway, Gary, Ind., are mounted on the dash in such a manner that they may be tilted. This



Adjustable Mounting of Headlights on Suburban Cars of Gary Street Railway Allows Beam of Light to Be Directed Toward the Proper Point Ahead of Car

permits the motorman to direct the ray of light to the proper point ahead of the car. The headlight is fastened at the top to a hinge and is

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held at the bottom by a bolt with winged nut. This lower fastening is adjustable. It is used to tilt the headlight up or down about the hinged support at the top.

An ordinary flat iron hinge, approximately 4 in. wide, is bolted to the vestibule belt rail and to the top of the RM-12 Golden Glow headlight. The flange for mounting the headlight in a recess in the dash is removed. A short piece of angle section is riveted to the bottom of the headlight casing. A hole in the projecting lip of this flange piece receives a ½-in. bolt which is held in a small bracket attached to the dash. An automobile valve spring placed on the bolt between the headlight flange and a washer at the bracket keeps the headlight flange against a winged nut on the end of the bolt. The spring serves to hold the headlight in position after adjustment is made by the nut.

Before taking the car out, the motorman adjusts the position of the headlight so that the beam of light strikes the ground at the proper point ahead of the car. This adjustment is made so that the light is not thrown up into the air, temporarily blinding motorists or pedestrians alongside the right-of-way.

New Equipment Available

Drive Screws for Permanent Fastening

FOR attaching nameplates or making permanent assembly, where screws once inserted are not removed frequently, the Parker-Kalon Corporation, New York, N. Y., has brought out a hardened metallic drive screw which cuts its own thread in the material as it is hammered in. Such a type of screw is cheaper to install because the cost of tapping is saved and less time is required to make the fastening. An accompanying illustration shows the construction.

Hardened Metallic Drive Screw

Travel Carriage for Arc Welding

IN ORDER to simplify the work of building up worn flat surfaces by the arc-welding method, a travel carriage has been developed for automatic welding of straight seams by the General Electric Company, Schenectady, N. Y. This carriage is a self-contained unit and includes an automatic welding head, the necessary control, a travel motor and a wire reel. The welding head and control are mounted on the apron of the carriage, so as to feed the electrode wire from the reel to the arc.

In operation the travel carriage is controlled electrically by means of push buttons. The control of the welding head and travel of the motor are so interlocked that when the starting button is pushed, the arc is automatically established simultaneously with the starting of the travel motor. Should the arc fail for any reason, the travel motor will stop without overtravel. When the arc is re-established, the travel motor will restart without attention from the operator. The equipment is approximately 3 ft. 6 in. long, 2 ft. 7 in. wide, and 2 ft. 6 in. high, and has a weight of 800 lb.

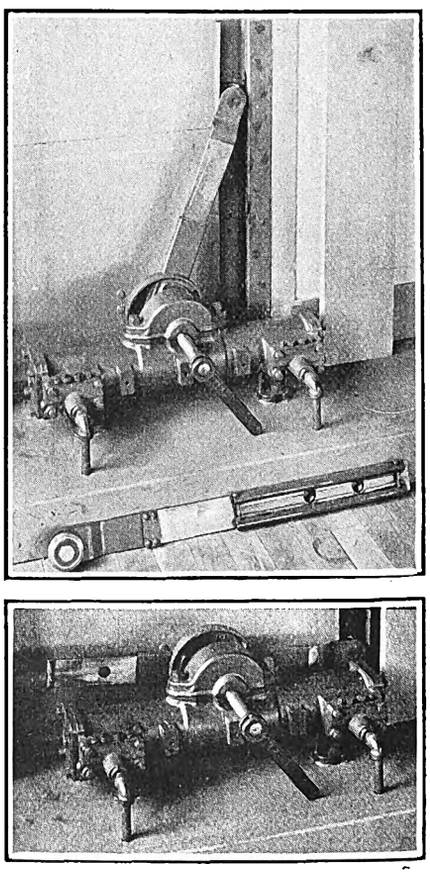
Shockproof Circuit Breaker

DOUBLE-POLE, interlocked-trip and shockproof circuit breakers are new types being placed on the market by the Roller-Smith Company, New York, N. Y. The interlocked-trip breaker is so arranged that the two poles are closed independently and successively. In case of an overload the pole first closed will open as soon as the second pole is closed. Should an overload occur after both poles are closed they will open simultaneously. This type of breaker is intended for use largely on motors and feeder circuits in place of switches and fuses.

Shockproof circuit breakers are intended for operation under conditions of excessive vibration or so subject to mechanical shock as to cause undesirable openings. Any listed standard type circuit breaker can be supplied with shockproof attachment to meet any requirements. It is said that the addition of this attachment does not materially alter the appearance, size or method of operation of the circuit breaker.

Collapsible Arm for Door Engines

AN IMPROVED type of collapsible arm for the engines which operate sliding type car doors has been brought out by the Consolidated Car Heating Company, Albany, N. Y. The arm is made in two parts. The one fastened to the operating shaft of the door engine is made of pressed steel and forms a housing for the other part of the arm to slide in. This housing contains two springs about 10 in. long, which keep the arm in its extended position. Should a passenger be caught by the door, it can be pushed back readily so as to provide for his release up to the time when the door is entirely closed. Another improvement in the construction of this arm is the use of a hardened steel roller with ball bearings, which runs in the pressed steel track on the door with no possibility of binding. This construction is the same as that used on the sheaves for door hangers furnished by the company and provides interchangeability.



Door Engine Fitted with Collapsible Arm
Above, arm in extended position. Below, arm forced back to provide door opening.

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The News of the Industry

$50,000,000 Project

Reported Electrification Plan of Pennsylvania Railroad Comprises More than 220 Miles

The Pennsylvania Railroad will electrify its lines between New York and Washington in the near future, according to a report published in New York and Philadelphia newspapers. This involves one of the heaviest four-track trunk line systems in the world, about 220 miles in length. Estimates of the cost of the work are said to be upward of $50,000,000. Short portions of the route from the Pennsylvania Station in New York City to Manhattan Transfer, New Jersey, and in the vicinity of Philadelphia already are operating electrically, the former on the third rail system at 600 volts direct current and the latter on an overhead trolley at 11,000 volts, single-phase. The plan of electrification will be to use the 11,000-volt system throughout. In connection with the New York, New Haven & Hartford Railroad, which operates with electric power on the 11,000-volt alternating current system between New York and New Haven, this would be a continuous electrified line of some 300 miles.

No power plants are included in the construction program, it is said. Power is to be purchased from several of the utility companies along the line, such as the Public Service Electric & Gas Company, the Philadelphia Electric Company and its subsidiary, the Susquehanna Power Company, and the Consolidated Gas, Electric Light & Power Company of Baltimore.

No confirmation could be obtained of the reports up to the time this paper went to press. Undoubtedly, a program so extensive as this would have to be carried out in a piecemeal fashion, inasmuch as it would take several years to complete the entire project. It is possible that the first section to be converted would be that from Philadelphia to Wilmington, which has been mentioned several times as the next electrification to be undertaken by the Pennsylvania Railroad.

Flat 6-Cent Fare in Duluth

Under an order issued by Federal Judge Wilbur F. Booth, sitting at St. Paul, Minn., the Duluth Street Railway, Duluth, Minn., is entitled to charge a straight 6-cent fare. Judge Booth's order affirms the findings of Judge T. D. O'Brien, special master, to the effect that any fare under 6 cents would not provide a fair rate of return on the valuation of the company's property. On July 13, 1922, the State Railroad & Warehouse Commission filed an order granting the Duluth Street Railway the right to charge a flat rate of 6 cents for single fares and to sell coupons at the rate of five rides for a quarter. From this order the company appealed to the federal court, and as a result of a hearing before a special master the flat 6-cent rate was ordered.

Pending appeal the company issued coupons bearing five tickets which sold for 30 cents. The stub of the tickets constituted a coupon redeemable by the company for 5 cents if the Railroad & Warehouse Commission rate of five rides for a quarter were sustained. The coupon, however, will be void unless upon appeal to the United States Supreme Court the city secures a reversal of the order for a flat 6-cent rate.

The City Council is now considering the matter of an appeal, but no action has yet been taken.

Interstate Commission Controls Rates of Interstate Interurbans

Supreme Court Distinguishes Between Urban and Interurban Railways and Places the Rates of the Latter Under Federal Regulations —Justice McReynolds Dissents

A DECISION of the federal court for the Northern District of Ohio has been reversed by the United States Supreme Court. In an opinion rendered on Jan. 5 the Supreme Court declared that the Interstate Commerce Commission has authority to regulate passenger rates on an interstate electric interurban railway regardless of whether it is part of a general steam railway system. Laying down this principle, the court did not feel it necessary to pass upon the point of whether the electric carriers involved were engaged in a general freight business, which was another question raised in the original suits. The court quoted various passages of the Interstate Commission acts of 1887 and 1910 to show that all common carriers by railroad were included in their provisions, pointed out that the federal employers' liability act and the safety appliance act had been applied to interurban electric railways and that in the transportation act of 1920 certain classes of electric railways were excluded only by express mention. The court also referred to the Omaha & Council Bluffs Street Railway case (230 U. S., 324, 327) and said that the distinction in that case, in which the commission did not have rate jurisdiction over an interstate line because it was purely an urban system, had been carefully observed in the present case. Justice Brandeis rendered the decision of the court. Justice McReynolds dissented.

The two cases under consideration were parallel in principle and were decided in the single opinion rendered. Both cases were appeals by the United States for the Interstate Commerce Commission and the electric railways involved from adverse decisions in the local district court. One case involved the village of Hubbard, Ohio, and the Pennsylvania-Ohio Power & Light Company and the other involved the city of Wellsville, Ohio, and the Steubenville, East Liverpool & Beaver Valley Traction Company.

In both cases the Interstate Commerce Commission had assumed jurisdiction and ordered the electric railways to increase intrastate passenger fares within Ohio so as to remove discriminations against interstate passenger fares between Ohio and Pennsylvania points. The fares within the Ohio municipalities were not disturbed, but the increased intrastate rates came in conflict with ordinances of Hubbard and Wellsville and suits were brought by these communities to test the authority of the I.C.C.

The District Court held with the Ohio communities that as the electric railways involved were neither parts of general steam railways nor generally engaged in carrying freight, they were excluded from the jurisdiction of the Interstate Commerce Commission. From these decisions, the government, with the railways, appealed.

In his dissenting opinion, Justice McReynolds asserts that nowhere has he found an expression by Congress to disregard the limitations of the commission's authority over electric lines laid down by the court in 1913 and that "the states can and should control until and unless Congress, by clear language, shall indicate the intent to regulate."

Wisconsin Commission Rules It Cannot Authorize Abandonment

Ruling that it could not authorize the abandonment of a railway franchise unless the consent of the City Council had first been given, the Wisconsin Railroad Commission dismissed the petition of the Janesville Traction Company to discontinue service on its Washington Street line. In its findings the commission said that it was apparent that the applicant could not indefinitely furnish service at a financial loss, that the city must grant substantial concessions in this form of relief from paving obligations or that there must be a considerable increase in patronage.

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Further Interurban and Bus Co-ordination in Missouri

Decisive action in co-ordinating interurban bus and electric railway transportation has been taken by the Kansas City, Clay County & St. Joseph Railway. The Missouri Public Service Commission recently granted the company the right to reduce its train schedules, and on Dec. 31 the company installed two more Blue Bus service routes. Train schedules on the electric railway will be altered.

On the Excelsior Springs division rush hour trains will run as before. Mid-day trains will run one and one half hours apart, instead of one hour. Running time between Kansas City and the Springs will be reduced 6 minutes on all trains. A new train will leave Kansas City at 10:30 at night to meet the demand of picture show crowds, which develop earlier than those from the theaters.

On the St. Joseph division the only trains that will be taken off are locals that ran on the same time as the limiteds. The limiteds will stop on flag at the three towns en route, Ferrelview, Camden Point and Dearborn. All local trains on the St. Joseph division will be speeded up.

Operating its "Blue Car" de luxe safety coaches, already on hourly schedule between Kansas City and Excelsior Springs, the Kansas City, Clay County & St. Joseph Auto Transit Company at this time protects itself as far north as Trimble, Mo., where the fare is $1. Nearing Kansas City fares from the other towns served are: Smithville, 75 cents; Nashua, 55 cents; Gashland, 40 cents; Linden, 30 cents; Templeton, 25 cents; North Kansas City, 20 cents. Three round trips are made as far as Smithville, and two from there to Trimble. It is the intent of the railway to extend the bus line to St. Joseph as soon as the paved road is completed.

Robert P. Woods, president of the companies controlling both bus and electric line, says: "We believe in the interurban business."

"Blue Line" de luxe safety coaches are to be used on all routes.

What the Railway Does

Advertising matter pointing out the place in the community enjoyed by the electric railway industry is being issued by the Chicago Surface Lines. The advertising is addressed to heads of industries and mentions the Chicago lines only incidentally, aside from the signature of Henry A. Blair, president of the Surface Lines. Under the heading "Street Car and Factory," Mr. Blair says:

As an individual you have a civic interest in good street car service.

As a manufacturer you have a financial interest in the proper solution of the problems of street car operation.

Efficient local transportation is essential to orderly industry and street cars provide the only satisfactory and dependable mass transportation.

Street railways contribute directly toward industrial prosperity, for a surprisingly wide variety of materials are used in their construction, equipment and operation. These materials are always bought near home.

And the payroll of the street car system is no insignificant item in the community budget. The Chicago Surface Lines, for instance, pays out in wages a total of $30,000,000 a year, all of it disbursed in the district served by the system.

It is to the interest of every citizen to see that street railways are given a fair chance to render efficient service.

More than this they do not ask.

Detroit Commission Balks

Refuses to Approve Contract to Standard Company for Buses—Change in Authority Contemplated

After voting at its last 1924 meeting to award a contract for furnishing the Detroit Department of Street Railways with 50 double-deck buses, the City Council has been blocked in its action by the Street Railway Commission. On its part, the department has refused to sign the contract for the purchase of the buses from the Standard Motor Truck Company, Detroit. In consequence it appears likely that a charter amendment will be submitted to the voters in the spring providing for a return to the original status under which the City Council will have no control over contracts awarded by the Street Railway Commission.

Notwithstanding the recommendation of the department that the contract for 50 buses be awarded to the Yellow Coach Manufacturing Company, Chicago, which has both built and operated buses, the City Council voted to award the contract to the local company which has never built any buses. Information from Ross Schram, manager of the railway, that the commission would not sign the contract led the Council to consider giving the voters a chance to decide the issue, in the way of a charter amendment. Such a charter amendment if passed will put the Department of Street Railways entirely under the control of the Mayor and the Street Railway Commission or in the same status that it was originally when the municipal system was started by former Mayor James Couzens. The commission believes it was a mistake to add a clause giving the Council the right to approve contracts for the street railway.

About four months ago the first bids were asked for furnishing buses to supply transportation in the unserved outskirts of the city. About three years previously the D. S. R. had been authorized to buy trackless trolleys or buses. An amendment to the charter approved about the same time removed the duty of buying equipment for the D. S. R. from the Department of Purchases and Supplies, but the contracts according to the amendment, are subject to the approval of the City Council.

After certain trials, it was decided by the commission that the trackless trolleys were not fully satisfactory for use in the intended service. Later Mr. Couzens, then Mayor, authorized the purchase of one single-deck bus. After further study William B. Mayo, chief engineer of the Ford Motor Company and at that time general manager of the D. S. R., recommended double-deck buses and specifications were drawn up by the commission's engineers, which left the way open for various companies to bid.

When the first bids were opened on Sept. 9, 1924, proposals were submitted by two motor truck companies in Detroit and by two bus manufacturers with factories located in other cities. It was decided to reject all bids. When new bids were opened on Sept. 29, they were lower than the original ones. In opposition to the recommendat of the Street Railway Commission, the Council on Nov. 15, meeting in committee, voted to award the contract for 50 buses to the Standard Motor Truck Company, Detroit, the lowest bidder. The matter was reopened when Ross Schram, general manager, questioned the decision that the Standard Company was low bidder on the grounds that it bid on a type of bus differing in several respects from the specifications.

While awaiting final decision as to the purchase of the double-deck buses, the renting of 25 single-deck buses was authorized and these buses are being put into operation as rapidly as they are delivered by Dodge Brothers Motor Car Company. The city pays a rental of 29 cents per bus mile of operation and reserves the right to purchase the buses, the rental paid to apply on the purchase price. An account of this new service is given in another column.

When Mayor John W. Smith on Dec. 1 suggested the purchase of five buses from the two local bus companies and from the Yellow Coach Manufacturing Company, the Council directed the Street Railway Commission to take the matter up with the three companies. An order for five buses was refused by the Standard Company. The vote in the Council awarding the entire 50 buses to the Standard Company followed. Later this move was blocked by the commission's refusal to sign the contract.

The Council has approved the request of the general manager of the D. S. R. to rent 25 additional Dodge single-deck buses and early deliveries were urged because of the great demand for bus transportation. One line has already been put into operation, the first trip being made over the Mack line on New Year's day, with eight buses in operation. The number is to be increased as the vehicles are delivered to the commission.

Providence Still Negotiating New Labor Agreement

Negotiations for a new working agreement or for arbitration are still in progress in Providence, R. I., between the officials of the United Electric Railways and the union employees. Although the men have recently taken a vote in favor of suspending work, their act did not necessarily mean that they would strike. This phase of the matter was stressed by Delegate Coleman, who stated that negotiations with the company were still under way, but that union officials did not propose to allow the conference to drag on.

The contract with the men expired Oct. 31. Prior to that date the men submitted demands calling for an increase of 14 cents. The present scale is 56, 59 and 61 cents. In addition to the disagreement over the wage scale the labor and company representatives were unable to come to a settlement over the question of arbitration. The attitude of the men and the company has been referred to previously in the ELECTRIC RAILWAY JOURNAL.

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Purchase Before Council

Chicago Body Hopes to Present Traction Measure to Voters on Feb. 24

The Chicago municipal traction ordinance providing for a referendum on the co-ordination deal there in connection with local railway operation has been placed in the hands of the City Council by Mayor Dever with a request to rush passage so the proposition can go on the ballot on Feb. 24. The ordinance provides what is known as a half billion dollar plan for immediate subway construction, purchase and extension of the Chicago Surface Lines and an offer to the Chicago Rapid Transit Company for the elevated properties.

ORDINANCE ADVANCED PROMPTLY

The ordinance was submitted on the morning of Jan. 5 and in the afternoon had gone to the local transportation committee of the Council, which had Major R. F. Kelker, Jr., and finance and legal experts before it for questioning. Aldermen who oppose the extensive building of subways brought up the unprofitable operation of subways in New York to Major Kelker as an argument against certain parts of the proposed Chicago system and Major Kelker answered them with figures from the Dec. 20 issue of the ELECTRIC RAILWAY JOURNAL. He quoted the figures on part of a mile to show that the approximate cost per mile in New York was $25,000,000 as against $10,000,000 a mile in downtown Chicago and $3,000,000 in outlying districts. His argument carried the point of relative profit.

The ordinance is based on satisfactory consummation of arrangements for buying the Surface Lines at $162,700,000 or less, based on an appraisal being made by Major Kelker, William J. Hagenah and Gen. William Barclay Parsons, the latter having sent H. M. Brinckerhoff from his New York office to represent him.

The elevated lines situation is dealt with frankly in the ordinance, the administration recognizing that Samuel Insull has solid backing for his statement that the mortgages on the lines interfere with a sale. However, the maps of the proposed unification and primary stage of extensions as explained by Major Kelker show the existing elevated lines completely bottled up by proposed city lines, which, while not in direct competition, will limit elevated zones of influence to small fringes paralleling the lines.

All the city-built tube and elevated structures are laid out so that connections can be made with the elevated lines should a later purchase be made, or the city lines can cover much the same territory by surface line feeders using universal transfers.

Every effort was made to utilize all the existing facilities. In one case an arrangement was made to purchase 3 miles of Rock Island Railroad suburban line to give rapid transit to a district 16 miles from the business section in the loop.

An official summary of the ordinance drawn by Corporation Counsel Bush and Alderman Swartz, authors of the measure, has been issued to explain the terms of the purchase. This statement ran to the extent of several newspaper columns.

Settlement of Issues at Toledo Expected Shortly

Many electric railway developments are expected in Toledo in 1925. The Community Traction Company favors a cross-town bus line and co-ordination of bus and railway operation so as to afford extensions to some new sections of the city.

Then the application of the Toledo People's Motor Bus Company to put in a competing bus system is before the Public Utilities Commission at Columbus. It is not believed any action will be taken on this application before the settlement of a similar issue in regard to Cleveland. The chances are that any decision of the commission will be appealed to the Supreme Court and that it will be many months before a definite decision on the competitive bus operation is had. The Ottawa Coach Line, which is the largest independent and competing line in Toledo, has already announced a fare increase effective on Jan. 9, at which time the cash fare will be 10 cents and a token rate of six for 40 cents will be started. Heretofore, the fare has been 7 cents cash.

Settlement of the power cases started many months ago are also expected in the next few weeks. The question of jurisdiction of the Public Utilities Commission on power rates between the Toledo Edison Company and the Community Traction Company has been argued, but as yet no decision has been rendered. The courts have already refused jurisdiction under the Milner ordinance. In the meantime the Toledo Edison Company has voluntarily reduced the power rate for the traction lines.

Los Angeles Banishes the Horse

DOBBIN is peremptorily banished from a district several square miles in Los Angeles, Cal., under the McClintock traffic ordinance, effective Jan. 22, but six months' grace is allowed for gradual enforcement of the new rules. During the six months horse-drawn vehicles are excluded from this area in rush hours.

The new ordinance provides for traffic lanes and rules for pedestrians, the same as motorists. There will be "No walking" and "No standing" signs. Fine and imprisonment will be the punishment for disregarding them. The signs for pedestrians will be painted on the sidewalks.

Jaywalking is forbidden, and those who cross the streets afoot are to be compelled to signal their intention with upraised arm, just as autoists signal for turns. Some long street blocks will have pedestrian-crossing zones painted in the middle.

Detroit Extends Bus Service

Motor Coaches Used as Feeders for Existing Trolley Lines with a Charge for Transfer

Bus service with single-deck coaches was started on Jan. 1 by the Department of Street Railways, Detroit, as a short extension to its Mack Avenue line, and on Jan. 4 a similar service was begun as an extension of the service on the East Warren Avenue line. The buses used were secured from the Dodge Brothers Motor Company on a rental basis with the understanding that the department may purchase them if it so desires at the expiration of 3 years.

In addition to these routes, the department also has two routes operating from the northern end on its Woodward Avenue line and a short route on the west side of the city, connecting with its trolley line on Grand River Avenue.

The fare charged on these buses is 10 cents cash or a street railway ticket and 4 cents additional. Street railway tickets are sold nine for 50 cents, the railway cash fare being 6 cents. This bus fare entitles a passenger to a free transfer to the street railway cars. If a second transfer is desired, it can be secured for 1 cent additional.

A passenger on a street railway who wishes to transfer to a bus can secure a transfer by the payment of 4 cents additional fare. The transfers used are of the usual kind, arranged to be punched for time, but read in large letters: "To Motor Coach" or "To Street Car," as the case may be.

The buses used have a capacity for 21 seated passengers. The seats are upholstered in real leather. Pneumatic tires are used. The bus floor is of double thickness to keep out cold and dust, and the center aisle is slightly depressed, so that the mat which occupies this space comes flush with the floor line. This type of mat prevents the passenger from slipping when he enters or leaves the coach.

Urban Bus Lines in Virginia Improperly Protected

There is insufficient credit base in Virginia to warrant a feeder bus system being organized as an auxiliary to electric railway service in cities. So the Virginia Railway & Power Company, operating railways in Richmond and Norfolk, holds in a recent issue of "Public Service News," published by it. In explaining why it cannot at this time agree to supplement its urban lines with buses the company said:

> Our company stands ready to supplement its service with buses and even blimps, if necessary, and it has done everything possible to get a proper credit base for such investment in the state of Virginia so that it might be in a position to invite and attract the capital needed from time to time to furnish an adequate transportation service, but this has not yet been accomplished.
>
> . . . In Virginia the bus has been declared a common carrier only on state highways, not in the cities; in the cities it is still a free lance and subject to most any kind of competition the different localities might devise. The basis for investment in bus transportation offered investors in other states does not prevail in Virginia cities and any investment which has been made so far is purely speculative. . . .

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Binghamton Company Seeks Seven-Cent Fare

The Binghamton Railway, Binghamton, N. Y., at a recent meeting of Common Council presented a petition asking permission to increase its fare within the city limits to 7 cents. The company is unable to continue operating under the existing 6-cent rate, it is declared. Unless the 7-cent rate is permitted, the petition sets forth, the company will be compelled to curtail operations greatly or appoint a receiver to conduct its affairs. The great increase in the use of automobiles is declared one of the moving causes for the failure to meet expenses under the present fare schedule. The communication was referred to the finance committee of the Council.

The petition alludes to the receivership of William G. Phelps, which was terminated Jan. 1, 1924, and appended a statement which showed the company had operated at a loss during the last year.

A comparison of the net corporate income during 1924 and 1923 showed a deficit of $20,214 for the year 1924, and this, added to the previous deficit of $41,997 for 1923, made a total deficit of $62,211.

The petition set forth that no dividends had been paid on the capital stock of the company since 1913. The company had been forced to curtail its service greatly already, especially on its outlying lines, the report said.

Municipal Ownership Talk Revived in Winnipeg

A special committee may be appointed by the new City Council of Winnipeg, Man., at the first meeting of that body this month for the purpose of considering the advisability of taking over the railway from the Winnipeg Electric Company. The matter is now under discussion in municipal circles, and it is felt that early action to deal with the question is desirable. The city will have to give its decision on the franchise question in June of 1926, which will probably mean that the electors will be consulted in a referendum at the next civic elections.

The preliminary procedure suggested is that the committee thus appointed should devote itself to ascertaining all the facts relating to the railway and the probable obligations which would have to be assumed provided it were acquired under the terms of the agreement. It is also proposed that a survey of railway situations be made in other cities, particularly Toronto and Detroit.

Railway Restrained from Operating Buses

Rumored plans of the Stark Electric Railroad, Alliance, Ohio, to purchase three buses for use between Canton and Alliance were blocked on Jan. 3, when the Stark County Common Pleas Court issued an injunction against the railway restraining it from operating buses either in Canton or Alliance or on the highways between the two cities.

The case was started by Mrs. Sadie Salisbury, Canton, proprietor of a bus line which has been operating for six years. This company at present operates buses over the Canton-Alliance highway.

Charges that the Stark Electric was conspiring with Samuel Derenberger to compete with her have been made by Mrs. Salisbury.

The restraining order expires on Jan. 12, when a hearing will be held on a permanent injunction. Mrs. Salisbury says the railway has no authority from the Ohio Public Utilities Commission to operate buses.

A short time ago the Stark Electric started half-hour service over the entire line from Salem to Canton, a distance of about 40 miles. This is effective from about 5 o'clock in the morning until 7 o'clock at night.

Uniform Bus Regulation Urged in Oregon

Operators of buses in Oregon—and electric railways are included among them—are agitating for regulation of authority over their industry. It is cited that buses operating in and out of Portland are under the jurisdiction of the police department as represented by the motorcycle squad, the traffic officers and the patrolmen. In addition, there is a superintendent of motor buses, with uniformed officers and special deputies, who makes rules and interprets them. Moreover, there is no real basis of taxation. A bus company in Portland must pay a gasoline tax, a special license tax and $4 to the state. The city imposes a bus tax, as does the federal government, and the manufacturers also pay a federal tax of 5 per cent of the price of the bus. Operators must also furnish a public liability and property damage bond and an insurance policy to the Public Service Commission of Oregon. The bus owners are willing to comply with any centralized authority, but insist that something be done to eliminate this scattering of supervision.

Suburban Riders Will Pay Same Fare as Cleveland Riders

The City Council of Lakewood, a suburb of Cleveland, has agreed to have its car riders pay the prevailing rate of fare charged Cleveland car riders, and as a result, John J. Stanley, president, has withdrawn from service one-man cars he had been using on one of the main lines operating through Lakewood. Lakewood has a franchise calling for a 5-cent fare, but the rate in Cleveland now is 6 cents, with a 1-cent charge for transfer. The Lakewood City Council agreed to permit the Cleveland rate of fare on its lines if Mr. Stanley would withdraw the one-man cars.

The Cleveland rate of fare is to go into effect 40 days from Jan. 5, although it is unlikely that a referendum will be called on the Council's action, as many Lakewood citizens had expressed their willingness to pay the Cleveland rate of fare, despite the company's franchise, if Mr. Stanley took the one-man cars off the Clifton line.

Committee Will Decide Service for Reading

The Selectmen of Reading, Mass., have voted to cancel a contract under which the Eastern Massachusetts Street Railway has operated a bus service between North Reading Center and North Reading Junction at a cost of $2,200 a year to the town to cover the deficit. The contract expired on Oct. 31. The town agreed to pay $2,200 for another year, but the Eastern Massachusetts had been operating at a loss very much larger than the $2,200 and proposed a schedule of fewer trips per day. As the railway declined to maintain the old schedule and the Selectmen declined to accept the new one, though they had agreed upon the $2,200 deficit, the Selectmen recently decided to cancel the contract. The company has agreed, however, to maintain the service for a reasonable length of time. A committee has been appointed to provide service over the route which the Eastern Massachusetts will abandon. A schedule of the service will probably be offered for public bids within two or three weeks.

Bus Ordinance in Lansing Upheld

Judge Leland W. Carr, in Ingham County Circuit Court, has denied a temporary restraining order against enforcement of the Lansing ordinance regulating routes of buses operating out of the city. An injunction was sought by the Michigan Highway Transportation Association on the ground that the ordinance conflicted with a legislative act of 1923 placing control of buses with the Michigan Public Utilities Commission. The association is expected to appeal.

Higher Fares Authorized in Madison

The Madison Railways, Madison, Wis., on Jan. 5 put into effect the following new rates: Cash fare for adults, 8 cents; cash fare for children under 12 years, 4 cents; tickets or tokens for adults, 17 for $1; tickets or tokens for high school students, 10 for 50 cents, and two children under 12 on one adult ticket or token.

The new schedules, put into effect by an order issued by the Wisconsin Railroad Commission, are authorized in order to permit the company to make the extensions and replacements as outlined in the program agreed upon by the representatives of the company, the city and the commission. Details of the program were referred to in the Oct. 25, 1924, issue of the ELECTRIC RAILWAY JOURNAL. The order also makes it possible for the company to increase the wages of its men to the extent of $10,000 for this year. Based on the number of riders during the past year, the company expects to raise $80,000 additional revenue under the new schedule, which will enable it to carry out the improvement program. It is estimated that the entire program will cost $700,000 and be spread out over a period of 7 years.

The commission will have supervision over the excess revenues to be derived

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from the additional fares and also over the moneys to be obtained through the sale of new securities. This means that the excess over and above the operating expenses must be used for replacements and extensions.

With an adequate increase in revenue, the company will this year carry out the following improvements as part of its program of improvements: Rebuilding, double tracking and paving of Atwood Avenue from Division Street to Fair Oaks Avenue; double tracking and paving Breeze Terrace from University Avenue to Regent Street and purchasing 17 cars, replacing nine.

Renewed Agreement in Cincinnati Expires June, 1926

The agreement between the Cincinnati Street Railway and the Cincinnati Traction Company, Cincinnati, Ohio, that grew out of the negotiations for a new franchise has been renewed. The agreement expired by limitation on Jan. 1, but a new one became effective immediately thereafter. The new date of expiration is June 30, 1926. By that time the new city manager form of government will have been functioning in Cincinnati six months. This was contemplated in connection with the new agreement. Those who are interested in a new franchise considered that if Mayor Carrel succeeds in defeating the negotiation of a new franchise in the year that remains of his term, the new régime will have an opportunity to bring about a new contract. The renewal of contractual relations between the two companies that would be perfected if a new contract were approved would eliminate the Cincinnati Traction Company as the operating company. Its interests would be bought out by the Cincinnati Street Railway. It is understood that the modifications in the contract between the two companies were very slight.

Competition in Tacoma Reduces Railway Service

The Tacoma Railway & Power Company, Tacoma, Wash., is curtailing its service in an attempt to offset the loss of business to jitneys, fostered by Mayor A. V. Fawcett. The curtailment is being extended to lines paralleled by buses. In general, the cuts have been confined to service in outlying residential districts, in an effort to keep up service in the sections of heavier travel.

The unrestricted licensing of jitneys by the City Council, at the request of Mayor Fawcett, is a part of the Mayor's pre-campaign promises to give the city of Tacoma a 5-cent railway fare or drive the railway from its streets. The railway states that 5,000 persons are being carried daily by the jitneys. This means a loss of between $250 and $300 a day for the company.

After a two weeks investigation by its public affairs committee, the Kiwanis Club of Tacoma urged in a public resolution that efforts be made to co-operate with the traction company in furnishing better service to all parts of the city.

The City Commissioners of Tacoma have declared themselves entirely out of sympathy with the Mayor's plan. They have expressed the opinion that the jitney holds no promise of an adequate, reliable form of transportation for the city. At present 20 jitneys, ranging in capacity from 7 to 35 passengers, are skimming the cream from the railway by serving only the shorter and easier routes.

Portland Extensions Discussed

At a recent traffic hearing before the City Council Franklin T. Griffith, president of the Portland Electric Power Company, Portland, Ore., stated that car lines would be built to any and all sections of the city if the people were willing to pay for the service. Mayor Baker declared that the railway must provide adequate service to all parts of the city, and that if the company would not do this he would favor granting a franchise to some company that would. Mr. Griffith announced that his company would meet the city on any reasonable plan for extensions of lines. Matters relating to providing adequate service to the outlying districts were referred to John M. Mann, Commissioner of Public Utilities, who was directed to hold hearings, make a thorough study and report to the Council.

Milton R. Klepper, attorney for the Portland Motor Coach Company, is asking for a franchise over five routes in the downtown district. He said that his concern was prepared to lay $500,000 on the table before the Council whenever that body wanted to see it. Mayor Baker replied that this sum would be but a "drop in the bucket" in the cost of furnishing adequate transportation service for the city; that many millions of dollars have been invested by the Portland Electric Power Company, and that he would not be a party to any plan of competition, if that company would give the service needed.

Mr. Griffith stated that his company had in mind a crosstown bus line, a line over the new Ross bridge and the St. Johns bus line. He pointed out that the residential development of the city had been mostly at the ends of car lines, and the problem before the company was whether the extensions could be made to pay

He pointed out that the Pacific Coast cities are large in area but are thinly populated. This presents a difficult problem for the traction companies to settle. He stated that 25 of the 32 railway lines in the city were not paying. He declared that if the bus lines served the city as the car lines do, they could not do it profitably at any such fare as proposed in the franchise of the Portland Motor Coach Company.

Mr. Griffith said that a zone system of fares would make it possible for each line to meet its own expenses, but he added that American people were opposed to such methods. Mayor Baker feels that a satisfactory plan for providing better service can be worked out with the company. He is proceeding in his consideration of the matter on that basis.

News Notes

Increased Rate Until June.—The Public Service Commission has issued an order granting to Leverett S. Miller, receiver of the Westchester Street Railroad, permission to charge until June 1, 1925, the increased rate of fare granted last June for transportation of passengers upon the Tarrytown, Silver Lake Park, Scarsdale and Mamaroneck Avenue lines.

Seeks Higher Rates.—A flat passenger rate of 3 cents a mile for the Joplin & Pittsburg Railway was asked in a petition filed in the federal court in Kansas City by Murdock H. MacLean of Chicago, receiver for the company. The present rates are 3 cents a mile in Missouri, 3.6 cents in Kansas and an interstate ticket is 3.6 cents. The petition also asked that fare be changed in incorporated towns along the line of the railway, a 5-cent fare for children and 10 cents for adults. In the petition Mr. MacLean asked a ninety-day trial of the new rates and then a permanent order if they proved desirable.

Higher Rates Approved.—Fares on the Rochester & Syracuse Railroad and connecting with Port Byron and Auburn will be increased 0.6 of a cent per mile over the former 3 cents a mile straight rate, effective on Jan. 18. The increase has received the approval of the New York Public Service Commission.

Fare Controversy Over.—The California Railroad Commission, upon request of the complainant, has dismissed the complaint of the city of Alameda against the Southern Pacific Company and the Key System Transit Company, involving one-way and commutation fares between Alameda and San Francisco.

Will Reconsider Fare Clause in Franchise.—Rather than have the International Railway abandon its Sugar Street line, Niagara Falls, with the possible application for abandonment of other local lines where the company is reported to be losing money through the 5-cent fare, the Niagara Falls City Council is reported to be willing to change the company's franchise so as to allow it to appeal to the Public Service Commission for a reasonable rate of fare. The commission recently decided that it was without authority to increase fares from 5 to 7 cents owing to certain provisions in the franchise. The commission, however, agreed to allow the company to abandon its Sugar Street line. The International will continue to operate the Sugar Street line until an agreement can be reached with the City Council.

Railway Man Receives Honor.—J. P. W. Brown, general superintendent of the Nashville Railway & Light Company, Nashville, Tenn., has been declared the most valuable citizen of Nashville in 1924. This is the opinion of Kiwanis, which calls together a representative from each civic club to name the person whose service to Nashville has been of the highest character.

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Pamphlet for Utility Investors.—A treat for the new year in the form of a pamphlet is "The Security Survey," which will appear quarterly, so that those who own securities of the Illinois Power & Light Corporation may know about the developments and facts of interest regarding their investment and the company back of it. The January number requested helpful suggestions and constructive criticisms.

Arrested Operators Discharged.—Seven operators of one-man cars in the city of Buffalo charged with violating the new anti-one-man car ordinance enacted by the City Council over the objection of the city law department were discharged when arraigned for trial in City Court. Despite the ruling of the court, Mayor Frank X. Schwab has ordered the police department to arrest other operators of one-man cars on local lines of the International Railway who were found to be driving cars faster than the ordinance allows. Traffic police have arrested additional motormen and their trials have been adjourned until Jan. 23. Counsel for the railway contended in court that the ordinance is illegal and that the authority for regulating one-man cars rests entirely with the Public Service Commission, which already has held a hearing in Buffalo on the application of the city to force the abandonment of the one-man cars.

Ordinance Restricts "Jitney Buses."—The Board of Aldermen of the city of Louisville recently passed an ordinance which will have to go before the City Council regulating fares, routes, carrying capacity and overcrowding of "jitney buses" and forcing drivers of such cars to put up a $500 real estate bond for each one operated. It is also understood in Louisville that there is a movement under way for a bill before the next Legislature to force all owners of automobiles to carry insurance and to arrange for liability coverage in the event of accident.

Asks Co-operation of Automobile Owners.—The Oklahoma Railway, which has failed to obtain relief from adverse traffic conditions in Oklahoma City, Okla., has undertaken to work out its own salvation by inducing automobile owners to refrain from using the downtown streets for car storage during business hours. Placards have appeared in all local cars reading: "Automobiles for pleasure; street cars for business." The recent cold weather and bad condition of the streets have caused hundreds of automobile owners to avail themselves of electric transportation, and the company has sought to secure their continued patronage and co-operation by urging the advantages of the street car for everyday business travel.

Extra Fare Charged.—A new tariff charging an extra fare of 1 cent for all passengers riding in cars across the Juniata bridge at Lewistown, Pa., was filed with the Public Service Commission recently by the Lewistown & Reedsville Electric Railway. The tariff will become effective Feb. 1. The extra fare is being levied for the purpose of making up the sum of $4,000 charged against the company for repairs on the bridge by the Mifflin County courts. The company has appealed and pending action on the appeal will give rebate slips for the 1-cent fare. Tickets will be sold at 12 for 11 cents or 50 for 45 cents.

Students Ask Special Rate.—A resolution petitioning the Philadelphia Rapid Transit Company, Philadelphia, Pa., to grant a reduced fare to students en route to school was passed recently by a special committee of 100 high school students. The resolution pointed out that many cities and many railroads grant special rates to students.

Money Appropriated for Bus Chassis.—The City Council of Seattle, Wash., has passed an ordinance appropriating $38,000 to purchase truck chassis for five buses, three of which are to be operated on Empire Way, and the others held for emergency use. The superstructure of the five buses will be built in the shops of the Seattle Municipal Railway, thereby reducing the cost. The plan of operation on the Empire Way bus line will be the same as on other bus lines operated by the municipal railway, the fare will be 10 cents cash, or 8⅓ cents token, with free transfers to and from the municipal railway. Request of the Seattle-Rainier Valley Railway to the Council for a bus franchise was opposed by residents of the Empire Way district.

Fares Increased.—With the virtual consent of patrons, fearful of suspension of service under present conditions, the Board of Public Utility Commissioners of New Jersey has approved requests of the Five-Mile Beach Electric Railway in Cape May County, N. J. and of the Atlantic & Suburban Railway, in Atlantic County, to increase rates from 6 to 10 cents. Weekly passes will be issued at $1 each for use between Sept. 15 and June 15 of the ensuing year. The new rate of the Atlantic & Suburban Company, operating between Atlantic City and Pleasantville, will be 16 cents instead of 14 cents. On the three remaining zones the fare will be increased from 7 to 8 cents. Strips now selling at ten for 65 cents will be increased to 70 cents. Similar increases are granted with request to various forms of commutation tickets.

$5 Gift for Employees.—Every employee of the East St. Louis & Suburban Railway, East St. Louis, Ill., received a Christmas present of $5 together with a personal letter from W. H. Sawyer, president, replete with the Yuletide sentiment. The letter also thanked the workers for the splendid co-operation accorded the management in the past and requesting a continuation of this spirit.

Wants to Extend Bus Service.—The St. Louis Bus Company, a subsidiary of the United Railways, has asked the Board of Public Service of St. Louis, Mo., for permits to operate two more bus lines as feeders to existing railway lines.

Bus Line Given Up.—The bus line operated between Beverly and Essex, Mass., since early in the summer was abandoned on Dec. 1, according to an announcement by officials of the Eastern Massachusetts Street Railway. The revenue did not pay the expense.

Commission Against Higher Fare.—For the second time within the last 6 months the Public Service Commission has handed down a decision adverse to the International Railway, Buffalo, in its attempt to secure a higher rate of fare on local lines in the cities of Tonawanda and North Tonawanda. The company asked a fare of 14 cents between certain points in the two cities. The commission held that the franchises limit the rate of fare and the commission is without authority to increase the charges without the consent of the municipal authorities.

Interurban Puts on Buses.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, has instituted bus service connecting Waterloo, Independence and Jesup. Buses stop on signal at any point along the route to receive or discharge passengers.

Limited Service Authorized.—Rapid service over the East St. Louis-Belleville, Ill., division of the East St. Louis & Suburban Railway was made possible on Dec. 15 by the City Council of East St. Louis permitting the railway to run limited trains on the division. The cars formerly stopped in East St. Louis only at certain street. The fast cars would utilize the Day line or old Belleville Electric tracks to Mount Hope Cemetery, where they would connect with the main line of the Belleville-East St. Louis division.

Would Operate Buses Between Buffalo and Niagara Falls.—Application has been made by the International Bus Corporation, Buffalo, a subsidiary of the International Railway, to the municipal authorities of Tonawanda and North Tonawanda and to the town board of Tonawanda for permission to operate a de luxe bus line between Buffalo and Niagara Falls, via Kenmore and the Tonawandas, and also over streets and highways in the towns and cities between Buffalo and Lockport.

Policies for Christmas Gifts.—Christmas presents in the shape of $500 life insurance policies were presented to 5,901 public utility employees of the North American Light & Power Company and subsidiary companies. The blanket amount of the company's gift policies is nearly $3,000,000. Subsidiary companies of the North American Light & Power Company are the Illinois Power & Light Corporation, Illinois Traction System, Missouri Power & Light Company, Kansas Power & Light Company and Iowa Power & Light Company. The employees' policies were taken out in the Travelers' Insurance Company, Hartford, Conn.

Skip-Stop Arrangement Planned.—The Jacksonville Traction Company, Jacksonville, Fla., will put the skip-stop service into effect during rush hours in South Jacksonville. This will be undertaken to relieve the congestion.

"Azuride" Wins Prize.—An eleven-year-old school boy won the prize of $5 in car tickets offered by the Tri-City Railway, Davenport, Iowa, for suggesting the name since adopted for the publication which will be distributed soon in the cars. The winning name was "Azuride." The little paper will be printed twice a month and placed in the cars. It will contain information of interest to passengers.

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Financial and Corporate

Story of Receivership

Indiana Interurban Unable to Pay Bonds and Meet Interest—Road Hard Hit by Private Auto

The receivership for the Union Traction Company of Indiana was precipitated by the inability of the company to pay bonds, interest and other fixed charges amounting to more than $300,000. This inability was occasioned by a large decrease in the earnings of the company during 1924, resulting in a reduction of more than $500,000 in the gross revenue for the year. It was impossible to meet this decrease in receipts by corresponding reductions in operating expenses, and the company, therefore, found itself at the close of the year without the large sum of money necessary to pay its bond interest and without the credit required for a loan of that magnitude.

CREDITOR BROUGHT ACTION

As explained in the ELECTRIC RAILWAY JOURNAL for Jan. 3 the receiver was appointed on the application of the Westinghouse Electric & Manufacturing Company, which asserted that the defendant is indebted to the plaintiff for $74,192, a sum long past due. It further was alleged that the railway has other debts it is unable to pay and is in imminent danger of insolvency. The complaint also alleged the company was unable to pay $281,125 in semi-annual interest and $29,150 in rentals that were due the first of the year.

Arthur W. Brady, receiver and president of the company, says that the buses and the privately owned automobiles, with their lack of state regulation in contrast to the regulation imposed on the electric and steam lines, have been the principal factors that have contributed to the present condition of the company. Largely on this account the company has filed a petition with the Indiana Public Service Commission for permission to abandon its interurban service between Anderson and Middletown and to substitute the operation of a bus line for the present traction service. The diminished earnings on this branch are attributed by the petition largely to the bus line between Anderson and Newcastle by way of Middletown, "which motor bus line is not subject to any regulations or restrictions in respect to the service it shall give or the rate it shall charge."

FUNDS NEEDED FOR IMPROVEMENTS

The petition states that funds are needed to improve the property and service on other lines and that it is unfair to discriminate against patrons of the other lines who contribute the earnings from which deficits must be paid on the line sought to be abandoned.

The Union Traction Company is the pioneer interurban system in Indiana. The first interurban in the state was built and operated between Anderson and Marion more than 30 years ago with Charles L. Henry, Indianapolis, and Philip Matter, Marion, as the promoters. This road subsequently was acquired by the Union Traction Company with Mr. Henry president and general manager. When he sold his interest, George F. McCulloch, now dead, became the president and general manager. He was succeeded by Mr. Brady, formerly Mayor of Muncie, Ind., who has been president for many years. Harry A. Nichol is general manager.

The system of the Union Traction Company consists of 455 miles of road. In addition to the extensive interurban lines it includes city systems in Anderson, Muncie, Marion and Hartford.

Electric Railways in California Issue $13,067,496 in Securities

During the 12 months ended Dec. 31, 1924, the California Railroad Commission authorized public utilities to issue $237,875,848 of stock and bonds, and other evidences of indebtedness, the largest amount ever authorized by the commission in any one year since March 23, 1912, the effective date of the public utilities act. In addition to granting applications to issue $237,875,848 of securities during 1924, the commission denied applications to issue $100,000 of securities and dismissed without prejudice applications to issue $1,178,358, making a total of $239,154,206 acted upon during the year.

The amounts authorized during 1923 and 1924 are divided into various classes of securities as follows:

Class	1923	1924
Stock	$74,809,880	$128,391,109
Bonds	115,290,210	102,027,900
Notes	340,845	4,201,838
Equipment trust certificates	6,362,000	3,255,000
Total	$196,802,935	$237,875,847

Of these totals electric railways issued $13,067,496 in securities in 1924 and $29,059,093 in 1923.

Gross Earnings Up in Philadelphia

The Philadelphia Rapid Transit Company, Philadelphia, Pa., rounds out its fiscal year with about $45,460,000 gross revenue, comparing with $44,930,491 for 1923. The company has had the benefit of the new rates of fare for only a little more than three months, but the gain in passenger revenue during that time is said to be about in conformity with the company's estimated requirements.

For 1924 a small surplus over all charges will be shown, the rate relief having made it possible to earn substantially the 10 per cent wage dividend for employees, amounting to between $1,850,000 and $1,900,000, in addition to the 6 per cent dividend for stockholders, amounting to $1,800,000. In 1923 the wage dividend was not earned by $50,000.

Receivers Appointed for Oklahoma Railway

Judge F. E. Kennamer in the Oklahoma federal court, Western district, on Dec. 27 granted the plea of bondholders for the appointment of a receiver for the Oklahoma Railway, Oklahoma City, Okla. George A. Henshaw, a former member of the Oklahoma Corporation Commission and a well known Oklahoma City attorney, and John W. Shartel, president and general manager of the company, were appointed co-receivers. They are to give bonds of $20,000 and are to file an inventory within sixty days of the company's finances, including its assets and liabilities. The court will not pass on the application of the bondholders to abandon some of its unprofitable lines in Oklahoma City until this report is made to the federal court. Mr. Henshaw among other duties will handle the public relations of the company.

The receivership was granted on a showing by the bondholders to the court that the Oklahoma Railway last year lost about $100,000 on operation of its Oklahoma City lines, due largely to automobile and jitney competition.

Before it went into receivership the company had filed an application with the State Corporation Commission asking for permission to increase its rates to 10 cents single fare, three fares for 25 cents. This plea is set for hearing Jan. 10.

Mr. Henshaw has announced that a complete survey of the company's property, both local and interurban, will be made by G. H. Clifford, Fort Worth, general manager of the Northern Texas Traction Company, which in 1924 won the $1,000 prize and certificate awarded by the Coffin Foundation each year to the electric railway in the United States making the most notable contribution to the advancement of the industry.

$821,459 Spent in Chicago on Subway Surveys—None Built

For thirteen years Chicago has been studying the feasibility of subways, and in that period of time the sum of $821,459 has been spent in "surveys" and "reports," with not a spadeful of earth turned as yet. City Controller Martin J. O'Brien recently disinterred these facts.

With close to $1,000,000 in reports filed, the City Council about six months ago authorized another inquiry to disclose "how, when and where, if subways are found practicable, they may be built."

The money for the various reports has come from the city's share of the traction receipts, paid under the terms of the 1907 traction ordinance, whereby the city gets 55 per cent of the net receipts of the Chicago Surface Lines.

This traction fund now totals $40,376,776, having grown from the first deposit of $1,556,809, to which has been added interest of $8,480,353.

Bion J. Arnold made the first survey of the city's traction needs in 1911. He recommended subway construction. His report cost the fund $24,642. In 1912 Mayor Carter Harrison created a sub-

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way and terminal commission which undertook a new study of the Chicago traction problem. After three years of study, a "comprehensive" subway plan was recommended, at a cost of $120,071. Then in 1916 another $203,882 was spent for the so-called Ridgeway-Arnold-Parsons report. Ridgeway and Parsons collaborated with Walter Fisher in a supplemental report in 1917, for which the trio were paid $76,820, and in 1918 Mr. Fisher received $13,621 for other data on the same subject.

A junket of the local transportation committee of the City Council to California to study traction in the Western cities cost $22,331. Lawyers received $1,143 from the fund for their advice to the committee in 1919. In 1920 and 1921 Mayor William Hale Thompson dipped into the fund to finance his scheme for a 5-cent fare. A 35-page booklet was issued at a cost of $195,093.

During the Thompson administration, three attorneys, William H. Sexton, Stephen H. Foster and Jerome Frank, retained by the transportation committee, were paid $57,790 for their legal advice in 1922. These same lawyers, who advised Mayor Dever during his recent unsuccessful negotiations with the Surface Lines, together with Major Kelker, received $76,063 from the fund in 1923, and until Aug. 1, 1923, the same men have thus far been paid $30,896 from the fund. There has apparently been no effort since then to bring the figures down to date.

Electric Line on Long Island Suspends

The Nassau County Railway, Sea Cliff, Long Island, has stopped running its cars. The company quit because it found it could not make any profits. It had operated a trolley line for 22 years between Sea Cliff, L. I., and Glen Cove. The road is more than 10 miles long.

Insull Interests Acquire Chicago & Joliet Electric Railway

Van Horn Ely, president of the American Electric Power Company, Philadelphia, Pa., has announced the company has sold several properties to the Central Illinois Public Service Corporation, acting for the Middle West Utilities Company of Chicago, Martin J. Insull, president. They include the Chicago & Joliet Electric Railway, operating in Joliet, Ill., with suburban lines leading into Chicago; the Quincy Gas & Electric Company, Quincy, Ill.; Warsaw Gas Company of Warsaw, Ind.; Goshen Gas Company, Goshen, Ind.; Niles Gas Light Company, Niles, Mich. The last three companies are in the vicinity of South Bend, Ind.

Funds for this purchase have been obtained by the sale of $4,800,000 of serial gold notes, a public offering of which will be made shortly by Halsey, Stuart & Company. The notes will be in $1,000 denomination, dated Jan. 2, 1925, and serial maturities of the issue in the amount of $400,000 will be taken up each quarter beginning April 1, 1925, and ending Jan. 1, 1928. The first four maturities will bear 4½ per cent interest while the remaining eight will bear 5 per cent. The Central Illinois Public Service Company will sell preferred stock among its customers over the three-year period for the purpose of permanently funding the purchase and meeting the note maturities.

Taxation Amount Cut. — At a final hearing of the Board of Equalization on Dec. 31 the assessment for taxation of the Louisville Railway, Louisville, Ky., for 1925 was cut $434,633. The amount previously set was $12,934,633.

Does Not Seek Abandonment Permission.—Upon request of the applicant, the California Railroad Commission has dismissed the application of the Los Angeles Railway for authority to discontinue the operation of portions of certain of its electric railway lines.

Line Abandoned.—The Danville & Sunbury Transit Company ceased operations on Dec. 31. The line operated between Danville, Pa., and Riverside, on the south side of the Susquehanna River, and ran to the Danville State Hospital. No disposition has been made of the equipment.

Purchases of P. R. T. Stock for Employees Increase.—New purchases of Philadelphia Rapid Transit Company stock for account of the wage dividend fund amounted to 40,000 shares during 1924. This makes the employees' total holdings of the stock 160,000, including 10,000 shares in the Welfare Association, or more than 26.6 per cent ownership of the entire 600,000 share capitalization.

Profit in Seattle.—The Seattle Municipal Railway lines, Seattle, Wash., showed a net profit of $27,760 over all charges for October, according to the report submitted to the City Council by Superintendent of Railways D. W. Henderson. Gross revenues for the month were $515,377, with operating expenses $334,436. In addition, $62,930 was set aside as the month's share of the annual interest charges and $70,250 for bond redemptions. The usual allowance of $20,000 was also made.

Extra Dividends Declared.—The Tri-City Railway & Light Company, Davenport, Iowa, has declared four quarterly dividends of 2¼ per cent each, payable April 1, July 1 and Oct. 1, it was announced, to stockholders of record on the twentieth day of each preceding month. This is an increase of one-fourth of 1 per cent on the common.

Merger Bill Reappears in Washington.—A bill has been introduced in the Senate by Senator Ball of Delaware, chairman of the Commission on the District of Columbia, which proposes a merger of all the street railways, bus companies and the Potomac Electric Light Company. If these companies do not merge voluntarily, Senator Ball's bill proposes that the Public Utilities Commission take charge and operate them as a unified system after July 1, 1925. A measure similar to this has made its appearance at every session for the last 10 years at least.

Denver Decree Signed. — Federal Judge Symes has signed a formal decree giving the Denver Tramway, Denver, Col., permission to raise fares to any figures that will bring a net return annually of $2,207,500, or 7½ per cent on the valuation of $23,516,769 plus a reserve for depreciation of $450,000. The decree affirms the company's right to a perpetual franchise, obviating the necessity of an election in 1926.

Urges Purchasing of Substations.—J. D. Ross, superintendent of the light department at Seattle, Wash., has urged the City Council to take immediate steps to purchase the substations used by the Puget Sound Power & Light Company in supplying power to the Seattle Municipal Railway. He declares that each day of delay costs the city $2,000, paid to the Puget Sound Company for power, and points out that a year's advance notice is required for taking over a substation.

Authorized to Issue Stock.—The Key System Transit Company, Oakland, Cal., has been authorized by the California Railroad Commission to issue prior preferred and preferred stock to refund $56,000 of bonds of the San Francisco, Oakland & San José Railway, provided that the owners of the bonds in each instance pay to or otherwise account for, to the Key System Transit Company, the amount to which they, as owners of such bonds, are entitled to receive from the proceeds of the foreclosure sale of the properties securing the payment of the bonds, and provided further that the holders of such shares of stock shall have no right to any dividends payable prior to Jan. 1, 1925.

Abandonment Under Consideration.—A. N. Broadhead, president of the Chautauqua Traction Company, Jamestown, N. Y., announces that the company is seriously considering abandoning the entire system between Jamestown and Westfield, a distance of 32 miles, because the line is a losing proposition. An application is now pending before the Public Service Commission by the company to abandon that part of its line between Mayville and Westfield.

Equipment Sold.—The property of the Titusville Traction Company, Titusville, Pa., was sold on Jan. 3 to S. W. Platt & Company, a wrecking concern of Pittsburgh, and Lessor Levy, who will junk the property. The price was $22,250. The sale was made to satisfy the first mortgage of $106,000, on which $24,000 in interest had accrued. The mortgage foreclosure proceedings were preceded by discontinuance of railway service on Dec. 31. Titusville is a town of 8,432 inhabitants. The railway operated 16 miles of line there.

Interborough Shows Deficit.—The total revenue of the Interborough Rapid Transit Company, New York, N. Y., for the 5 months ended November, 1924, was $23,311,852, an increase of $392,545 over a similar period for the year previous. The operating expenses, taxes and rentals paid the city for the old subway were $15,562,302. This represented a decrease of $534,802 over a similar period in 1923. The income available for all purposes was $7,223,987. This is an increase of $1,677,055 over a similar period in 1923. After the consideration of charges and rentals, the balance after actual maintenance showed a deficit for the 5 months' period ended Nov. 30, 1924, of $459,711. This figure was an increase of $1,297,514 over the balance shown in the five months ended Nov. 30, 1923.

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Personal Items

Recognition for Long Career

J. K. Buchanan Becomes Executive Head of West Virginia Properties —Paul H. Sommer Advanced

J. K. Buchanan, general manager of the local utilities in Morgantown, W. V., has been made a director, vice-president and general manager of both the West Virginia Utilities Company and the Wheeling Public Service Company. Mr. Buchanan succeeds M. R. Stern, Wheeling, who has resigned to take up private engineering work. Mr. Stern will, however, be retained as consultant to assist Mr. Buchanan, for a while at least, in handling the Wheeling properties.

With the elevation of Mr. Buchanan to the executive position in the two companies comes the announcement that Paul H. Sommer, for the past two years superintendent of the electric department in Morgantown, will become general superintendent of the properties there. He will take over the routine administration formerly handled by Mr. Buchanan.

Mr. Buchanan has been identified with the local utilities since 1904, when he entered the employ of the Union Utility Company, then a Morgantown corporation directed by Harry Warfield as executive officer. Mr. Buchanan rose steadily in the confidence of the owners until he reached the position of general superintendent, which he has held for the last 15 years. The Union Utilities Company then became the Union Utilities Company and later the West Virginia Traction & Electric Company, at which time its ownership passed into the hands of Eastern interests. During the war-time period there was a receivership, but this was lifted on April 1, 1920, and the property, along with that at Wheeling, was purchased in 1921 by Anderson & Company, Providence, R. I.

The Morgantown properties of the West Virginia Utilities Company include electric, water and street railway departments and are conservatively valued at $4,000,000. The Wheeling properties, estimated at $3,000,000, include a 25-mile street car line running from Wheeling to West Alexander, through the well-known "Pike" section of Wheeling and the suburban towns; a bus line within the city of Wheeling and an electric service to domestic customers along the territory served by the traction line.

F. H. Raub has succeeded E. S. Stoffet as supervisor of the Atlantic City & Shore Railroad, Atlantic City, N. J.

W. E. Johnson has succeeded C. N. Garrison as assistant secretary and assistant treasurer of the Springfield Traction Company, Springfield, Mo.

C. G. Staples is secretary and treasurer of the Springfield Electric Railway Company of New Hampshire, with office at Brattleboro, Vt.

Walter P. Ordway is president of the Somerset Traction Company, Skowhegan, Me. He succeeds F. W. Briggs.

President Herr of Westinghouse Company in New York

E. M. Herr, president of the Westinghouse Electric & Manufacturing Company, has removed his headquarters from East Pittsburgh to New York. Mr. Herr is leaving Pittsburgh after having been there since 1899. He has achieved a notable place in industry. Graduating from the Sheffield Scientific School of Yale in 1884, he became a special apprentice of the Chicago, Milwaukee & St. Paul Railway in the motive power department and later was engaged as mechanical draftsman and test engineer and superintendent of telegraphs and later as a division superintendent of the Burlington Railroad. In 1890 he was appointed master mechanic on the Chicago, Milwaukee & St. Paul and in 1892 was appointed to the superintendency of the Grant Locomotive Works in Chicago. In 1895 he was in Russia establishing locomotive works there. Then he was made general superintendent of the Gibbs Electric Company, Milwaukee, and later superintendent of motive power of the Chicago & Northwestern Railroad. Thence he went to a similar position on the Northern Pacific. In 1899 he entered the service of the Westinghouse company and after various promotions was elected to the presidency in 1911.

Thomas I. Carter is one of the vice-presidents of the Cumberland & Westernport Electric Railway, Frostburg, Md.

Winchell G. Yates, who for the last four years has been superintendent of track and railway of the Wheeling Traction system, Wheeling, W. Va., tendered his resignation to G. S. Wills, general superintendent, to take place immediately. He is leaving the traction company to go into the contracting business for himself. Mr. Yates has been connected with the Wheeling Traction Company for more than 13 years.

V. D. Jennings is treasurer of the Central Maine Power Company, Rockland, Me. The position was formerly held by Walter S. Wyman, since made president.

A. William Sperry, New Haven, Conn., has been engaged as managing engineer of the Danbury & Bethel Street Railway, Danbury, Conn., now in receiver's hands.

C. H. Forsgard is general superintendent of the Durham Public Service Company, Durham, N. C.

A. I. Hunter, formerly treasurer of the Grand Forks Street Railway, Grand Forks, N. D., is now head of the claims department. E. J. Lauder has assumed the position of treasurer.

New Vice-President

Official of Canadian Westinghouse Company Made Vice-President and General Manager at Pittsburgh

F. A. Merrick, vice-president and general manager of the Canadian Westinghouse Company, Hamilton, Ont., has been elected vice-president and general manager of the Westinghouse Electric & Manufacturing Company in general executive charge of the activities of the company.

Mr. Merrick is a native of New Jersey. He received his technical education at Lehigh University. Shortly after graduation he was employed by the Steel Motors Company, a subsidiary of the Lorain Steel Company, where he was responsible for many important electrical inventions and rose to the position of chief engineer. Later he joined the Westinghouse company at East Pittsburgh, Pa., in charge of the production of street railway motors. After the formation of the Canadian Westinghouse Company, Ltd., in 1903, he was sent there as superintendent, and later became manager of works and finally vice-president and general manager.

During the war Mr. Merrick had charge of the factory of the New England Westinghouse Company, at Chicopee Falls, Mass., from which the government's requirements in Browning machine guns were supplied. Mr. Merrick had to reorganize and largely re-equip this factory in order to handle this work, but he was able to complete 60,000 guns within 11 months after operations were begun. This manufacturing achievement is regarded as probably without parallel.

After the war Mr. Merrick was located in London for 2 years as special representative of the Westinghouse Electric International Company. He then returned to Canada.

S. R. Perkins has succeeded B. Crow as master mechanic of the Tulsa Street Railway, Tulsa, Okla.

A. W. Walton has succeeded W. K. Danvers as electrical engineer of the Oklahoma Railway, Oklahoma City, Okla. O. P. Johnson is now road-master, replacing T. McMains.

Dwight B. Dean, formerly vice-president and general manager of the Kuhlman Car Company, Cleveland, Ohio, has become associated with the Yellow Coach Manufacturing Company, Chicago. Mr. Dean will represent the Yellow Coach Company, with headquarters in the Hanna Building, Cleveland.

George L. Markland is second vice-president of the Stone Harbor Railroad, Stone Harbor, N. J. Joseph P. Lodge, formerly secretary, has been succeeded by James B. Lichtenberger, who is performing the duties of secretary and treasurer.

E. E. Thornton, for many years in charge of train service of the Key System Transit Company, operating in Oakland and San Francisco, Cal., has been succeeded by Harry T. Brobeck, former superintendent of the central division. Mr. Thornton has been with the Key System Transit Company for

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about 25 years and is now on sick leave. Charles E. Bourn has been transferred from superintendent of the western to the central division, while W. B. Hamilton takes charge of the western division, left vacant by Mr. Bourn. W. A. Niedrich has been promoted to acting night superintendent to replace W. B. Hamilton.

Obituary

Capt. H. M. Stine

Capt. Henry M. Stine, secretary and treasurer of the Pennsylvania Street Railway Association since 1909, with offices in Harrisburg, Pa., died at his home in that city recently. Captain Stine's public activities had a large scope. He was president of the County Commissioners' Association of Pennsylvania in 1923 and at the time of his death was chairman of the legislative committee of that body. He was serving his third term as County Commissioner. He served one term as Recorder of Deeds and three years ago he was a candidate for the Republican nomination for Congress from the Harrisburg district.

His military career covered two wars. In the Spanish-American War he was second lieutenant in Company I, Fourth Pennsylvania Volunteer Infantry. He saw service in Porto Rico. After the war he was active in the National Guard, and at the entrance of the United States in the World War he was placed in command of Company C in the Eighth Regiment, which became the 112th Infantry in the reorganization of the army on a war basis. He mustered his company in Chambersburg in 1917. The 28th Division, of which the 112th Infantry was a part, trained at Camp Hancock, Augusta, Ga. There Captain Stine was taken ill and he was sent back home while his company went overseas without him. During the Mexican border campaign in 1915 and 1916 Captain Stine recruited in Harrisburg and throughout the Cumberland Valley for the Pennsylvania National Guard.

Captain Stine was a graduate of Dickinson College, Carlisle, and of the Dentistry School of the University of Pennsylvania. He was 63 years old.

Charles Smith, the Pittsburgh representative of William Wharton, Jr. & Company, Inc., Easton, Pa., died in Pittsburgh on Dec. 16.

Fred Pefferkorn, superintendent of the Municipal Street Railway, Alexandria, La., died recently.

Frank Edward Haylock, for many years active in the coach painting departments of electric and steam railroads and for the past 16 years foreman of the paint department at the shops of the Schenectady Railway, Schenectady, N. Y., died on Jan. 2, at the age of 60, after an illness of six weeks. Mr. Haylock prior to his connection with the Schenectady Railway held responsible positions in the paint departments of the New York Central & Hudson River Railroad and the Rutland Railroad.

S. D. Hutchins

Well-Known Figure in Central Electric Railway Territory Had Long Been Ill

S. D. Hutchins, representative of the Westinghouse Air Brake Company at Columbus, Ohio, with which he had been connected since May, 1896, died in that city on Jan. 5. "Judge" Hutchins, as he was familiarly known, was one of the most beloved of traction men in the Central West. He was genuinely accepted in the counsels of the electric railway men, as much so, as though he were himself an operating man. It had become the custom to intrust to him for years past the work of making all business arrangements for the meeting places and accommodations of the Central Electric Railway Association. He will be remembered by many for his handling of the boat trips on the Great Lakes, if for no other of his labors. Nothing was left undone by him on these occasions.

S. D. Hutchins

Judge Hutchins was an unusual figure in many respects. Not only was he loved and esteemed by his immediate associates and the officials of all the electric railways with whom he came in contact, but he commanded the respect and the admiration of the rank and file of the electric railway employees. In fact, it was his work in behalf of the trainmen that led to his appellation of "Judge." No matter how busy he was, Judge Hutchins always found time to act in arbitration cases and was drafted for service in many of them. In these his rôle was always that of umpire. Men and companies alike had absolute confidence that he would decide on the facts and the facts only. Bias had no part in his make-up. He knew the trials and tribulations of the men—for he had been one of them—and he knew the trials and tribulations of the managements, for he was close to them. Morever, he had the faculty of expressing himself tersely and still not giving offense. In all of this work his services were rendered gratis.

Judge Hutchins was born in Cleveland, Ohio, on May 25, 1855. He was an old-time locomotive engineer. He ran on the Big Four Railroad between Columbus and Cincinnati from 1876 to 1895 and left that company as the senior engineer with first choice of runs and engines. For seven years he ran the best fast passenger train between Columbus and Cincinnati. Because of the skill he displayed in braking this train smoothly, he won the attention of H. H. Westinghouse, who sent for him to come to Wilmerding at the former's expense for an interview. Inasmuch as the Judge had secured patents on an angle cock and a new air gage, he thought that the purpose of the interview was to make some deal in this connection. As it turned out, however, Mr. Westinghouse offered him a job as chief instructor of the Westinghouse Air Brake Company, with the duties of showing locomotive engineers all over the country how to operate the brakes. It seems that the brake apparatus was being accused of all the shortcomings, whereas it was largely a matter of lack of skill on the part of the men. After two or three months of consideration of leaving the railway with which he had been so long connected, Judge Hutchins finally went over to his new work on an extended leave of absence. The railroad really never did let him quit.

In his new work he traveled all over the country for about two years, and then put in three years with headquarters in Buffalo. Judge Hutchins refused to move his family from Columbus, Ohio, and the company told him that if he would not move his family to Buffalo the company would move his office to Columbus. And it did so. It sent him there to act as special engineer in connection with air-brake equipment installations and troubles. Finally he picked for himself the job of straightening out air-brake equipment in use on the electric railways, most of which consisted of a simple tank of air piped to the brake cylinder with a plain valve for control. If anything happened to the air piping on either side of the valves, the air exhausted to the atmosphere and the car was without brakes.

The first work was to eliminate the weaknesses of this system. There followed the introduction of "automatic air." The first equipment of this type was put on an interurban car at Ypsilanti, Mich., the Judge personally spending two weeks "on his back" to make the installation. But the triple valve used was not flexible enough and he was recalled in a week and had to change back to straight air. But from this start experiments were made and the control gradually perfected. By his single-handed work and persistence, and almost complete control of design for the electric lines, there was developed a uniform system of braking, about the only thing that is a complete standard on the electric railways.

For a long time Judge Hutchins had not been well. Unsparing of himself, he did too much. So a year ago the Westinghouse company sent Mr. and Mrs. Hutchins abroad for a 10 weeks' trip. His health improved for a time after his return, but the improvement was only temporary. He had made inroads on his energy too deep to be repaired. The dear old Judge has passed on to his great reward.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Copper Production Breaks Records

Production of copper in 1924 broke all previous records except those for the years during the World War. The output from domestic sources during the last year, as determined by the Geological Survey from reports of the smelters showing actual production for 11 months and the estimated production in December, was 1,628,000,000 lb., compared with 1,435,000,000 lb. in 1923, an increase of more than 13 per cent over that year, which itself was the highest of record with the exception of the war years. The smelter production of copper in December, as estimated by the producing companies, was 137,000,000 lb., a little higher than the average monthly production for the year, or at the rate of about 1,644,000,000 lb. a year.

The production of new refined copper from domestic sources, determined similarly, was about 1,764,000,000 lb., compared with 1,464,000,000 lb. in 1923. In 1924 the production of new refined copper from domestic and foreign sources amounted to about 2,293,000,000 lb., compared with 1,980,000,000 lb. in 1923. In addition to the output of new refined copper about 136,000,000 lb. of secondary copper was produced at the refineries, compared with 131,000,000 lb. in 1923, so that the total output of refined copper was about 2,429,000,000 lb. in 1924 and 2,111,000,000 lb. in 1923.

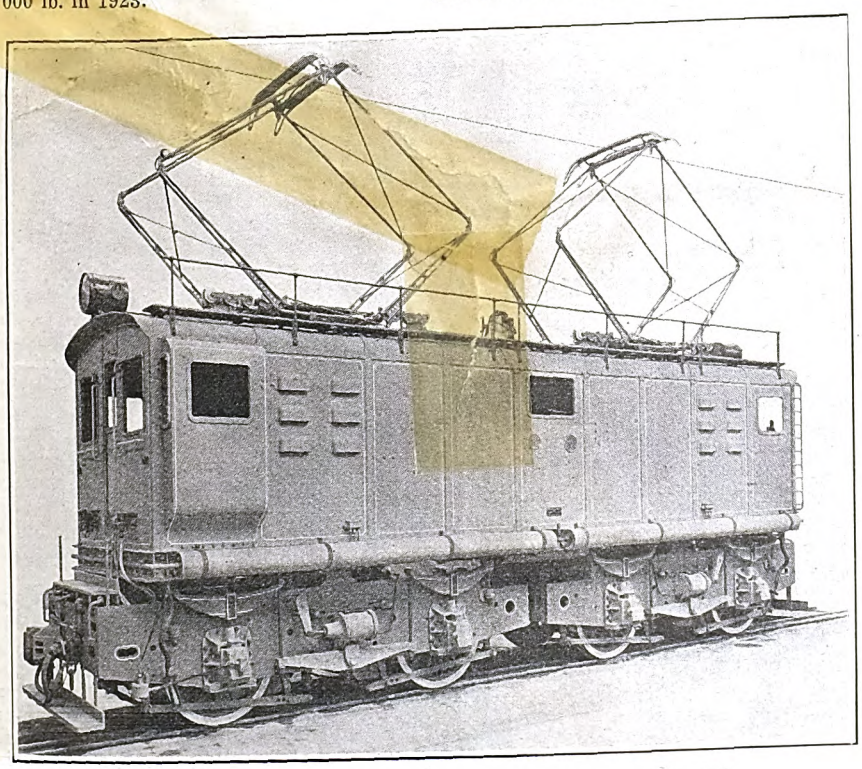
The imports of unmanufactured copper during the first eleven months of 1924, according to the Bureau of Foreign and Domestic Commerce, amounted to 706,127,251 lb., compared with 676,473,388 lb. during the entire year 1923 and 541,013,220 lb. in 1922. The imports of copper in the first eleven months of 1924 were thus higher than during any previous calendar year. The exports of copper also increased substantially during the first eleven months of 1924 and were higher than those recorded for any other calendar year except 1917. The exports in December will probably not be quite large enough to make the figures for 1924 surpass those for 1917. The exports for the first eleven months of 1924 were 1,018,426,271 lb., compared with 829,314,002 lb. during the entire year 1923.

Double-Truck Articulated Locomotives for Montreal

The Harbor Commissioners of Montreal recently received the four electric locomotives ordered in January, 1924. A brief description of these locomotives was given in ELECTRIC RAILWAY JOURNAL for Dec. 13. Further details are now available. Each locomotive weighs 100 short tons, all the weight being carried on the driving wheels. They are of the box cab, double-truck, articulated type, equipped with four 430-hp. motors. Power is transmitted to the axle through twin spur gears. The trucks and superstructure were built by Messrs Beyer Peacock & Company, Manchester, England. Motors and electric control equipment were manufactured by the English Electric Company at its Preston works, where the locomotives were finally assembled and equipped. Following the usual Canadian practice they are fitted with M.C.B. automatic couplers, airbrake equipment, brake blocks, etc., made according to American standard design.

Some of the principal features are given in the following table:

Total weight	100 (short) tons
Weight per driving axle	25 (short) tons
Diameter of driving wheels	50 in.
Total wheel base	28 ft. 0 in.
Fixed wheel base	9 ft. 3 in.
Length over buffers	40 ft. 0 in.
Length over cab	33 ft. 9 in.
Brakes	Westinghouse, 14 E.L.
Pantographs	Two, air-operated
Number of motors	Four
Type of motor	DK. 96, 430-hp.
Line voltage	2,400 d.c.
Motor voltage	1,200-volt d.c.
Motor ventilation	Forced
Tractive effort on tread of wheels and speeds (forced ventilation):	
Continuous rating	32,000 lb. at 16 m.p.h.
One-hour rating	43,000 lb. at 15 m.p.h.
Normal acceleration	50,000 lb. up to 14 m.p.h.
Maximum acceleration	60,000 lb.



English Built Locomotive for Montreal Harbor Commission

Street Car Production Expected to Increase

Carry-over orders and inquiries now in the market indicate that the average percentage of operations of the J. G. Brill Company this year will exceed that of 1924. This expected increased operation applies not only to the building of street cars, but also to other modes of transportation, such as gasoline-propelled cars for steam railroads and buses.

Standard Invoice Will Be Discussed at Conference

A national conference called by R. M. Hudson, chief of the Division of Simplified Practice of the Department of Commerce, will be held under the auspices of the National Association of Purchasing Agents on Jan. 14 at the Commerce Building, Washington, D. C. For some time now 41 national trade associations have been giving considerable attention to the national standard invoice, purchase order and inquiry forms. Mr. Hudson in a letter of invitation to the conference says that the general adoption and use of the proposed standards will work toward the elimination of those wastes resulting from the present tremendous diversity

Metal, Coal and Material Prices

Metals—New York	Jan. 6, 1925
Copper, electrolytic, cents per lb	15.08
Copper wire base, cents per lb	17.25
Lead, cents per lb	10.075
Zinc, cents per lb	8.18
Tin, Straits, cents per lb	60.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.125
Somerset mine run, Boston, net tons	2.05
Pittsburgh mine run, Pittsburgh, net tons	1.875
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.95
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1620
Turpentine (bbl. lots), N. Y., per gal	0.93

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in the forms used for the purposes indicated. Many national organizations have been actively promoting the use of the standard invoice among their members. Secretary Chandler of the National Association of Purchasing Agents states that if the customers can save $15,000,000 by the use of standard invoices, the sellers can save at least an additional 10 per cent of that amount.

Rolling Stock

Madison Railways, Madison, Wis., plans to purchase 17 new cars, replacing some of its older cars. This policy was adopted following authorization by the Wisconsin Railroad Commission for a fare increase, referred to elsewhere in this issue.

Coast Cities Railway, Asbury Park, N. J., will purchase seven light-weight, double-truck safety cars. The Board of Public Utility Commissioners has approved a car trust agreement between the company, operating in Monmouth County, N. J., and the J. G. Brill Company, Philadelphia, for the purchase. Under the agreement the company will issue 60 serial notes totaling $77,635, of which $65,909 is the principal and $11,726 interest.

Manhattan Bridge Three-Cent Line, New York City, N. Y., suffered the loss of one car by fire in the carhouse at the Flatbush Avenue extension. The damage was estimated at between $5,000 and $6,000.

Sand Springs Railway, Tulsa, Okla., suffered the loss of its carhouse and machine shop by fire on Dec. 18. Sixteen passenger cars, one express car and an electric locomotive were destroyed with the building. The company was seriously handicapped in operation as it had only seven interurban cars left. Sleet and cold greatly handicapped firemen in combating the flames. The fire, caused by an overheated stove in an express car, caused a loss estimated at $200,000.

Track and Line

San Diego Electric Railway, San Diego, Cal., has constructed an overhead viaduct crossing at Torquois Street, La Jolla, at a cost of $40,000.

Dallas Railway, Dallas, Tex., will consider the extension of the State Street line on Capital Avenue between Haskell and Henderson Avenues in East Dallas. The proposed extension would be nine blocks and cost between $30,000 and $35,000. It would serve a district now without adequate railway connections.

Stockton, Cal.—The State Railroad Commission has authorized the construction of a subway under the Southern Pacific and Western Pacific rail crossings at Miner Avenue. The project involves an expenditure of $308,000. By the terms of the decision the city, which was the applicant, was to pay 50 per cent of the construction cost, the Southern Pacific 30 per cent and the Western Pacific 20 per cent, all exclusive of paving expenses, which are to be borne by the city of Stockton.

Womelsdorf, Pa.—It is said that an electric railway will be constructed next spring from Womelsdorf, Berks County, to Kleinfeltersville, Lebanon County, at a cost of approximately $300,000. This will make direct trolley connections between Reading and Harrisburg. The line will be 6.06 miles long. It will start at Womelsdorf and go through Newmanstown, Millbach and Kleinfeltersville.

New York, N. Y.—The Board of Transportation issued an invitation to contractors to bid for the installation of tracks and other miscellaneous work in the construction of the Flushing extension of the Queensboro subway. The bids will be received and publicly opened by the Board of Transportation at 49 Lafayette Street, New York City, Jan. 9, 1925. Recently the board awarded a contract for the construction of foundations, retaining walls and embankment for the Corona storage yards, which will be connected by two spur tracks with the Flushing extension. The Flushing extension will be a three-track elevated railroad.

Power Houses, Shops and Buildings

Tennessee Electric Power Company, Chattanooga, Tenn., will erect shortly a one-story fireproof garage, 75 ft. x 100 ft., for its railway property. The estimated cost is $15,000.

Boston, Mass.—It is decided that a station will be built at the corner of Charles and Cambridge Streets on the Boston Elevated line to Cambridge. The trustees of the Boston Elevated Railway have voted to accept the proposition. Plans for the station have the approval of the Public Utilities Department and of the Boston Transit Division. It is expected that the details will be worked out shortly and that the city of Boston will advertise for bids on the construction work.

Petaluma & Santa Rosa Railroad, Petaluma, Cal., has ordered from the Westinghouse Electric & Manufacturing Company a 300-kw. rotary converter for installation in a power substation which is to be erected at Forestville. The improvement will cost $15,000. Delivery is expected May. 1.

Trade Notes

Mitchell-Rand Manufacturing Company, New York, N. Y., held its annual dinner of officers, salesmen and factory managers, Dec. 27, at the Building Trades Employers' Club. Previous to the dinner the regular monthly meeting of the salesmen was held in the offices of the company. After the dinner the officers of the company, salesmen, factory managers and guests attended a performance of "New Brooms" at the Fulton Theater.

Electric Service Supplies Company, Philadelphia, Pa., announces that it has assumed the exclusive sale and distribution of the entire output of the Franklin Porcelain Company, Norristown, Pa., manufacturer of high-voltage porcelain insulators and fittings. The modern plant of that company is devoted entirely to the production of the highest quality wet process electrical porcelain for every purpose and is being greatly enlarged in anticipation of a substantial increase in volume of business.

Jackson & Moreland, Boston, Mass., engineers, announce the formation of a department particularly devoted to investigations and reports of a special nature, such as appraisals and rate studies, organization and personnel matters. This department is under the management of Frank M. Carhart.

American Brass Company, Bridgeport, Conn., has booked through the new Kenosha wire mill an order for shipment to the Illinois Central Railroad for the proposed electrification of that company's line out of the suburban district near Chicago. The order calls for products of the Anaconda Copper Mining Company, of which the American Brass Company is a subsidiary, as follows: 130 miles hard drawn grooved copper-trolley wire, 105 miles feeder strand and messenger wire and 82 miles grooved hitenso trolley wire.

Anton S. Rosing, heretofore assistant manager advertising and publications bureau of the Portland Cement Association, Chicago, has been appointed publicity manager of the Armco Culvert & Flume Manufacturers' Association, Middletown, Ohio, in charge of advertising, publications and other publicity work. Previous to joining the staff of the Portland Cement Association he was engaged in active construction work, principally railroad construction, and for two years was assistant professor of civil engineering at Michigan Agricultural College, Lansing.

New Advertising Literature

International Motor Company, New York, N. Y., has issued the anniversary number of the "Mack Bulldog." One of the pictures shows the original Mack Trucks, Inc. plant and working force.

American Institute of Steel Construction, New York, N. Y., has issued "Steel Construction," a booklet which contains the institute's Standard Specification and Code of Standard Practice. The introduction of the book consists of a mathematical explanation of the development of the various formulas recommended in the Specification for the proper reduction of working stresses. A set of charts accompanies the explanation designed to eliminate a vast amount of mathematical calculation in connection with structural steel design. Data are given on action of structural steel members under varying conditions.

Electric Service Supplies Company, Philadelphia, Pa., has issued Bulletin No. 207, entitled "Cass Commutator Smoothing Stones." "Cass" is the new name for the old Aetna commutator smoothing stone.

Ohio Brass Company, Mansfield, Ohio, has issued a folder describing its new O-B trolley base, called Form 4, which has Timken roller bearings, special contact brushes, and a leather cup washer below the bottom bearing to act as a grease seal. The base is very compact and of light weight. It is intended particularly for use on small city cars.

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New York, Saturday, January 17, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

HARRY L. BROWN, *Editor*

Volume 65
Number 3

Repair Shops Are the Heart of Any Transit System

THE importance of adequate facilities for repairing rolling stock was brought out forcibly in the testimony given by several officials of the operating railway companies in New York City and by the chairman of the Transit Commission while testifying in the transit inquiry just concluded there. Under the dual contracts between the city and the companies, the responsibility for providing shops for the rapid transit lines in New York devolves on the city, so that as the hearing progressed, the size, character and extent of the shops now in use by the companies soon became one of the most important questions to be determined by the testimony. The position of the commission and companies was that additional cars, even if provided, could not be kept in service without additional shops, and that delays and accidents are bound to occur more frequently if adequate repair facilities are not available. The contention of the Mayor was that the present shops were not being used to their full capacity.

It is a striking fact, in this connection, that there was general acceptance by all concerned of the principle that good shop facilities are essential to good service. The truth is that the repair shop is the heart of any electric railway system. The track and overhead construction of an electric railway may be compared to the veins and arteries of the human system, and the rolling stock to the blood that is kept circulating. Just as the blood must be brought back to the heart for purification and recirculation, so the cars must be brought into the repair shop for attention, or they will soon be unable to operate.

Even if neglect to provide necessary shop facilities is not carried so far as to stop service, it is poor economy for any company to try to get along with facilities which are inadequate. It is easily possible that a delay on the line due to improper inspection or neglected repair to a car may cause far more loss in fares than would pay for the repair or inspection of that car several times over.

Most railway executives realize the need for good shops, but when appropriations for new tools or increased facilities are being considered there is often the tendency to think the existing facilities are good enough for the present. The situation then arises that additions are made to rolling stock repeatedly without making corresponding provision for shops and storage facilities.

Where this is the case, master mechanics should take the responsibility of bringing to the attention of the management the need and value of increased shop facilities. This they can best do by keeping records to show the savings obtained from new tools and equipment installed in their shops or from increased facilities provided, and then presenting these figures to the management at the appropriate time.

Brooklyn City Issue Quickly Taken

"WAY oversubscribed within an hour." This is the record that was written last Tuesday after the offering made that day of $3,750,000 equipment trust certificates of the Brooklyn City Railroad at the new low rate of 5 per cent. From the standpoint of the bankers the sale was a great success. From the standpoint of the railway and the industry the offering was even more of a success. The Brooklyn offering is by 25 per cent the largest of its kind of which there is record in recent annals of electric railway financing. Moreover, the price at which the issue was placed, returning a yield of only 4.50 per cent to 5.50 per cent, is the best that has been obtained for a long while.

In the steam railroad field equipment issues are regarded as choice securities. The success of the Brooklyn City issue reflects the willingness of the investing public to accord well secured electric railway issues a similar standing. This is all the more notable because electric railway equipment does not lend itself to the same ready interchangeability that steam railroad equipment does. In the past this consideration has imposed a differential between the two forms of security decidedly in favor of the steam railroads.

Participating investment bankers report that they experienced no difficulty at all in disposing of these certificates to private investors. The bulk of the sales was made to insurance companies to be held by them until maturity. This is especially significant, as they are usually considered very conservative. Incidentally the offering shows the growing tendency among the electric railways to take advantage of the aid which the equipment trust affords them to modernize and merchandise. The total of issues of over $200,000 so placed last year was $9,229,600.

So far as this latest issue is concerned there is nothing burdensome in the terms of the indenture under which the securities are issued. The maximum annual "dividend" requirement on the certificates is only $187,500, and the maturities are $375,000 annually over ten years, a period well within the reasonable life of the equip-

This is the issue in January that is devoted essentially to maintenance subjects

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ment on which the certificates are secured. The maximum charge in any year will thus be $562,500. For the year 1924 the company had available a balance of $2,001,720 after the payment of operating expenses, fixed charges, taxes and rentals. The cash payment required was only slightly more than 25 per cent of the estimated cost of the equipment. Incidentally, for those who are given to reading between the lines, the successful placing of an issue of this kind on such favorable terms is a silent but substantial tribute to a management that has not hesitated to put earnings back into the property to the great benefit of the security holders. Every move of this kind by the Brooklyn City has resulted in added economies in operation, and the new equipment, designed in accordance with good, modern practice, may confidently be expected to do more than pay its way from the start. As indicated previously, the success which has attended the placing of this issue is a distinct achievement for the issuing company and it will react to the benefit of the industry.

Bond Maintenance Is Important to Minimize Return Circuit Resistance

BURIED beneath the paving and frequently neglected, the rail bond is one of the important elements in the electric circuit of the railway system. The outgoing distribution system is checked up carefully, as it can be seen, resistance measurements are not difficult and it can be repaired readily. The track circuit, on the other hand, is frequently neglected, as it is hard to check up and hard to get at for repair. Yet, it is good economy to maintain the return circuit well.

The survey on bond testing and maintenance practice published in this issue points out some of the difficulties experienced with rail bonds and the methods of testing and locating defective bonds for repair. In general, the types of bonds with a welded or brazed contact between rail and copper show up the best in service, as there is comparatively little deterioration until failure comes from a complete break of the connection. This makes the detection of defective bonds considerably easier than with the compressed terminal type, which deteriorate gradually and progressively due to corrosion. But repair of the compressed terminal type of bond is easier than for any of the welded types, as it does not require transporting a welding outfit about the property. However, the work done by the ordinary repair crew in replacing compressed terminal bonds is usually not so good as the repair work on welded bonds.

From an electrical point of view, no method of joining the rails can be superior to a continuous rail section without breaks. This can be approximated by the various types of welded rail joints, which not only do not deteriorate, but have a conductivity equal to that of continuous rail or nearly so. While high conductivity can be obtained through bonded joints, it is ordinarily too expensive to put on a sufficiently large area of copper bonds to get as low a resistance as that of solid rail. While the use of welded joints is to be desired by the electrical engineer, there are many places where welded track joints are not desirable, so that there probably always will be many miles of track with bolted joints. Rail bonds are the only available means of insuring good electrical contact on such joints.

The Annual Legacy of Laws

FORTY-TWO legislatures meet this year. Some of them are already in session. Messages from the governors to these bodies are being combed by the editorial writers for evidences of a desire on the part of the newly elected executives to include suggestions to the legislative solons that reflect the party platforms. As in the past, there will be much disappointment and despair.

Not so much because it is New York, but because it is one of the first to come to hand in full and one of the most far-reaching in its significance, is the message of Governor Smith of New York of interest. His stand on home rule and his willingness to play Mayor Hylan's game in part at least are well known, but the people of New York were hardly prepared for the shock which Governor Smith had in store for them. The great bulk of the thinking people of the state are still staggering from the blow he has dealt them. He is for home rule and municipal ownership. There appears to be very slim prospect that his public utility program can be put through. A certain sense of security is to be found in that, but the matter does not end there. There are plausible, very plausible arguments for home rule. Mr. Smith makes the best of them, but in the end home rule is distinctly not in the best interests of the community. In the case of New York City it would undoubtedly be fatal. Yet Governor Smith is for it. He's for it on a wider scale than ever before. He defends openly the municipal operation of bus lines and by implication the municipal operation of subways.

But Governor Smith is not the only one who is sounding the home rule cymbals. The same thing is being done out in Ohio. And, strangely enough, the situation there has two anomalies, both arising out of a controversy in Cleveland. First, it apparently was expected that the state commission would grant a certificate of convenience and necessity to a bus service there that would be in serious competition with the Cleveland Railway. Granting of a certificate under such circumstances would be quite contrary to the principle accepted and followed by nearly all commissions. The other anomaly is that the Cleveland Railway is father to an amendment to a state law which would take from the state commission the authority to grant rights to any bus company within the limits of any large city. In other words, this is going back to home rule, whereas the principle accepted and urged by the national utility and bankers' associations and adopted by nearly all of the state legislatures is that of state as against municipal regulation. It seems unfortunate that this tendency exists in Ohio to resort to measures which are out of line with the accepted view on the part of both the commission and the railway. The position of the railway seems to have been taken as a defensive step against the likelihood of an unwarranted and ill-advised act by the commission.

It appears likely now that bus regulatory legislation will be passed this winter in both Indiana and Missouri, thus bringing these states more nearly in line with others on this matter. Moreover, there is need for strengthening some of the present laws governing bus and truck as common carriers. It will be several months before the oratory subsides sufficiently to permit calm calculation of the results.

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Bond Testing and Maintenance Practice

Types of Bonds Employed, Causes of Failure, Methods of Testing and Replacement Standards Are Summarized for 25 Electric Railways — While Welded Joints Eliminate Need for Bonds, There Are Occasional Failures, so that Checking of the Return Circuit Is Desirable

EVEN with the large increase in the use of welded rail joints there still are many thousands of mechanical joints in use in this country which require the connection of rail bonds to complete the electric circuit with a reasonably low resistance. In order to determine the trend of current practice in bonding and in bond testing, this paper has conducted a survey of large, medium and small electric railway properties that use rail bonds. It was found that while there is a decided trend toward the various types of welded bonds the compressed terminal type of bond is used very largely on the roads included in the survey. Methods of testing have changed but little in recent years. The method of obtaining potential drop across the bond in millivolts compared with the drop across a fixed length of rail is the one in most common use. Out of the 25 properties included in the survey there are but two that use the bond testing car, although several are in use on other properties.

The table included with this article gives the approximate number of bonds in use by the various companies, with the exception of several roads that have incomplete records. Of the number of bonds as stated by the roads giving this information, there were approximately 400,000 compressed terminal bonds, 80,000 brazed bonds, 250,000 arc-welded bonds and 110,000 gas-welded bonds, making a total of 840,000. Thus the compressed terminal bonds represent 48 per cent of those listed.

About 45 per cent of the bonds are of the unprotected type, the greater number of them being attached to the ball of the rail. In general the welded types are more likely to be exposed than the compressed terminal type. The method in most general use for protection is to place the bonds under the joint plates. The only companies stating that they protect their bonds by placing them under the base of the rail are the Northern Ohio Traction & Light Company, the Eastern Massachusetts Street Railway, the Detroit Department of Street Railways, the Rockford & Interurban Railway and the Bangor Railway & Electric Company. The latter two companies also use bonds placed under the joint plates.

Causes of Failure of Bonds

The causes of failure vary considerably with the type of bond. In all cases, however, loose mechanical joints are mentioned as one of the chief reasons for failure. With bonds of the compressed terminal type the most important cause given is corrosion, according to nine companies. Loosening of the pins and terminals is given by four companies, and improper application of the bonds by three. Other causes mentioned are splitting of the rail web at the bonding holes, breakage of the strands of the copper, vibration, and burning of the terminals. Breakage of strands is the principal cause for failure of brazed bonds, five companies giving this reason. Failure of the brazing is given by two companies as the chief cause of failure, and vibration by two others. One company states that wheels of automotive vehicles shear off the bonds.

Apart from loose mechanical joints, the shearing off of the bonds by vehicle wheels is the principal cause of failure of both arc-welded and gas-welded bonds, according to ten companies. Other causes for the failure of arc-welded bonds are breakage of strands, improper application, poor welding and air pockets in the weld, and breakage of the rails themselves. Miscellaneous causes for failure of gas-welded bonds are vibration, poor welding and air pockets in the weld.

Few Failures of Welded Track Joints

Welded track joints give little trouble from the standpoint of the return circuit. Breakage of the joints is the principal reason for failure of conductivity.

TYPES OF RAIL BONDS IN USE ON 25 ELECTRIC RAILWAYS

Company	Number of Bonds: Comp. Term.	Brazed	Arc Weld	Gas Weld	Number of Bonds: Exposed	Protected	Per Cent Repaired Annually
Los Angeles Railway Corporation, Los Angeles, Cal., per cent	.....	.....	.....	.....	5	95	1.2
Market Street Railway, San Francisco, Cal.	64,700	4,630	0	0	12,790	56,570	5
Denver Tramway, Denver, Col.	0	5,000	25,000	0	30,000	0	5
Connecticut Company, New Haven, Conn.	165,000	25,000	12,000	0	27,000	175,000	Under 5
Georgia Railway & Power Company, Atlanta, Ga.	20,000	0	13,200	9,800	23,000	20,000	4
Aurora, Elgin & Fox River Electric Company, Ill.	100	0	100	0	100	100	7
East St. Louis & Suburban Railway, East St. Louis Railway, Alton, Granite & St. Louis Traction Company, East St. Louis, Ill.	11,750	0	10,750	0	10,750	11,750	2
Rockford & Interurban Railway, Rockford, Ill.	1,000	29,100	4,000	2,500	29,800	6,800	.....
Bangor Railway & Electric Company, Bangor, Me.	.....	.....	.....	.....	.....	.....	20
Boston Elevated Railway, Boston, Mass.	.....	.....	.....	.....	.....	.....	.....
Eastern Massachusetts Street Railway, Boston, Mass.	32,000	0	46,000	0	55,000	23,000	7
Department of Street Railways, Detroit, Mich.	.....	.....	38,316	0	18,827	19,489	0
Saginaw Transit Company, Saginaw, Mich.	.....	0	.....	0	.....	.....	3
Omaha & Council Bluffs Street Railway, Omaha, Neb.	20,120	2,008	0	18,032	13,760	26,400	10
Northern Ohio Traction & Light Company, Akron, Ohio.	8,592	10,000	48,000	20,000	69,344	17,248	12
Pennsylvania-Ohio Power & Light Company and Pennsylvania-Ohio Electric Company, Youngstown, Ohio.	17,435	0	32,350	750	39,900	17,435	3
Charleston Consolidated Railway & Lighting Company, Charleston, S. C.	6,000	0	3,000	0	2,000	.....	14
Dallas Railway, Dallas, Tex.	8,000	0	10,000	0	10,000	8,000	.....
San Antonio Public Service Company, San Antonio, Tex.	5,000	4,000	0	10,000	14,000	5,000	8
Utah Light & Traction Company, Salt Lake City, Utah	29,000	0	0	1,500	1,000	29,000	5
Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va.	14,000 total	all types			.....	.....	3
Virginia Railway & Power Company, Richmond, Va.	5,000	0	400	0	400	5,000	.....
Seattle Municipal Railway, Seattle, Wash.	0	0	0	48,600	18,500	30,100	4
Ohio Valley Electric Railway, Huntington, W. Va.	.....	.....	.....	0	.....	.....	2
Eastern Wisconsin Electric Company, Oshkosh, Wis., per cent	60	30	10	0	60	40	20

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Such failures are infrequent as compared with failures of bonds. The Connecticut Company had a large number of failures of rail welds a few years ago, when it was the practice of the company to weld light rail, but few failures have occurred with heavy rail. On old track the Georgia Railway & Power Company has had as many as 18 per cent of failures of welded joints, but it has had less than 1 per cent on new track. In the period 1921-1923 the Eastern Massachusetts Street Railway had 974 failures out of a total of 89,969 welded track joints. With 347.5 miles of track welded this is 2.8 per mile of single track for the 3 years. The Department of Street Railways, Detroit, has had cracks develop in the upper seams of four joints in new track and 75 joints in old track repaired by the arc-welding process. These cracks were due to lack of proper support of the joints.

The Omaha & Council Bluffs Street Railway has had about 200 failures of welded track joints, or 15 per mile of track that has been welded. On the lines of the Pennsylvania-Ohio Power & Light Company, which uses thermit welds, there have been 12 failures out of 2,930 joints over a period of 8 years, or 0.774 joint per mile of single track. The San Antonio Public Service Company has had failures of 2 per cent of its welded joints. Sixty joints, or 10 per single-track mile, is the record of failures of welded joints on the Utah Light & Traction Company's property. Some failures have occurred on the track of the Newport News & Hampton Railway, Gas & Electric Company where old plates were welded to old rail. However, there have been no failures where the work was done on new track in the original job. Approximately 0.1 per cent of the welded joints have failed on the Virginia Railway & Power Company's track. The Eastern Wisconsin Electric Company has had no failures of welded joints in 2 years.

Methods Used for Bond Testing

The type of instrument used most widely for bond testing is the Roller-Smith direct-reading bond tester. This device is used with current flowing through the rail from normal car operation and indicates the resistance of the bond in equivalent feet of solid rail. Other types of bond testers used are the standard Weston millivoltmeter, the American Steel & Wire Company's bond tester and the Electric Service Supply Company's No. 34,175 tester. While the small companies ordinarily use but one instrument each, several roads have two and the Eastern Massachusetts Street Railway uses eight Roller-Smith instruments. In Omaha a preliminary check is made of potential drop in the various sections by using telephone pairs as leads and obtaining voltmeter readings. These readings are taken for 24 hours. If this check shows a poor section an individual test is made. On some of the Eastern Massachusetts Street Railway's long country lines with infrequent car service it is necessary to feed current through the rail by means of heater coils used as a loading resistance so as to get a sufficient deflection of the instrument. A somewhat similar device made of resistor grids is used by the Virginia Railway & Power Company to get enough current in the rail. The practice on the Seattle Municipal Railway is for the bond tester to carry in his pocket a flashlight cell. This is connected with the instrument leads so as to furnish current across joints to be tested where there is little or no current in the rails, such as at neutral points between substations or near the ends of lines.

Bond-testing cars of the type which was developed a number of years ago by Albert B. Herrick are in use only by the Boston Elevated Railway and the Connecticut Company among the roads replying. The Detroit Department of Street Railways is contemplating the use of such a car. This device gives a graphic record of the resistance of each bond as it is run over the track at a speed of 10 m.p.h. or more. By a check of the location it is possible to determine which bonds have failed. It was at first the practice of the Connecticut Company to refer the location of a defective bond to the nearest pole, but several cases where with more than one bond between poles the repair gang dug up the wrong bond led to a change in practice, so that the car is stopped at the defective bond and its exact location painted so there can be no misunderstanding.

Marking Defective Bonds

In general, two methods are used for marking bonds found defective by the meter methods. One of these is to mark the rail with paint, and the other to mark it with a chisel or a center punch. The Pennsylvania-Ohio Electric Company uses several colors of paint to indicate different test results. A few companies use a colored chalk or crayon for the purpose. Another method sometimes used is to determine the location of the defective bond from some fixed point. The Los Angeles Railway, for instance, indicates the location of the defective bonds on the report sheet by pole numbers. In Detroit the indications are given by house numbers where possible, and chisel marks are placed on the rail as additional identification. At Charlestown a count is made from the nearest special trackwork, while the Virginia Railway & Power Company numbers the bonds from the street intersections.

In Seattle the defective bonds are located with respect to the houses, poles, or other landmarks and listed on blank forms, a copy of which is illustrated with this article. This same form is used by the repair man to indicate the type of bond removed and its condition, as well as the type of bond installed in place of it.

On some roads the bonding crew follows immediately behind the bond tester. In this event, only temporary marks are needed. Railways using this practice are the Bangor Railway & Electric Company, the Eastern Massachusetts Street Railway, and the Newport News Railway, Gas & Electric Company.

Period of Testing

Considerable difference exists in the length of time that the track is allowed to go between tests of rail bonds. A number of the companies included in the survey make tests approximately once a year. These include the Northern Ohio Traction & Light Company the Connecticut Company; the Eastern Massachusetts Street Railway; the Bangor Railway & Light Company; the Detroit Department of Street Railways; the Los Angeles Railway; the Utah Light & Traction Company; and the Aurora, Elgin & Fox River Railway. The Denver Tramway makes bond tests at periods varying from 6 to 9 months. The Seattle Municipal Railway makes tests in paved streets once a year and on unpaved tracks every 6 months. A 6 months period between tests is used by the Pennsylvania-Ohio Electric Company, the Saginaw Transit Company, the Ohio Valley Electric

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Company, and the Eastern Wisconsin Electric Company. Two roads have a period of 2 years between tests. These are the Rockford & Interurban Railway and the Georgia Railway & Power Company. The remainder of the companies included state that the period of testing is irregular.

When Bonds Should Be Replaced

It is noticeable that the failures of the compressed terminal bonds are progressive as the contacts between steel and copper corrode or work loose, while the failures of the welded and brazed types are more or less sudden. With the latter types, so long as several strands of the flexible portion of the bond remain intact, the resistance of the bond will ordinarily be low enough to carry the current without a drop of potential in the track so great as to cause difficulty in operating cars. This makes it easy to determine if the bonds should be replaced, as there is a wide difference in the readings of the testing instrument between good and bad bonds. With compressed terminal bonds, on the other hand, it becomes a matter of determining a limiting resistance which is considered low enough not to cause interference with car service.

A majority of the railways included in the survey give the testing crew tabulated or other information regarding the bonds and the permissible resistance. The equivalent resistance which is considered satisfactory differs with the companies, depending to a certain extent on the amount of traffic and the return current which must flow through the rail. A bond resistance equivalent to 4 ft. of rail is considered satisfactory by the Virginia Railway & Power Company; the Market Street Railway considers the joint all right if the resistance of 1 ft. of rail, including the joint, is not greater than 5 ft. of solid rail; while the Omaha & Council Bluffs Street Railway marks the bond for replacement if it has a resistance exceeding that of 6 ft. of equivalent rail, and the Newport News Railway, Gas & Electric Company replaces the bond if it has a resistance greater than 8 ft. of rail.

Number of Bonds Replaced Annually

The number of bonds repaired or replaced annually varies greatly on the different properties. This is indicated in the right-hand column of the table. On new track, with protected bonds of the welded type, replacements are very few. With the older types of bonds, the replacements may run as high as 20 per cent of those installed. On the Bangor Railway & Electric Company, which has the latter figure for replacement, it is stated that better workmanship which the company is now obtaining will reduce the replacement of bonds to between 5 and 10 per cent a year.

On the lines of the Market Street Railway, when a section of track is overhauled or rebuilt, the bonds are examined and put in first-class condition. Otherwise, the bonds are not investigated. The cost of opening the streets, removing the joint plates and repairing is so high that a slight deficiency in bond conductivity as shown by the testers would not receive consideration, so that the bonds are not tested.

The exposed type of brazed bonds was installed by the Connecticut Company several years ago. A large portion of the bonds have since been replaced in connection with reconstruction work, although at the present time there still are a considerable number of the brazed bonds in service. These are stated to be in as good condition as when they originally were installed. The company now uses the arc-weld exposed type of bond on maintenance work and on new construction on special work.

FORM M116 1000 7-22 Y&M 47164.

MUNICIPAL STREET RAILWAY, SEATTLE

BOOK NO. _____

LIST OF DEFECTIVE BONDS June 21st, 1924 PAGE 4

LOCATION WESTLAKE LINE, Con't. DATE OF REPAIRS: MONTH _____ YEAR _____

TRACK	RAIL	LOCATION	R'D'G	TO BE FILLED IN BY REPAIR MAN		
				TYPE OF OLD BOND	CONDITION	TYPE OF NEW BOND
		Westlake Avenue N.				
West	West	4' north of Building No. 1546				
East	East	1st joint south of door 1547				
East	East	Opposite door 1547				
East	East	2nd joint south of 2nd span wire pole S. of door 1717				

Form Used by the Seattle Municipal Railway for Recording Bond Tests and Replacements

Gas-weld bonds are repaired by the Omaha & Council Bluffs Street Railway when they have been removed for any cause. This is done by grinding the head and stretching the bond straight, after which it is bent to a U shape and placed in stock.

The 4,000 ribbon-type brazed bonds on the lines of the San Antonio Public Service Company have not been found satisfactory. This is due to the excess heat in the installation process weakening the ribbon adjacent to the terminals and causing the ribbon to break under the constant vibration.

Thefts of Bonds Unimportant

Most of the companies included in the survey state that the theft of bonds is now a matter of little or no importance, even when the exposed types are used exclusively. This is probably true in large measure to the types of bonds now in common use being shorter and having so much less copper than the old-style bonds that it does not pay a thief to remove them. Then, too, the welded types are so strongly fastened to the rail that it is quite difficult to remove them. Of the companies making definite statements as to the number of such thefts, the Northern Ohio Traction & Light Company states that 2 per cent of its bonds are stolen annually, while the Pennsylvania-Ohio Electric Company states that 1 per cent are stolen. The Georgia Railway & Power Company loses about 50 bonds a year, and the Omaha & Council Bluffs Street Railway approximately the same number.

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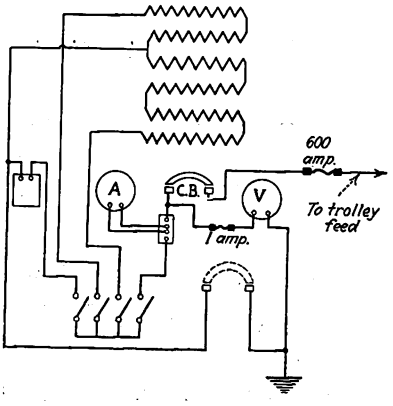
Water Rheostat Used for Testing Circuit Breakers

Close Regulation of Resistance Up to 500 Amp. Is Secured by This Means in Chelsea Shops of Eastern Massachusetts Street Railway

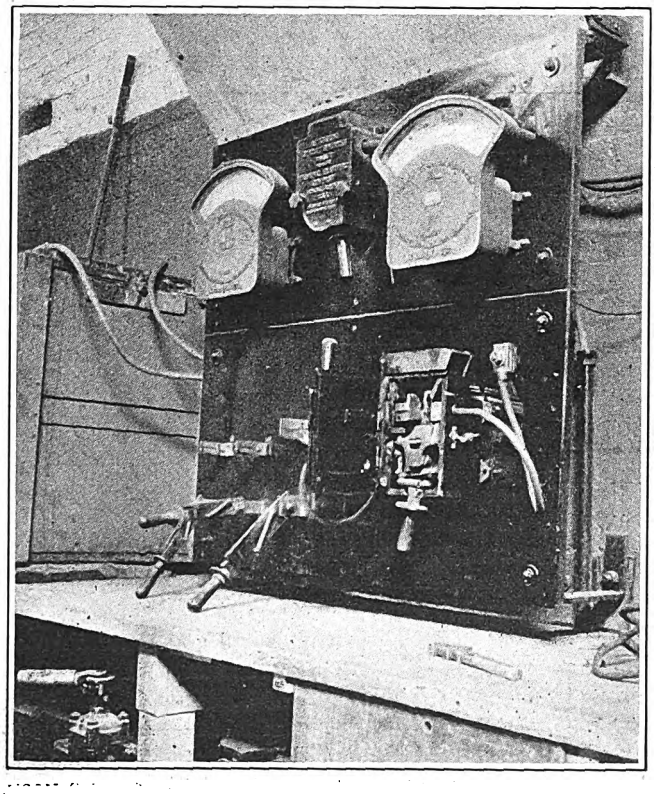
BY H. T. HURLOCK
Engineer Rolling Stock and Shops Eastern Massachusetts Street Railway, Boston, Mass.

ALL circuit breakers passing through the repair department of the Chelsea shops of the Eastern Massachusetts Street Railway are carefully tested before they are returned to service. The outfit used for this work consists of a water rheostat operating in parallel with two banks of grid resistors. The water rheostat is designed with a capacity of 200 amp., while the fixed resistances are 100 and 200 amp. respectively, giving a total capacity of 500 amp.

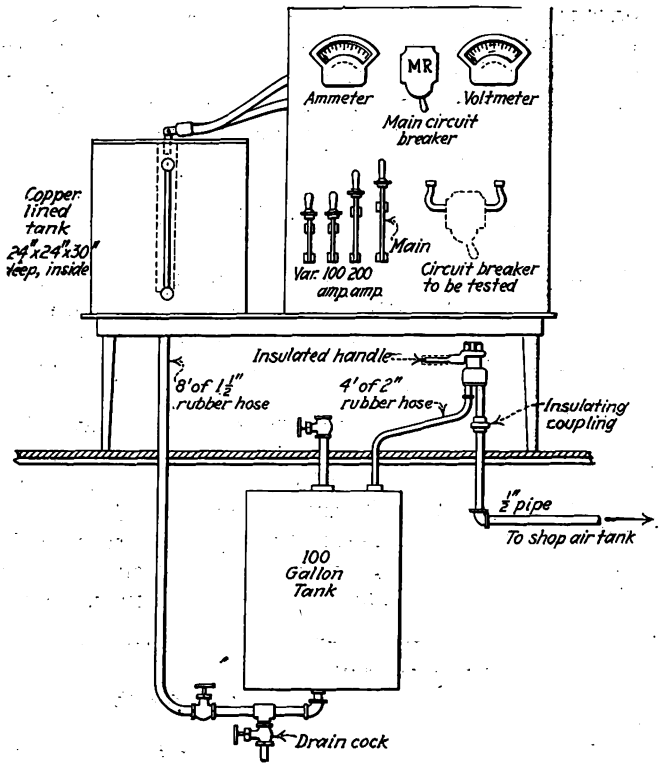


Wiring Diagram of the Testing Apparatus

A shop supply of compressed air pumps brine into the water rheostat from a storage tank located under the floor. The air, which is controlled by an engineer's valve, passes into the top of the storage tank, and thus forces the brine up into the rheostat. To empty the rheostat the air is released to atmosphere, and the brine flows back by gravity into the storage tank. The combination of water rheostat and fixed resistance permits close regulation up to the full capacity of 500 amp.



Circuit Breaker Testing Panel in the Chelsea Shops of the Eastern Massachusetts Street Railway



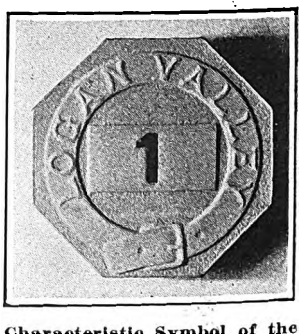
Piping Arrangement Showing How the Level of the Brine in the Water Rheostat Is Controlled

The water rheostat, 24 in. x 24 in. x 30 in. deep, is constructed of wood, copper lined, and has a brine capacity of 50 gal. Two electrodes of No. 14 gage sheet iron 3 in. wide are suspended from the top of the rheostat and spaced 7 in. apart. A water gage is added to indicate the height of the brine. Both rheostat and storage tank are mounted on insulated supports, and rubber hose is used for the connections. The entire apparatus has been built from materials on the property and has given satisfactory results.

It is the practice of this company to set circuit breakers to trip at 150 per cent of the full load rating of the motors, after which the adjustment is pinned to prevent tampering by unauthorized persons. Breakers which are found to be inaccurate in service are returned to the shops for adjustment.

Shopman's Badge Uses Company Symbol

AN OCTAGONAL badge has been devised for the use of the shopmen of the Altoona & Logan Valley Electric Railway, Altoona, Pa. The feature of this badge is a closed belt with a buckle at the bottom and the words "Logan Valley" around the circumference.



Characteristic Symbol of the Logan Valley Line Is Used On Shopman's Badge

The symbol is the same as that long used by the company on the sides of its cars. The badges are made of metal and are manufactured by the Whitehead & Hoag Company, Newark, N. J.

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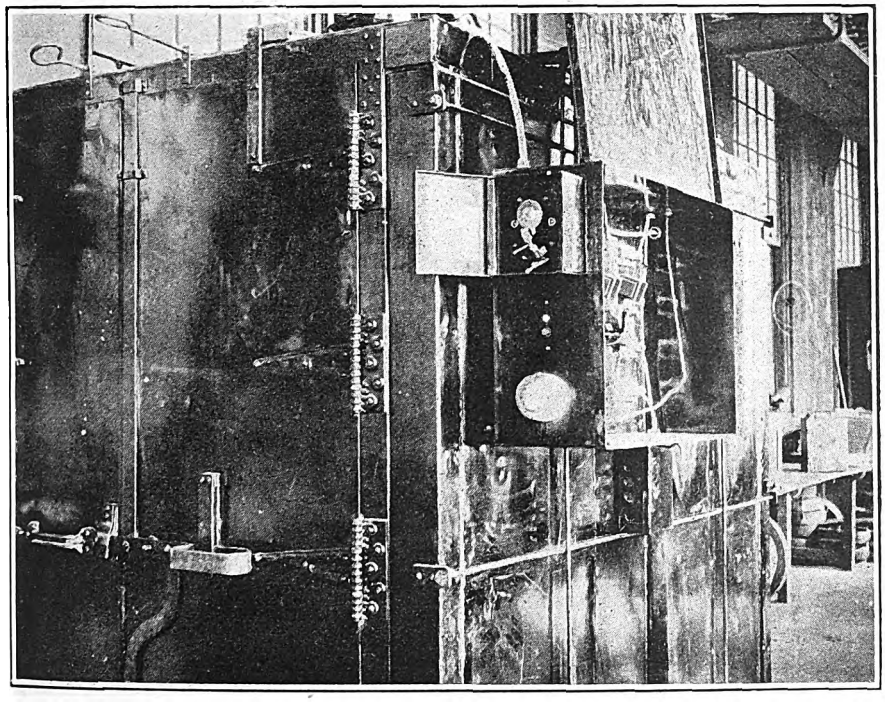
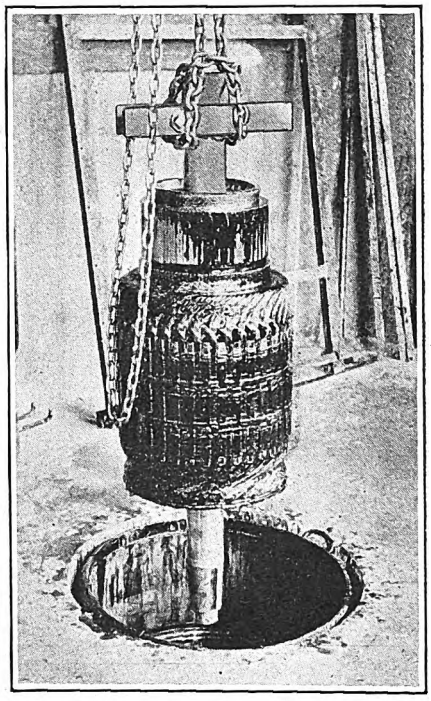
Pull-Ins Reduced 80 per Cent

By Installing Armature Dipping and Baking Facilities and by Changing the Kind of Waste Used in the Journal Boxes the Harrisburg Railways Eliminated the Cause of Many Breakdowns

DURING the past year the Harrisburg Railways, Harrisburg, Pa., has reduced the number of cars pulled in per month from 110 in January to 21 in November. The average car mileage per pull-in has been increased from 2,950 to 14,504. This improvement has resulted from three principal things. Breakdowns to cars in service have become less frequent since the practice of dipping and baking armatures has been undertaken. A change in the kind of waste used in packing journal boxes has reduced the number of hot bearings. A repair man is kept downtown at the square all day to make minor repairs and thereby save having to take cars out of service.





The Baking Oven Shown at the Left Has Been Installed in an Accessible and Well-Lighted Location. The Dipping Vat Shown at the Right Is Made of a Steel Oil Drum. Note the Portable Track Standing Against the Wall

Dipping and baking apparatus was installed in the armature room in April of this year. This location is particularly good because the room has a southern exposure and many large windows, making it sunny and bright. Moreover, it is readily accessible. A dipping vat has been made from a steel oil drum, which has been sunk below the floor. The position of the cylinder is vertical, with the top flush with the floor. Armatures are suspended vertically and lowered by a chain hoist into the liquid.

The electric baking oven, which was built by the Despatch Manufacturing Company, Minneapolis, Minn., is only a few feet away from the dipping tank and facing it. Its general appearance is shown in an accompanying illustration. After having been dipped, the armatures are placed on a carriage and rolled into the oven. Because the oven doors close tightly, with no opening in them for the rails on which this carriage moves, it has been found best to use a portable track which is laid down when the doors are open and is taken up before they are closed.

The armature carriage is a box made of sheet metal welded together and placed on wheels. It was built in the welding shop of the railway. Holes have been bored through the top and bottom to take the armature shafts. By this arrangement the armatures are held securely in place. A chain hoist by which armatures are raised from the dipping vat moves along a short track so that the armatures can be lowered directly onto the carriage. An important point in connection with the handling of armatures is the use of a copper lining band inside of the grips which are placed on the armature shaft. The use of this lining has proved efficacious in preventing damage to the metal of the shaft.

Automatic Temperature Control Has Been Provided for the Baking Oven

The baking oven has the usual thermostatic control and also a time control. The temperature range of the thermostat is about 2 deg. Field coils are baked at 220 deg. F. and armatures at 250 deg. F. A cut-out has been arranged so that when the doors are open the circuit is broken. The time control has been provided so that armatures or field coils can be left in the baking oven over Sundays or holidays when the armature repair man will not be on hand to turn off the current. This is so arranged that after a fixed temperature has been maintained for a certain length of time the clockwork mechanism automatically opens the circuit.

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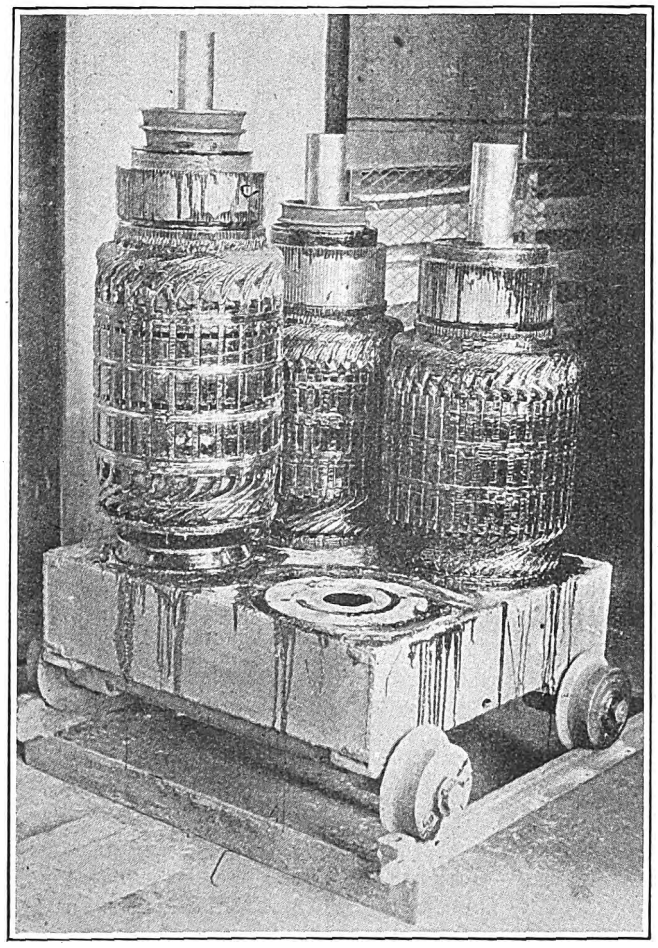
The installation of the dipping and baking apparatus is considered by the railway to have been instrumental in reducing the number of pull-ins. The monthly record shows how the average mileage per pull-in began to increase to a marked extent soon after dipping and baking was undertaken. Monthly figures are given in the accompanying table. December, it will be seen, was not quite so good as November, but in spite of adverse weather conditions was far better than the early months of the year.

PULL-IN RECORD OF HARRISBURG RAILWAYS FOR 1924

Month, 1924	Total Pull-Ins	Car-Miles per Pull-In.
January	110	2,950
February	110	2,770
March	93	3,302
April	*70	*4,536
May	62	5,376
June	78	4,055
July	46	6,950
August	55	5,714
September	55	5,545
October	47	6,755
November	21	14,505
December	47	6,821

*Dipping and baking facilities installed in April.

In the early part of the year it was felt by the management that there were too many failures to cars in service, and a careful investigation was undertaken to determine the cause of this situation. One of the causes of pull-ins was hot journals. For example, in



A Welded Armature Carriage Made of Sheet Metal Moves on a Portable Track

December, 1923, 89 cars were pulled in for this reason, and in January, 1924, the total number of hot bearings was 127, although there were not an equal number of cars taken out of service. High-grade lubricating oil and pure wool waste were being used by the company. Chemical analyses were made of the oil and waste. This was even carried to a point where the chemical characteristics of the dyes used in the wool were studied. No shortcomings, however, were found with either the oil or the waste.

During the investigation, A. F. Rexroth, master mechanic, visited a number of neighboring railway properties to study their methods of journal lubrication. On a trip of this kind to a property operating under conditions similar to those of the Harrisburg Railway, he discovered that extremely satisfactory results were being obtained with a comparatively low-grade wool waste. It was suggested that the 100 per cent wool used at Harrisburg was too high grade.

Accordingly, it was decided to try a different kind of waste containing only 60 per cent wool. This resulted in an immediate reduction in number of hot journals. Its use has been continued and the results have been most gratifying. The number of hot journals each month is shown in the accompanying table.

HOT JOURNAL RECORD, HARRISBURG RAILWAYS

Month, 1924	Hot Journals
January	127
February	*108
March	16
April	10
May	17
June	19
July	8
August	8
September	11
October	6
November	8

*Change made in quality of waste during this month.

After nine months experience with the new waste, the company has decided that pure wool waste is unsatisfactory for journal packing. Records show that in Harrisburg trouble was first experienced with this waste when it was about 60 days old. The supposition is that it became glazed on the surface and failed to carry the oil as it should. Moreover, the theory is held that pure wool waste is not as springy as 60 per cent quality and is, therefore, less satisfactory for journal packing.

A Shop Man Is Stationed Downtown to Make Minor Repairs

Another important step that has been taken to reduce the number of pull-ins at Harrisburg is the keeping of a repair man on duty at the square. At this location, the two principal loops in the downtown district touch and all cars pass this point once on each trip, except for those on a small line in the suburbs which do not come downtown at all. Stationing a repair man at the square, therefore, makes it possible to repair a car in service without pulling it into the shop, unless the defect is serious.

This man is on duty from 7 a.m. to 6 p.m., and the cost of keeping him there has been saved many times over through the elimination of dead mileage by pulling cars in and pulling out other cars to replace them. As the shops are nearly a mile from the central square, this saving has been very considerable. Moreover, there has been a corresponding saving in labor costs, since it is unnecessary to have shopmen take cars downtown to replace cripples and bring in the latter to the shop. As it happens, the one line which does not pass the square does pass right by the front of the railway shop, so that under the present arrangement every car on the system can be repaired on the road if the defect is a minor one.

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Proper Equipment Improves Babbitt Room Results

Convenient Arrangement of This Department in the Snelling Avenue Shops of the Twin City Rapid Transit Company, Together with Specially Designed Equipment, Insures Uniform and Speedy Work

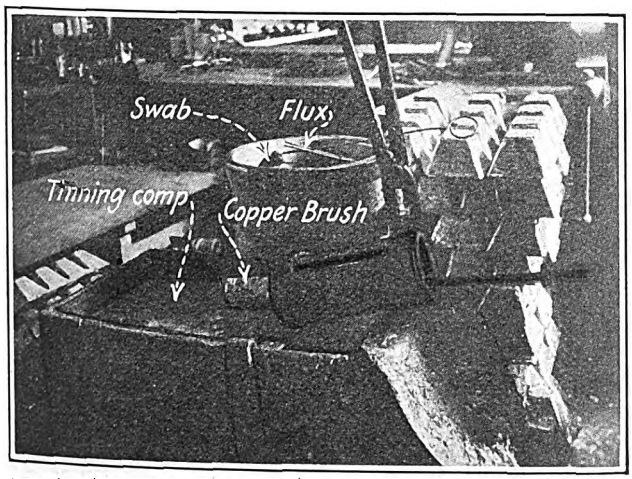
AS DESCRIBED in a previous article in the ELECTRIC RAILWAY JOURNAL for Nov. 15, page 834, both solid bronze and babbitt-lined malleable shells are used by the Twin City Rapid Transit Company mechanical department for axle bearings and babbitt-lined bronze is used for armature bearings. The babbitting department is therefore considered of equal importance with other shop departments where the machining operations are carried on, and considerable attention has been given to its equipment and arrangement.

Maximum convenience for carrying on the work has been the first consideration. The department is equipped with a number of low, cast-iron top tables, having these heavy tops supported on substantial steel legs. One of these tables extends across in front of the babbitting furnace as shown in the accompanying illustration, so that it is handy to the furnace and also to the tinning tank, which is near one end of the table.

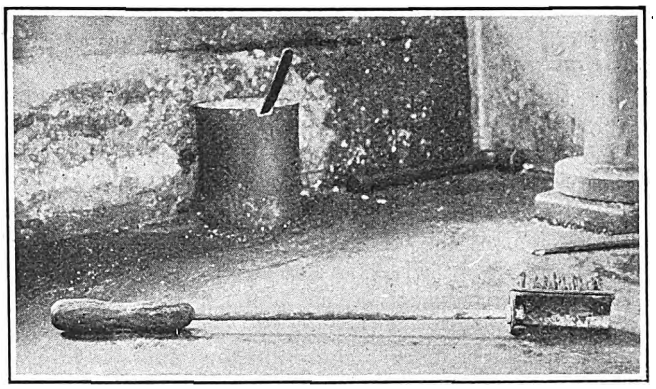
Malleable shells are tinned by using a special non-acid tinning flux which causes the tinning material to adhere properly to the malleable iron. The tinning material is half tin and half lead, and is put into a small rectangular tank set in a convenient location relative to the babbitting bench. A gas flame under the tank keeps the tinning mixture at the proper temperature. The bearing to be tinned is first preheated by immersion in the babbitt pot, either for removal of the old babbitt in the case of an old bearing; or for preheating only in the case of a new bearing. Old bearings seldom require very much tinning to be done before rebabbitting.

When a bearing does require tinning, however, it is set on the edge of the tinning tank as shown in the illustration, the projecting end being supported on a small cross bar, so that it slopes considerably, thus making sure that any surplus material will drain back into the tank.

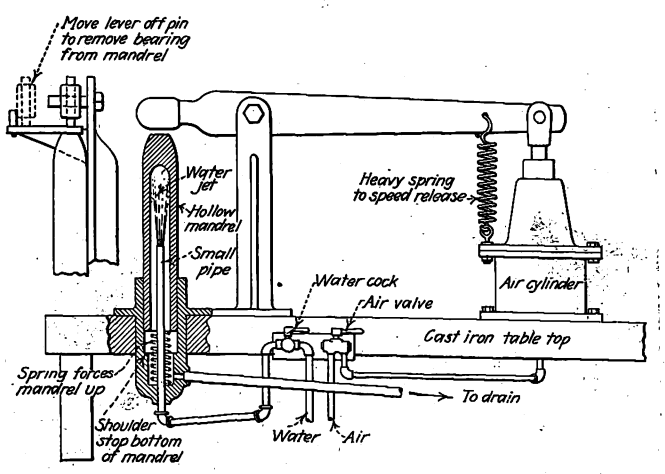
At the right of the tank, in an earthen pot, is the tinning flux. This is first swabbed on the interior surface of the bearing. An interesting item in connection with this operation, which at first glance may seem to be a very unimportant detail but which is sometimes a considerable source of lost time and annoyance, is the material used for this simple swab with which the tinning flux is applied. It consists of a piece of asbestos cloth fastened on the end of a small wire handle. This is the only material which has been found to resist the corroding action of flux and heat.



The Tinning Tank and Flux Are Located Convenient to the Babbitt Furnace and Work Bench. The Bearing Is Supported on the Edge of the Tank While Being Tinned



This Brush, Having Bristles Made of Twisted Copper Strands, Is Very Effective for Spreading the Tin on the Inside of the Bearing Shell



A Specially Designed Babbitting Machine Increases Production Over Hand Methods. The Mandrel Is Water Cooled and Is Released from the Babbitt by the Action of the Pneumatic Cylinder and Lever

Another interesting detail of the tinning operation is the method of applying the tinning material to the face of the bearing. The home-made copper brush, shown in another illustration, is dipped into the molten tin, by passing the long handle through the bearing. The brush is then repeatedly dipped into the tin and rubbed back and forth on the inside surface until the latter is thoroughly coated. The bristles of this brush consist of small twisted strands of fine copper wire, and as one of the brushes lasts for a long time, this method has been found to be much more satisfactory and rapid than that of using an iron to spread the tin.

After the tinning operation is completed the bearing is ready for babbitting. In the case of axle bearings, the babbitt contains a very much higher percentage of lead than for armature bearings. This is true only in the case of malleable-iron shells, of course, as the solid bronze axle-bearing shells are not babbitted. When babbitt is applied to the malleable-iron shells, its thickness varies from $\frac{1}{8}$ in. to $\frac{1}{16}$ in. In armature bearings the babbitt thickness averages about $\frac{1}{16}$ in.

A pyrometer is used in the babbitt pot to check the

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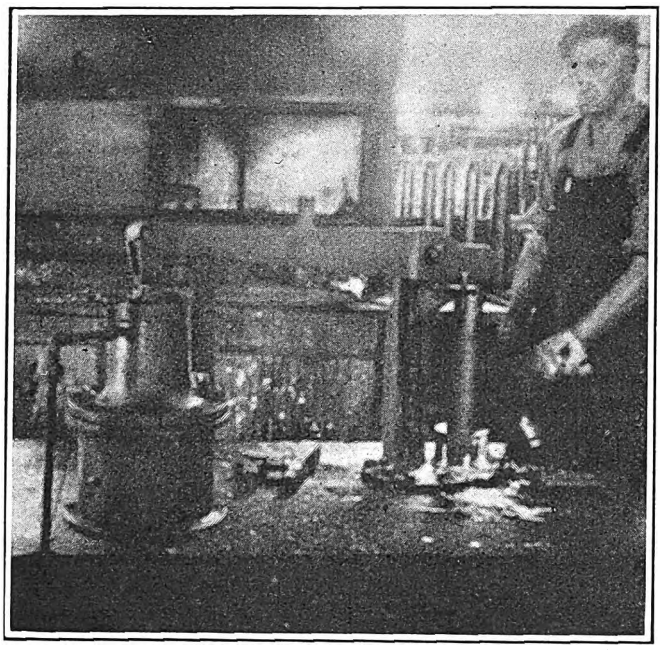
temperature, which is maintained at 650 deg. F. to 700 deg. F. Soft babbitt is heated to a temperature of only about 600 deg. F.

For the purpose of increasing the production in babbitting bearings a special machine has been designed, which employs a water-cooled automatic releasing mandrel. Accompanying illustrations show the design of this device. Near one end of the long table in front of the babbitt furnace is mounted an air cylinder and lever, which is supported over the end of the babbitting mandrel so that admission of air to the cylinder will force the end of the lever down on the mandrel. This mandrel itself is hollow, and fits into a steel casting set into the table as shown in the sketch. The mandrel is thus movable within the casting, and



Compact and Convenient Arrangement of Equipment in the Babbitt Room Eliminates Lost Motion and Time. The Babbitting Machine Is Mounted on a Low, Cast-Iron Top Table

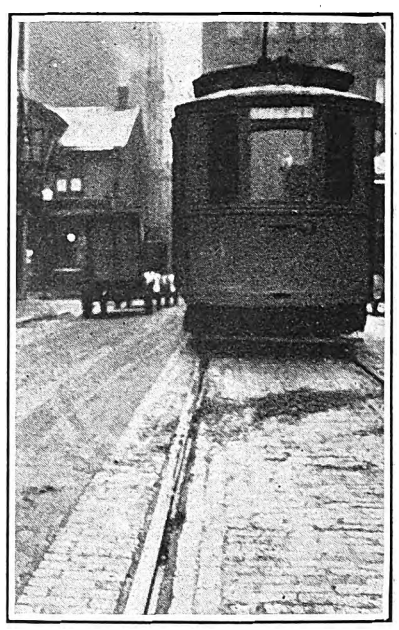
is supported on a spring at the bottom. When air is admitted to the cylinder the overhead lever forces the mandrel down in the casting and compresses the spring. A shoulder in the casting limits the distance that the mandrel can travel down. When the air pressure is released the mandrel is forced back into the normal position by the action of the spring.

Leading into the chamber from the bottom of the casting, and extending up into the hollow space inside the mandrel itself, is a small pipe by which a jet of cold water is introduced. A drain pipe leading out from the bottom of the chamber allows the surplus water to flow off. When it is desired to remove the bearing from the mandrel after it has been babbitted, or to replace another one on the mandrel, the lever is moved off the end of the supporting pin and allowed to rest on a short shelf until it is replaced on the pin again after another bearing has been put on the mandrel.

It is evident that this arrangement causes the babbitt to cool quickly after pouring, and the pneumatic device forces the mandrel loose if the babbitt sticks, and avoids any loss of time. With this arrangement, one man babbitts approximately 17 armature bearings per hour on general run work, including the time taken to melt out old babbitt on scrap bearings as well as those that are to be rebabbitted. When babbitting bearings only, one man easily completes 25 bearings per hour.

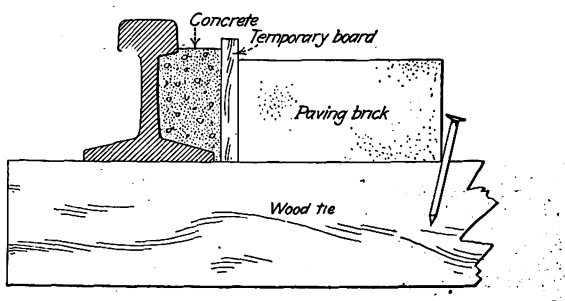
Concrete Curb Along Rail Reduces Paving Cost

AN UNUSUAL solution of a peculiar paving problem has been made by the Altoona & Logan Valley Electric Railway, Altoona, Pa. In the district where this company operates brick is used almost universally for paving the streets. Some time ago, however, the railway purchased at a bargain 600 tons of 5⅝-in. T-rail of special section with a deeper head than standard. As it was found impossible to place a 4-in. paving brick under the head of this rail to make a flangeway some other way of doing this had to be devised. The method finally adopted consists of placing what the company calls a "concrete curb" along the rail. This has not only solved the immediate problem, but also has reduced the cost of paving the railway area. The method of installing the concrete curb is as follows: After the ties have been laid and the rails spiked down a board 4 to 5 in. high is placed in a vertical position along the inside base of the rail. This is held in place by two or three paving bricks placed at intervals against it. The paving bricks in turn are held by nails driven part way into the wood ties, as shown in the accompanying sketch. As soon as the concrete has set, the nails, bricks and board are removed.



Appearance of Concrete Flangeway and Brick Pavement Used in Altoona

Two rows of brick stretchers are then laid along the



A Longitudinal Board Held in Place by Paving Brick Nailed Loosely to the Ties Is Used as a Form for Pouring the Concrete

inside of the concrete curb and grouted. On the outside of the rail brick headers are placed in the ordinary way. It is estimated by the company that this concrete curb cost about 7 cents per foot of rail. This is less by about 3 cents per foot than the cost of paving brick. Carefully constructed bolted joints are used by the railway, with special plates which were purchased at the same time as the rail. The plates are seam-welded and the bolts are spot-welded with the nuts on the inside. Having concrete alongside the rail instead of bricks makes it unnecessary to resort to special construction where the bolts project inside the rail.

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Inspecting Cars on Watt-Hour Basis

The Routine Followed and the Methods Used by the Philadelphia Rapid Transit Company Are Described—Meters Equipped with Three Inspection Dials Provide for Three Periods Suitable for Inspecting Various Parts of the Car Equipment

PASSENGER cars of the Philadelphia Rapid Transit Company have been inspected on a watt-hour basis for the past several years through the use of Economy watt-hour meters installed on the individual cars. The energy consumption has been calculated so that the inspection periods correspond quite closely to a mileage basis. The meters are equipped with three registration dials in addition to the regular registering dials for recording watt-hours to give the energy consumption record. These inspection dials are referred to as "A," "B" and "C." On 310 of the meters the three dials are calibrated to register 5,000, 15,000 and 30,000 kw.-hr. respectively. On all the other meters the dial indications per revolution are 3,000, 15,000 and 30,000 kw.-hr. respectively.

Each dial is equipped with two hands, one stationary and one traveling. The stationary hands are set in accordance with the average kilowatt-hour consumption per car-mile for various types of cars at each of the carhouse locations. The stationary hand can be reset to indicate on the dials the proportional kilowatt-hours consumed in operating a given number of car-miles for an "A," "B" or "C" inspection.

The factor for reducing kilowatt-hours per car-mile to obtain car mileage will necessarily vary with lines, but in order to provide a uniform basis for each of the 15 inspection shops, an average of the car lines operating from each particular shop is obtained. Thus, if there are five lines operating from a shop, the factor chosen for reducing kilowatt-hours per car-mile to car-miles is the average of the five lines. The variation from the definite mileage inspection as used is less than 5 per cent. In order to make sure that operating conditions are taken care of and that the constant used

Form 7140—Revised 1-5-24

Car No. .....
"A" Inspection .. .. Miles
"B" Inspection .. .. Miles
"C" Inspection .. .. Miles

PHILADELPHIA RAPID TRANSIT COMPANY
ROLLING STOCK AND BUILDINGS DEPARTMENT

Car-House No. ..... Total Miles Traveled ..... Type Motors

REPAIR SYMBOLS

AG	—Armature Grounded	WT	—Wheels Turned
AS	—Armature Shorted	WC	—Wheels Changed
AB	—Armature Bearings	S	—Kensington Shop
ASB	—Armature Shaft Broken	Pa	—Painting
FG	—Field Grounded	C	—Collision
FLB	—Field Lead Burned	PI	—Pull In
O	—Trucks Overhauled	PS	—From Shop
P	—Pinion		

DATE	STATEMENT	MILES	INSP.		STATEMENT	MILES	INSP.		STATEMENT	MILES	INSP.		STATEMENT	MILLS.	INSP.

Form 7094—Revised 1-5-24

PHILADELPHIA RAPID TRANSIT COMPANY
REPORT OF CARS PULLED IN

Car-House No. ..... Date 192

CAR IN	CAR OUT	ROUTE No.	BLOCK No.	TIME	TYPE MOTOR	TROUBLE REPORTED	TROUBLE FOUND

actually represents the character of service from a particular depot, a check is made about three times per year.

The system is working very satisfactorily and is more convenient than the mileage system formerly used. One clerk takes care of the necessary records, so that no additional force is required over that previously used when the mileage basis was employed. The number of cars which come in for inspection each day is quite uniform, and little trouble is experienced from cars being bunched one day with very few the next. The uniformity is shown by the accompanying table of total inspections for the month of August.

All surface cars, with the exception of old equipment, are inspected according to a schedule designated as *A*, 500 miles; *B*, 2,500 miles, and *C*, 7,500 miles.

Spotting Cars for Inspection

After an inspection has been made the carhouse foreman or his assistant unlocks the resetting device on the meter and turns the traveling hand back to zero. Meters are inspected each night by car placers. On Form 7126, designated as "Daily Report of Cars Inspected by Meter Dials," the car placer each night enters carhouse number, date, serial numbers of cars due for inspection, and inspection letter, this being determined from the position of the traveling hand relative to the stationary hand on the inspection dial. Such cars as are found to be due for the various inspections are blocked in the carhouse so that they will be held for inspection the following day, or if necessary they may be operated as morning rush trippers.

The night foreman must make out a work sheet for each man in the crew. This sheet is ready for the men when they start work in the morning and it must be signed by the men and turned into the carhouse office at the end of each day. The carhouse clerk transfers the data to individual car record cards, designated as Form 7140. The foreman or his assistant must personally check all cars due for inspection, reset the dial hands to zero and take a statement of the meter on each car.

The carhouse clerk enters the meter reading in the column under "Miles" and subtracts the previous meter reading from the last reading, which gives the total kilowatt-hours consumed since the last inspection, which in turn is divided by the kilowatt-hours per car-mile which has been determined for that class of car at this particular depot. He then enters the miles that the car traveled for that inspection under the present meter reading. Form 7126 is filed away for 60 days and then destroyed. Form 7140 is kept in the carhouse office in the active file until both sides of card have been filled. It is then transferred to an inactive file, where it can be referred to whenever it is desired to determine what troubles a car has shown or for checking mileage of any particular piece of equipment.

The type of inspection used includes first the class "A" inspection, made every 500 miles, which in Philadelphia runs between 4 and 5 days. When a car comes in with the meter dial indicating that it is due for class "A" inspection, the car placer turns this over to the inspection force, repair crew, or cleaning crew, as is necessary. The inspection made consists of the examination of all parts to make certain they are in good condition and for the replacement of pins, cotters, screws, and the like which can be done quickly. Details of work done follow:

Class "A" Inspection

Trolley—The trolley wheels are gaged, and if they have reached the condemning point they are replaced. Bushings, contact springs, washers, pole, trolley stand, trolley lead, rope and catcher must be inspected, repaired if necessary and all worn parts replaced. A drop of engine oil is applied to trolley contact washers and stands and catchers are lubricated. The trolley rope must be of sufficient length for the pole to reach 23 ft. high.

Controllers—Controllers are inspected for broken or worn-out fingers and segments, which are replaced where necessary. All old grease must be wiped from the contacts. Fingers are adjusted to give ⅛ in. pick-up to the finger. All dust and dirt are brushed out of the controller with a special brush, and the controller is thoroughly inspected for blisters and burns on the controller cylinder or the base of the fingers. These are filed and thoroughly cleaned. If necessary a very thin coating of shellac is applied to the parts where carbonization has been found. The deflector boards are scraped and brushed to remove the copper dust. Controller segments are lubricated with vaseline or petroleum jelly. Bearings are oiled and the tops of controllers are cleaned of all dirt and grease. In general the controller must be placed in such a condition that it will give no trouble before the next inspection.

Brakes—Brake inspection consists of inspecting the entire brake rigging, on both body and trucks. If shoes, pins or levers are worn they are replaced, as well as any other part worn to a condemning point. Loose bolts are tightened.

Slack adjusters are inspected carefully and the brakes are applied and released several times to determine if the slack adjuster is functioning properly. If not, it is removed and replaced by one in good order. On cars equipped with solid turnbuckles, manual adjustment of brakes is necessary and the inspector places a pinch bar at least 5 ft. long with one end under the transom iron of the truck and the other end against the brake beam. He then puts his weight against the end of the bar so as to force the beam away from the wheel. With proper adjustment, he will then be able to shake the shoe in the holder with his fingers. This is done on each wheel of the truck. The same procedure is followed on cars equipped with slack adjusters.

The inspector checks air pressure to see that it stands at a minimum of 65 lb. and a maximum of 75 lb. If he finds a variation of pressure he reports it to the foreman or his assistant. Side bearings are lubricated with one part reclaimed compressor oil and two parts of track oil, applied with a 1½-in. brush.

Fenders—All fenders are tripped from the platform with the plunger and with the tripping gate. They are also reset from the platform to determine if they are in good working order. Fender parts, including tray and trip gate, are lubricated and any worn or broken parts are replaced.

Glass—All broken glass is replaced, while cracked glass is replaced only when the foreman or assistant foreman finds it necessary.

Window Catches—Window catches on green cars are thoroughly inspected, and where found defective they are replaced with good-order catches.

Seats—All seats are thoroughly inspected, particular attention being given to castings of side supports, broken slats and protruding nails. Defective seats are repaired or replaced.

The foreman or his assistant then inspects the entire car to determine if proper inspection and repairs have been made.

Class "B" Inspection

The inspection work of all parts as listed under the class "A" inspection is repeated on the class "B"; in addition the following work is done:

Motors—All worn-out or chipped brushes are replaced and the brush springs are inspected for weakness or breakage, commutators are inspected for flash-over. The brush-holder yokes on motors equipped with old-style yokes are thoroughly inspected for a deposit of carbon dust or carbonization. Brush-holders and yokes are wiped clean on motors without brush yokes,

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insulators are wiped clean, and the inspection of holders is carried on in the same manner as outlined above. The armatures are inspected for low bearings, and if any are found they are reported to the foreman or his assistant.

Field coils are inspected carefully and gears and pinions are tried for looseness and are lubricated. On the GE-80 motors the waste is raised and the piece of waste resting next to the armature shaft is replaced by a fresh piece and free oil is placed on top of the waste. On all box-frame type motors the oil is not applied to the waste, but is poured into the well that is provided in the motor end housing, which allows the oil to go down into the waste at the bottom of the well, and the capillary action of the waste takes the oil from this reservoir to the armature shaft. All motor leads and cables are inspected and repaired where necessary. All dirt accumulations around the edges of trapdoors are removed so that the trapdoor in the car floor fits properly. Motor bolts, including axle cap, gear case, armature bearing and suspension bolts, are tried for tightness. Axle bearings are examined for wear and those found worn to the scrapping point are replaced.

Lightning Arresters—From April 1 to Sept. 1, lightning arresters are thoroughly inspected on "B" inspection. During the winter, arresters are cleaned on "C" inspections, and those of the adjustable type are adjusted according to a gage furnished for this purpose.

Sanders — All sander parts are thoroughly inspected and repaired or replaced where necessary, to allow proper functioning. Sand hose is inspected for leaks. The ends of hose must be in proper alignment with the rail to make certain that sand will drop on the rail when applied.

Doors and Steps—All doors and steps are inspected and adjustments are made where necessary. Where required all moving parts are lubricated. Doors operated by pneumatic engines have all surplus grease wiped from the engine as well as from underneath, to prevent grease from dropping into the car. All pneumatic doors must open and close in 4 seconds. Door engines must cushion properly. Door control rods and handles are kept clean at all times by men assigned to work on doors.

Engineer's Brake Valve—Engineer's valves are inspected and if not working freely K-000 grease is applied. The engineer's valves and pipes connected to them are kept clean at all times by men who are assigned to work on air equipment.

Gongs—Gongs are inspected and tested to see that they operate properly and that all parts are tight. They must be so adjusted that they can be operated with either toe or heel. Lubricant is used where necessary.

Rheostats—All rheostats and tubes are inspected for looseness and to make certain that no loose or warped resistance grids exist. Leads must not foul underframing. Defective rheostats are removed as a unit and are sent to the shop for repairing.

Circuit and Line Breakers—The circuit and line breakers are examined and brushed out and all worn parts are replaced.

Air Governors—Air governors are inspected as to condition of contact points and for parts that show wear, worn parts being replaced where necessary. The adjustment must be correct so they will cut in at 65-lb. and out at 75-lb. pressure.

Air Compressors—The air compressor motor is examined for condition of commutator and brushes and is lubricated if necessary. This is done by removing the plug from the oil pipe. If the oil is level with the top of the plug hole, no oil is added. If below, enough oil is poured in through the plug hole to bring it level with the top of the hole. Air vents under the front head and directly under the compressor are cleaned.

Emergency Jacks—Jacks are raised and lowered to see that they are working properly and a drop of oil is applied to the working parts. When found defective they are replaced and the defective jacks are sent to the shop for repairs.

Switches—All switches, including air, light, drum, headlight and auxiliary circuit, are inspected to see that they are working properly. If defective they are replaced.

Couplers—The Tomlinson couplers, carriers and radial bar slides are inspected to see that they are working properly and are lubricated if necessary.

Trolley Catchers and Retrievers—Where bad-order trolley catchers are found they are replaced and the defective ones are sent to the shop for repairs.

Heaters—During the winter months heaters are inspected for defective coils and switches. If coils are found defective the heater is removed as a unit and sent to the shop for repairs.

Head and Tail Lights—All electric head and tail lights are cleaned thoroughly.

Hand Rails—All hand rails except those treated with enamel are painted, together with all malleable-iron window-wiper castings.

CLASS "C" INSPECTION

When a car is due for "C" inspection, the foreman or his assistant makes a very detailed and minute inspection of all car parts. Wherever any part is found worn or in need of replacement he marks that part with a piece of chalk so that the inspection crew will see it readily and make repairs. The carhouse clerks check all cars on "C" inspection to determine the proper setting of meters. The trolley inspection is the same as that outlined under "A" inspection, but in addition the stand is inspected more carefully for wear and is replaced if necessary. The pole and stand are painted with asphaltum paint if necessary, and the tension of the trolley stand is measused with scales provided for this purpose. The tension of the trolley pole is adjusted to 25 lb. with the trolley wheel 17 ft. from the ball of the rail on all cars, except on the pay-within type, on which it is adjusted to 30 lb.

Controller, Circuit and Line Breaker Inspection is the same as outlined under "A" and "B," with the exception that these three pieces of apparatus are blown out with compressed air and all parts damaged by flash or carbonized are thoroughly cleaned and painted with very thin shellac.

The line breaker cover is thoroughly cleaned with a wire brush and painted on the outside with black asphaltum, as a rust preventive. Fenders are inspected the same as for "A" inspection and sanders the same as for "B" inspection. The brake inspection, as far as adjustment and inspection of the apparatus is concerned, is identical with that outlined under "A" inspection, with the following exceptions:

Brakes — All worn brake-hanger slides and guides are replaced, the piston in the air cylinder is turned one-quarter turn to distribute the wear on the leather, slack adjusters are removed, cleaned, packed with grease and replaced. When worn, they are sent to the shop for repairs. All levers, including body, upright and connecting rods, are removed from the car, thoroughly cleaned and all parts are inspected for wear. All brake pins and levers are lubricated with journal oil, track oil being used only on the side bearings.

Trucks—Journal boxes are examined to see that the waste has not worked away from the journal; if found away it is pushed back into place. At the discretion of the foreman or his assistant, if the waste looks dry, or the journal gives any indication of excessive heating, the journal box is repacked. The journal bearing brasses are inspected and if the condemning point has been reached they are replaced.

All truck parts are inspected for loose bolts. These are tightened or replaced, and if any cracked or broken parts are found they are replaced. The car body is raised sufficiently to allow oiling of center bearings and side bearings of the slide type. Drawbars and couplers are inspected for wear and the radial drawbar slide on Tomlinson couplers is lubricated so that the carrier moves freely.

Motors—The motor inspection is carried out the same as outlined under "B" inspection. In addition, dirt is blown from motors by means of compressed air. Brush-holder tension on all motors is tested and the tension is adjusted on all adjustable brush-holders to the company's standard, information regarding which is provided on separate sheets.

The waste in armature and axle bearings on modern-type motors is turned so that fresh waste rests against the armature shaft or axle. On old-style motors, the waste is withdrawn and a fresh piece is placed next to the shaft. All oil-box lids are examined and any that are loose or missing are repaired or replaced. Clearance between the axle bearing head and axle collar is checked, with the motor

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forced against the gear. If the bearing heads have worn so that the clearance between axle bearing and axle collar is greater than ⅛ in. the axle collar is reset so that the clearance is less than that amount. If at this inspection any motor leads are found to have been connected with two-way connectors due to making temporary repairs the motor leads are replaced. The waste removed from the armature bearings on this inspection is examined by the foreman or his assistant, to determine whether it can be used for axle or journal boxes.

Doors and Steps—The door and step inspection is carried out in the same manner as outlined under class "B," excepting that the pneumatically operated doors are timed to determine that they open and close in 4 seconds.

Air Equipment—Engineer's brake valves are inspected in the same manner as outlined under class "B" inspection. The air compressor also is inspected and oiled in the same manner as under "B," with the exception that before the brush-holders and brushes are cleaned, the dirt from the motor is blown out with compressed air. The air governor inspection is the same as outlined under "B." The emergency valves, such as are used on the SK and SPC type cars, are examined and operated to determine that they function properly. If any of these valves are found to be in bad order or working sluggishly, the valve is removed from the car, a block is bolted to the open end of the valve to keep out dirt and it is then sent to the shop for overhauling and repairs.

Fuse Boxes—Fuse boxes are inspected to determine if the binding screws and wedges are functioning properly and all dust is blown from them with compressed air. The lids must be in first-class condition. After cleaning, fuse boxes are painted with insulating varnish, both inside and outside. A drop of oil is put on the binding screws and the leads in the rear of the fuse box are painted.

Car Body—All seats are inspected as to their condition, and particular attention is given to broken or cracked castings in the side supports. Seats must be fastened accurately to the wall and floor. All torn and broken seats or seat backs are replaced. Car-body fixtures as a whole are carefully inspected, including emergency jacks. Jacks must be raised and lowered. If a jack functions improperly, it must be replaced with a good-order jack and the defective one sent to the shop for repairs.

In addition to painting the hand rails and window wipers, the headlight and bumper are painted with asphaltum paint. All switches, including air, light, heat, drum and those of auxiliary circuits, are examined and are put in proper working order, by repairing or replacing. Broken or cracked glass is replaced. The register is removed, inspected, and lubricated. Any defective register backs are replaced and the defective ones sent to the shop for repairs.

On cars which are operated in trains, a careful inspection is made of the bus-line jumpers and couplers to see that they are in good order, also that the bus-line jumpers are provided with standard supporting springs and latches.

The air governor is cut off and the air pressure allowed to increase to determine whether the pop valve will open at 90 lb. If it does not, the valve is sent to the shop for repairs and is replaced with a good-order valve. No car is allowed to operate with a pop valve functioning improperly. The emergency valves on all types of cars are cleaned thoroughly and then are tried to determine if they function properly.

After each inspection is finished the foreman or his assistant makes a very careful examination of all work that has been done to see that it has been properly executed. He then signs the car inspection sheet, Form 7126.

General Inspection

A number of items require less attention than at any of the regular periods. These are covered in a general inspection in addition to regular inspections. Several of these are mentioned in the following paragraphs:

Journal boxes are repacked as follows: Curtis D-2, Brill 27 (old type), Brill 39-E and Brill 43-E pony journals on every third "C" inspection, or 22,500 miles. The Brill 39-E driver, Brill 43-E driver, Brill 77-E, Brill 79-E and Brill 27 (new type) journal boxes on every fourth "C" inspection or 30,000 miles. Waste is removed from the journal boxes and if found in good order it is reclaimed. Bad waste is thrown away.

Wheels are inspected for wear and for bad-order flanges by the assistant foreman the first of every month and a record is kept of wheels to be changed. The armature and axle bearings are repacked at the same time as the journals. Waste removed from the armature bearings is used for repacking the axle bearings after taking on particles of waste, hardened or filled with dirt. Whenever a new journal brass is installed the brass on the other end of the axle must be of the same thickness as the new one. A tolerance of ⅛ in. is allowed.

Circuit and Line Breakers.—Every 6 months the circuit and line breakers are tested with a water barrel resistance. On all two-motor cars the breakers are set to open at 300 amp. as shown on an ammeter, which is in circuit with the water rheostat. On all four-motor cars they are set to open at 350 amp.

When line breakers are checked as to setting on cars equipped with PC control, the relay is examined and adjusted so that when feeding, the relay will not allow the controller to operate rapidly enough to blow the line breaker before the car has accelerated to maximum speed.

Overhauling

When trouble is found which necessitates the removal of the car to the overhauling bay for changing wheels, armatures or any work which requires the raising of the body, the assistant foreman in charge of overhauling makes out a detailed report. Such work as is done in the overhauling bay must be indicated on this report, which is then turned into the carhouse office. On Form 7140 are shown repair symbols which are used for entering the repair data on the card in the column "Repairs." For example, when a shorted armature is changed in the shop the number of the motor has AS written back of it. If this trouble repeats, the fields are tested with a Century field tester. Low resistance fields are removed. The recording of all work as shown by the repair symbols on the car record card is entered in the same way as the work is done in order that a continuous check on the performance of the equipment may be had at all times. Whenever wheels are installed the symbol WC is placed back of the number of the set, and the word "new" or "returned" is written in the column under repairs, so that the number of miles traveled by a new wheel or a returned wheel can be determined from the cards.

Pull-Ins

Form 7094 is used by the Philadelphia Rapid Transit Company for pull-ins. Whenever a car fails in service and is pulled in, the number of this car is entered in the column "Car In" and the number of the car taken out is entered in the column "Car Out." The route and block number of the car that is pulled in and the type of motor with which the car is equipped are entered in their respective columns, together with the time the pull-in was made. The trouble reported is entered on the card exactly as reported to the carhouse foreman by the transportation department, at whose request the car was pulled in, and the exact trouble found is written in the column headed "Trouble Found." If the car is found to have trouble other than that for which it was pulled in, the exact trouble found is written on this sheet. Each day the foreman fills in the report

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of cars operated, etc., in the section shown at the lower left-hand corner of the pull-in sheet. This shows the total number of scheduled cars and wildcats operated, also the number of surplus O.K. cars, short of schedule, disabled for carhouse, disabled for shop, at shop for repairs and at shop for paint. This information is entered each day and is carefully totaled to show the total assignment of cars at the particular depot making out the form. The day foreman signs this sheet above the line at the lower right corner. When completely filled out in duplicate the original is sent to the general office and the carbon copy is retained at the carhouse. The clerk at the carhouse transfers the pull-in information from this sheet to the car card,

RECORDS OF TOTAL CAR INSPECTIONS FOR PHILADELPHIA RAPID TRANSIT COMPANY, AUGUST AND SEPTEMBER, 1924

Day of Month	August Inspection Class* "A"	"B"	"C"	Total	September Inspection Class* "A"	"B"	"C"	Total
1	241	53	29	323	172	38	11	221
2	240	49	22	311	247	58	27	332
3	188	51	22	261	261	65	30	356
4	214	54	37	305	227	55	32	314
5	228	64	39	331	241	59	32	332
6	225	60	41	326	221	46	25	292
7	224	64	27	315	196	37	26	259
8	253	51	30	334	243	52	28	323
9	226	53	27	306	238	59	28	325
10	195	43	14	252	253	58	20	331
11	228	46	27	301	229	54	18	301
12	282	44	29	355	245	66	23	334
13	234	55	27	316	222	47	24	293
14	222	49	34	305	204	54	13	271
15	261	39	32	332	231	46	37	314
16	236	52	34	322	271	66	34	371
17	203	41	17	261	240	74	30	344
18	229	42	30	301	250	47	32	329
19	269	45	34	348	256	69	25	350
20	235	65	38	338	220	71	18	309
21	233	41	26	300	218	49	15	282
22	237	64	28	329	252	52	25	329
23	252	33	21	306	261	50	23	334
24	208	45	18	271	259	55	19	333
25	221	46	38	305	243	59	21	323
26	265	47	31	343	288	71	19	378
27	245	55	25	325	238	53	28	319
28	238	59	32	329	234	53	13	300
29	235	63	27	325	204	52	29	285
30	220	50	20	290	224	62	22	308
31	182	44	19	245	....	....	...	....
	7,169	1,567	875	9,611	7,088	1,677	727	9,492
Aver. per day....	232	50	28	310	236	56	24	316

*"A" inspection 600 miles; "B" inspection 2,400 miles; "C" inspection 7,200 miles. The inspection schedule was changed Nov. 4, 1924, to "A" 500 miles; "B" 2,500 miles; "C" 7,500 miles.

Form 7140, using the appropriate abbreviations, so that if a car is pulled in for the same trouble, such as bad brakes, twice in succession, the clerk will report this to the foreman. All pull-ins are treated in the same manner.

On entering the pull-ins on the car record sheet it is possible at all times for a foreman to know and to be able to check who did the work on the car that failed on the street.

Whenever any car parts are put on test by either the testing division or the shops, the part of the apparatus that is on test is entered on the particular car record card. Whenever a part on test shows weakness, wear or breakage, it is reported immediately to the office of the test engineer and the part is held for his inspection.

Whenever a storm occurs, regardless of what nature, the night foreman assigns a man to lubricate all slides on the slide-type doors which are exposed to the weather.

Material for Repairs

All parts removed from cars that require shop repairs are tagged properly, giving the nature of the defect and the depot number.

On or about April 15 of each year all snow equipment is cleaned and inspected prior to summer storage. A report is submitted by each carhouse foreman to the general carhouse foreman itemizing snow equipment defects that require shop repairs. Motor lids and inspection plates are removed from all non-ventilated motors, and these are stored for replacement during winter months. Window slides on all cars except those equipped with metallic posts are greased with "Smoothene." On cars with metallic posts the slides are wiped with turpentine.

On or about Sept. 15 repairs are made to all car heaters and the inspection of snow equipment is started so that it will be in good operating condition by Nov. 1. On Dec. 1 motor lids and inspection plates are reinstalled on all non-ventilated motors.

Special Corps Repairs Fare Boxes

Branch of Traffic Department, Organized in St. Louis and Known as Defective Fare Box Department, Is Responsible for Keeping Fare Boxes in Good Condition

BY THE plan of organizing a special department for the examination and repair of defective fare boxes, the United Railways of St. Louis, under the supervision of its general traffic department, has perfected a system for handling fares which has greatly reduced its losses from theft.

The United Railways installed registering fare boxes on its cars in December, 1918. During the following three years there were discrepancies in the registration of fares which resulted in controversies between conductors, superintendents, and other officials. This led to the organization on Feb. 1, 1921, under the direction of the traffic department, of a "defective fare box department," which has almost entirely eliminated claims against the company.

Naturally, anything of a mechanical nature will get out of order and show defects, because of rough usage, wear of parts, or lack of attention as to cleaning, etc. In addition, in the case of fare boxes, there is the danger over which conductors have no control that passengers will place in these boxes mutilated coins and foreign substances of all sorts, which frequently put the boxes out of commission.

Defective Box Replaced as Soon as Possible

When a conductor discovers that his box fails to work properly, he is permitted to allow passengers to deposit their fares as usual, but he makes no attempt to register these fares with the registering device of the box. He then must communicate as quickly as possible with the nearest station, through a supervisor or such other official as he may pass en route to the station. When he arrives at this point, the defective box is removed and a new box is placed on the car. The defective box is immediately tagged with the form shown in the first reproduction. The signature called for on this tag is that of the person removing the box. On the reverse side of this tag there are the following blanks: Run number . . . , line . . . , badge number . . . , telltale.

The responsibility for the box, after it has been taken off the car, is with the superintendent of the

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division, and it is placed in special storage and is not disturbed by any one until the following day.

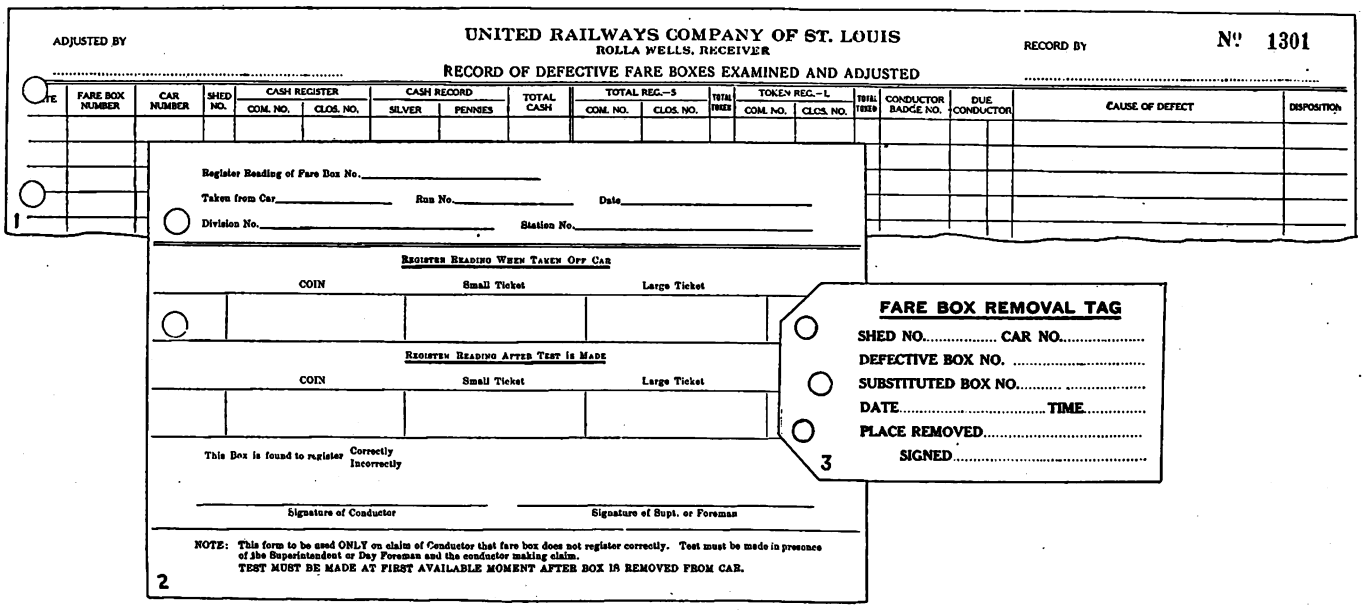
Each day there is an automobile service to outlying stations for defective fare boxes by representatives of the defective fare box department. On this trip the defective boxes are changed for boxes in good order, and a receipt is given and taken for boxes delivered and received on special forms provided for this purpose. Defective boxes are then carried to a special office adjacent to the headquarters of the traffic department. Here they come under the attention as to their defects by mechanics who, for this purpose, are under the direction of the traffic department. As each box is opened, a representative of the treasury department is present and a proper record is made of the contents of the box on a form provided for this purpose. This shows the amount due to the conductor according to the register and the amount due to the company as not having passed through the register.

The defects in the box are then corrected and a careful record is kept of what has to be done to each box, together with the box number, car number, number of conductor in charge, and cause of defect. A cross-file is kept of the conductors sending in defective boxes. This system has reduced to a minimum the use of trick coins.

Checks Made of Registering Mechanism

The defective fare box department not only cares for boxes which become choked up or otherwise obviously are out of order, but also cases where the conductors claim that a box is registering more than it should and that he is consequently entitled to a refund. In cases of this kind, the procedure is for representatives of the defective fare box department to test the box out in the presence of both the superintendent or foreman of the station and of the complaining conductor, when he is off duty. The test consists of running through the box a certain number of coins, as specified in instructions drafted for this purpose, and the result of the test is recorded in the third blank illustrated. As will be noticed, this blank provides space for the signature of the superintendent or foreman and also for the signature of the conductor. The blank is then forwarded to the transportation department and shows that the box either registered correctly or incorrectly. This system was begun on May 1, 1922.

As an illustration of the effectiveness of this inspection, during the month of July, 1924, the transportation department had seventeen claims of defective boxes, and of this number only one claim was allowed. Altogether on this system, the company has about 1,700 registering fare boxes, and the average number found to develop trouble of some kind each day is about 20.



Forms and Tag Used by United Railways of St. Louis in Handling Fare-Box Repairs

No. 1. Record kept of contents of defective fare boxes and adjustment required to put them in good condition.

No. 2. Form used to record result of the test when conductor claims that fare box does not register correctly.

No. 3. Tag attached to defective fare box when removed from car. It is signed by the man removing the box.

It may be added that the company has found a system not only valuable as a rapid method of detecting and correcting fare boxes, but it has also been of great benefit to the employment and record department in its work of keeping tab on conductors.

Railway Edition of Pittsburgh Guide Published

THE 17th edition of Lewis' Pittsburgh Guide is known as the Pittsburgh Railways Company edition. Besides the usual list of public buildings, theaters, banks, monuments, charitable institutions and the like, the guide contains a complete list of all the routes operated by the Pittsburgh Railways, together with the route numbers and headways. At the bottom of each page are printed a few words telling the advantages of using the railway. The route numbers of the car lines to take to reach any point in the city are shown in the list of streets and house numbers.

The railway has purchased 5,000 copies at a cost of $2,500 for distribution to its motormen and conductors and to the traffic policemen in the city. The remaining 80,000 comprising the issue will be sold at news stands and book shops.

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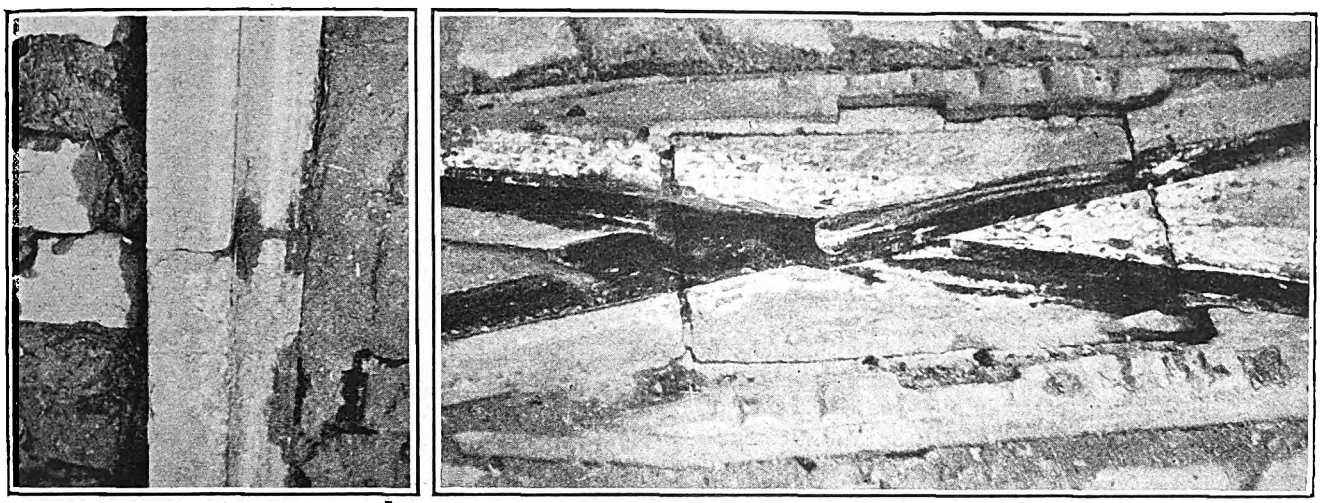


At Left, Cupped Rail Repaired by Adding New Material with an Arc Welder. At Right, Manganese Cross-Over Points, Built Up by Arc Welding. Such Repairs Have Stood Years of Service

Maintenance Repairs by Welding

Methods of Filling in Cupped Track Joints and Making Repairs to Corrugations—Costs Given for Various Repairs to Rolling Stock by Welding

By J. F. LINCOLN
Vice-President and General Manager Lincoln Electric Company, Cleveland, Ohio

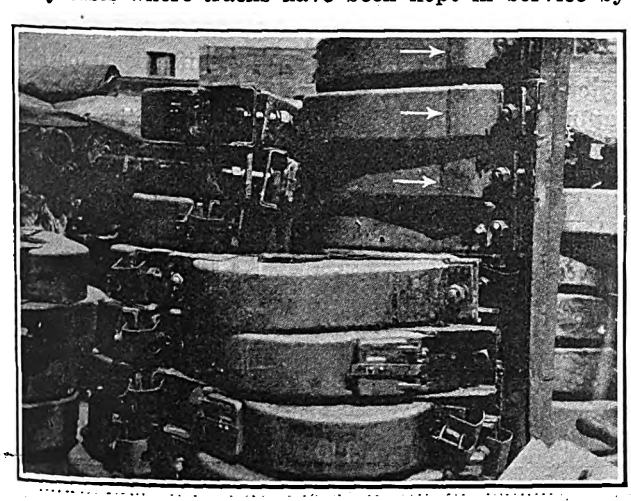
THE passing of car wheels from one rail to the adjacent one, where cars pass in one direction only, pounds out a cup on the second rail. This results from a breaking down of the roadbed, so that it gives an insecure foundation for the joint. The constant pounding soon loosens the bolts which hold the fishplates, and the jar from passing cars becomes more severe. When such a cup has been formed, it is necessary either to take out the rail and install a new one or to repair the old rail by welding. Where the track is in bad condition and all rails are well worn, the introduction of a new rail is not desirable as conditions cannot be made satisfactory. In such cases the usual procedure is to take up all the track where the trouble occurs and re-lay new rails. The expense of doing this is, of course, very high. For such cases it will be readily appreciated that welding offers a considerable saving and there are many cases where tracks have been kept in service by the use of the arc welder for three of four years in addition to the ordinary life of the track.

When once a rail begins to show corrugations its deterioration is rapid. Therefore it is advisable to make repairs as soon as possible. The metal electrode process has been found quite satisfactory, and after metal has been filled into the various grooves the high spots may be ground off with some form of grinder.

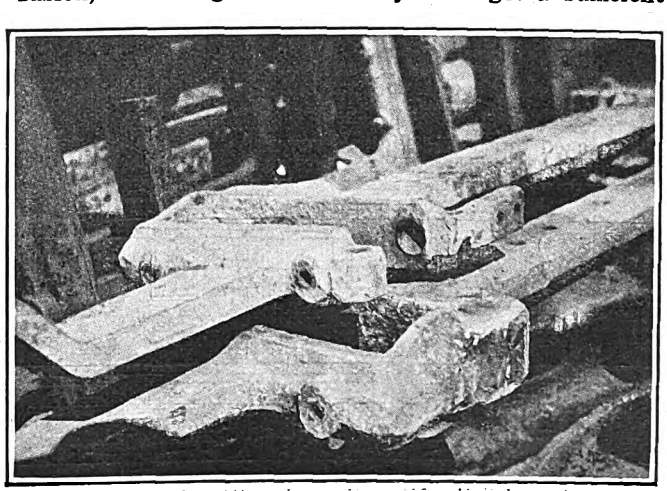
In grinding, some companies use only a reciprocating grinder, while others use both the hand and reciprocating types. The reciprocating process seems to be preferable because it is more economical. The rate of grinding with a hand grinder is rather low and where the filled-in section is considerably higher than other parts of the rail, an excessive length of time is required to bring it down to proper surface.

There are several kinds of electrodes used in the repair of wearing surfaces on rail sections. For carbon steel frogs and carbon steel rails a 60 or 70 per cent carbon steel welding rod gives the best results. This welding rod produced a dense, tough metal of excellent wearing quality. On manganese steel inserts, frogs or cross-overs a 12 to 14 per cent manganese rod should be used.

The general tendency up to the present time has been to use welding rods too large in diameter for the work. High carbon and manganese steel rods often present some difficulty to the operators in order to get a perfect fusion, and the general tendency is to get a sufficient



Supporting Flange Welded to Gear Case, Using Electric Arc Welding



Broken Parts of Truck Frames Repaired by Arc Welding

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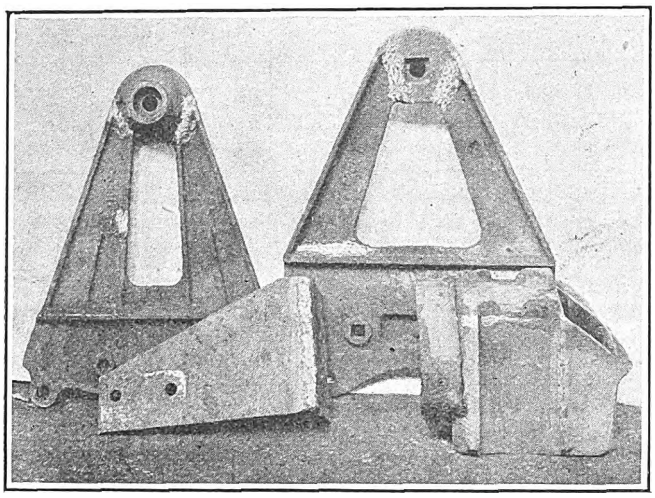
amount of heat by using large rods. These cause damaging thermal disturbances of the metal in the rail head section. Rods of $\frac{5}{32}$-in. or $\frac{3}{16}$-in. diameter are recommended for the work. The welding rod may be used bare with entirely satisfactory results. There is, however, some preference among operators for welding rods which have a sodium silicate and lime covering. The tendency of the covering is to quiet the molten metal and to make it easier for the operator to get a perfect fusion.

Welding Economical for Car Repairs

The sudden starting and stopping with the consequent reversal of strains in all members of cars results in excessive wear at all points where car framing is



Truck Side Frame Repaired by Electric Arc Welding. Breaks in the Frame or Worn Bolt Holes Can Be Repaired in This Way. The Holes Are Filled in with New Material, then Redrilled

fastened together with rivets or bolts. Also, as there are many moving parts, the rubbing of one over another causes rapid wear. Worn car parts must either be repaired by adding new metal through welding, or the part must be scrapped and a new one installed. It is obvious that the repair of such parts by adding new metal results in a large saving. Also, there are many cases where repairs can be made without dismantling equipment and in such cases the use of welding results in additional saving.

Some figures showing the relative cost of welding by either the oxyacetylene or by the arc process may be interesting. The cost of operating an oxyacetylene torch for repair work of this nature varies from 60 cents to $1.50 per hour, with an average in the neighborhood of $1. This takes into consideration the preheating on steel work which is necessary. The following table gives some costs on typical miscellaneous jobs encountered in an electric railway repair shop:

COMPARISON OF REPLACEMENT COSTS WITH COST OF REPAIRS BY WELDING

Description of Job	Cost of Replacement	Cost Using Oxyacetylene Torch	Cost Electric Arc Welding
Bearing housing made of cast steel—repair job	$8.60	$2.60	$0.75
Axle cap—renewing dowel pin-holes	11.15	.70	.25
Repairing armature shaft, pinion seats and keyway	54.00	7.20	1.75
Journal boxes repaired by use of chafing plate	6.90	.80	.20
Truck frame	60.00	3.00	1.10
Resistance grids—typical repair job	3.00	.65	.20
Reducing bore of gear. This job impractical with oxy-acetylene. Reduction too small for use of bushing	30.00	....	4.10

The metals encountered in the repair of cars include cast steel, cast iron, wrought iron, mild steel and bronze. All of these can be successfully handled in the railway repair shop. A large percentage of the work can be "bench work," and preheating furnaces and torches can be used to good advantage.

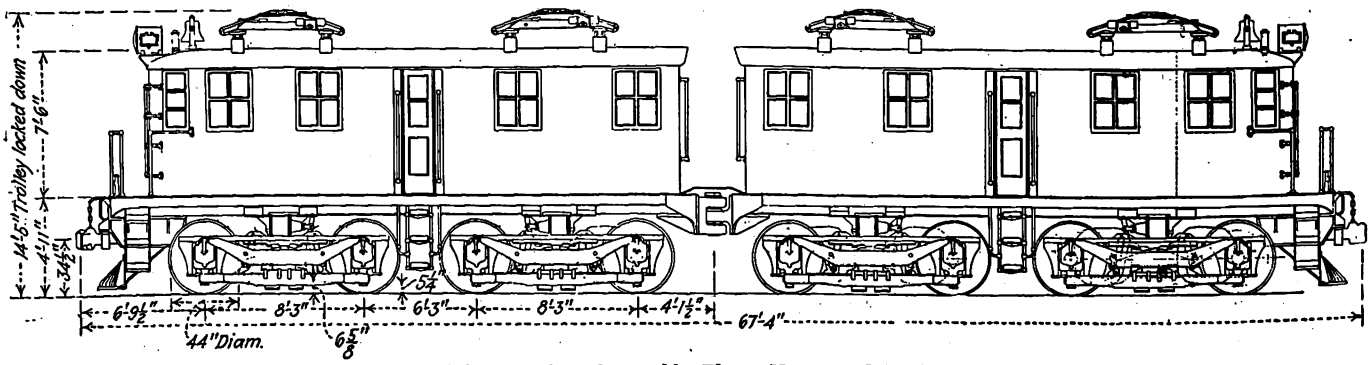
In repairing cars there are many jobs of exactly the same nature since the car equipment is standardized to a large extent. This justifies the spending of a considerable amount of time to solve a particular problem, since similar jobs will recur from day to day.

The capacity of the equipment required is 200 to 300 amp. This permits the use of the machine for either carbon or metal electrode work, on any kind of a job that will arise. There are few cases where it would be necessary to couple two of the units together to get a higher capacity.

Experimental Locomotives for New York Central

Seven Switching and Two Road Freight Locomotives to Be Built Jointly by General Electric and American Locomotive Companies Will Be Equipped for Both Overhead and Third Rail Current Collection

IN ANTICIPATION of the future electrification of the West Side freight tracks running from Spuyten Duyvil to Canal Street in New York City, the New York Central Railroad has placed orders for seven 100-ton electric switching locomotives and two 170-ton road freight locomotives. These will be put in service on the electrified division operating out of New York City. They are to be built jointly by the General Electric Company and the American Locomotive Company. Provision has been made for either third rail or overhead current collection. Specifications for the switching locomotives provide for handling a 1,500-ton trailing train consisting of 75 per cent empties and the balance loaded cars at a speed of not less than 25



The Road Freight Locomotives Resemble Those Now Used in Passenger Service

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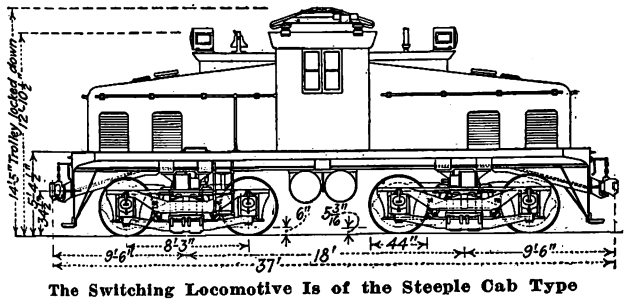
m.p.h. The road locomotives will handle a 3,000-ton train of the same general make-up at speeds of not less than 32 m.p.h.

The switching locomotive is of the steeple cab type carrying two equalized swiveling trucks equipped with four GE-286, 600-volt motors. The outline of the locomotive and the general arrangement of the apparatus in the cab are shown in accompanying illustrations. The nominal continuous rating of this locomotive is 1,240 hp., or approximately 310 hp. per motor. A 72:17 gear ratio is used with the cushion gear, of the type in service on the Paulista locomotives, described in ELECTRIC RAILWAY JOURNAL for June 11, 1921, and is being used also on the Mexican Railway locomotives, described in this paper Dec. 8, 1923.

To insure ample strength for this character of service the cab platform consists of an integral steel casting. A master controller is provided at the engineer's position on each side of the cab and the control and auxiliary apparatus is installed under the hoods of the sloping end cabs.

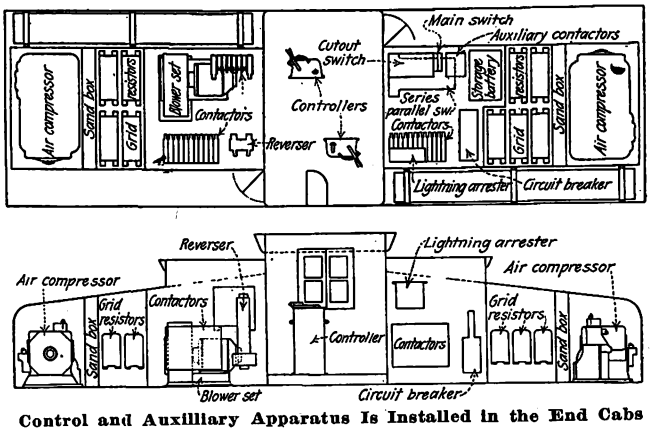
Control is type PCL, with air-operated switches energized from a 32-volt storage battery. In addition to



The Switching Locomotive Is of the Steeple Cab Type

operating all control circuits the 32-volt supply is also used for cab lighting and for headlights. Remote control is used for all accessories, including blower motor circuits, compressors and reversers. A high-speed overload circuit breaker is connected in the high side of the main supply. Additional protection against injury to the individual motors is provided by overload relays in each motor circuit, so arranged that a short circuit on an individual motor will trip out the high speed breaker. The battery is charged by being connected in series with the blower motor. To protect against overcharging, a bypass resistance is used in parallel with the battery, thus reducing the charging current. The use of this resistance is controlled by an ampere-hour meter.

The master controller is of the standard design. It has a main operating handle, a reverse handle and a



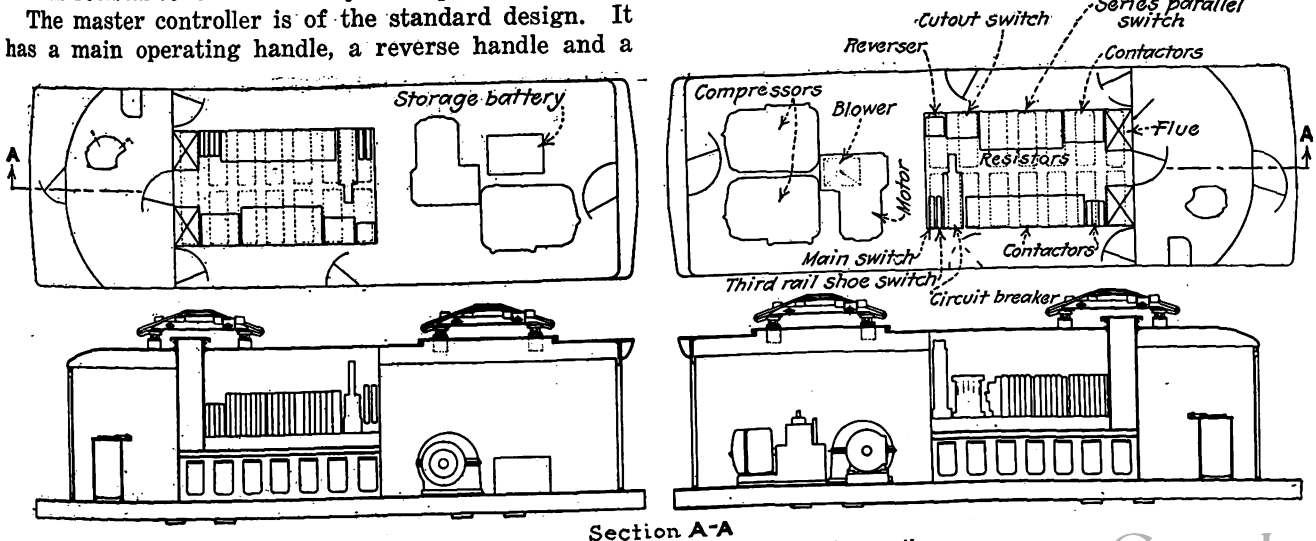
Control and Auxilliary Apparatus Is Installed in the End Cabs

reduced field handle. Three full running speeds are provided with the motors in series, series-parallel and parallel. In addition, two reduced field steps may be used with each motor arrangement, giving a total of nine free running speeds. Air brakes are of Westinghouse type 14 EL, combined straight and automatic. Two CP-26 compressors provide a total of 200 cu.ft. displacement at 130 lb. pressure. Other accessories include a motor-driven blower located in the end cab for ventilating the traction motors, a bell and a whistle mounted on the roof and suitable equipment of air-operated sanders.

ROAD FREIGHT LOCOMOTIVES

Running gear for the road freight locomotives, like that of the two switching locomotives, is coupled by an articulated joint. Motor and control equipment duplicates that used on the switchers. The design of this locomotive is shown on accompanying drawings. A gear ratio of 69:20 permits a maximum speed of 60 m.p.h. Two compressors giving a total displacement of 300 cu.ft. of free air at 130 lb. pressure will be installed.

Two box type cabs are provided, carried on cast platforms similar to those used in the switchers. These will be somewhat similar in appearance to the present passenger locomotives, having rounded ends. There will be a high-speed circuit breaker installed in each cab protecting each half unit independently of the other. Pantographs are of the hornless design operating through a range of 25 in. Two are mounted on each cab. In order to operate over the present electric division and such portion of the West Side tracks as



Arrangement of Equipment on Road Freight Locomotive

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may be equipped with third rail, contact shoes are provided on both sides of each truck.

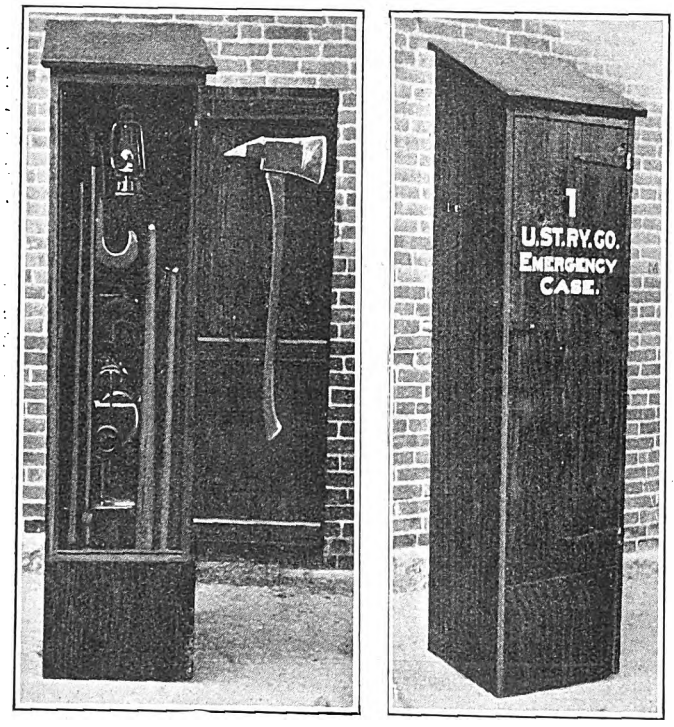
One of the novel details is the provision of forced grease lubrication for the pins in the spring rigging. All locomotives will be equipped with solid rolled steel wheels in accordance with the railroad's specifications. The principal dimensions are given in the accompanying table. A delivery of approximately 12 months is promised for this order.

PRINCIPAL DIMENSIONS OF LATEST NEW YORK CENTRAL ELECTRIC LOCOMOTIVES

	Road	Switcher
Length	67 ft. 4 in.	37 ft. 0 in.
Height (over trolley locked down)	14 ft. 5 in.	14 ft. 5 in.
Wheel base	53 ft. 9 in.	26 ft. 3 in.
Rigid wheel base	8 ft. 3 in.	8 ft. 3 in.
Maximum safe speed m.p.h.	60	40
Gage	4 ft. 8½ in.	4 ft. 8½ in.

Emergency Tool Boxes at Strategic Points to Relieve Blockades

THE Union Street Railway, New Bedford, Mass., has placed 12 emergency tool boxes at strategic points along its lines. Each case contains one large and one small Barrett jack, two jack handles, two sets of jumping irons, four blocks of wood, two crowbars, two kerosene lanterns, one fireman's axe, and 8 ft. of ¾-in. chain, with a large iron hook at the end. Each of these articles is numbered to correspond with the number on the emergency box.



Emergency Case Contains Tools Useful in Case of Accident or Blockade

Motormen and conductors are not allowed to use these tools except when human life is in danger. In such cases entrance to the box may be had by breaking the glass in the door and lifting the latch. All officials of the railway and inspectors, however, carry keys to these tool boxes, and are permitted to use the tools to replace derailed cars or relieve blockades. Every railway car carries a jack and in case of emergency there are therefore a considerable number of jacks available at the scene of trouble. Many blockades, particularly during snow storms, have been relieved before the arrival of the wrecking car.

The Readers' Forum

Comment on Foreign Report

MANCHESTER CORPORATION TRAMWAYS
MANCHESTER, ENGLAND, Jan. 2, 1925.

I think the first of my New Year resolutions shall be to reply to your letter of Nov. 11 last, in which matter I have been most neglectful. Perhaps my reason was mainly that you gave me so much excellent matter to peruse but left me so little to criticise.

I need hardly say I have read your report* with the utmost interest, as, naturally, the views of another expert, and particularly one with such a wide experience as yourself and your party, very much interests us, though I think, perhaps, you have been unnecessarily kind in your observations. Let me, however, sincerely congratulate you on your receptivity of the atmosphere of traffic matters in this country and your grasp of the British point of view and interests.

The first paragraph of your introductory remarks, where you instance how little in general principles either country can show the other, is a true commentary on the situation that the necessities of each are vitally different, nevertheless we can each learn from the other innumerable items of detail and operation which cannot be other than beneficial.

Perhaps the outstanding difference in the general operation of our respective services is that which you indicate as to the standard of maintenance prevailing in this country as compared with your own. This aspect struck me when visiting the States and appears to be somewhat the outcome of our respective mentalities. The Britisher likes a solid, substantial, permanent job and devotes unstinted efforts to maintain that which he has in a state of efficiency probably long past its economic utility. On the other hand, it seems to be the temperament in the United States to use a thing to the utmost and then discard it outright, substituting probably a newer and more effective instrument. Our system perhaps gives a better sense of comfort and well-being all along the line; yours, a more alert and up-to-date result for the newer parts of your concerns and perhaps shows up the older by comparison to a greater extent.

You invite critical comment of your report, but as I have previously stated, you are too meticulously accurate to afford this opportunity and your report is most valuable as being an outsider's survey without bias or predilection on the operations of our various passenger transport activities.

My chairman (Alderman James Bowes) desires to associate with me in kindest regards and the best of good wishes for the New Year.

HENRY MATTINSON,
General Manager and Chief Engineer.

*Report of Committee on Foreign Operations of the American Electric Railway Association, published in ELECTRIC RAILWAY JOURNAL, Sept. 20, 1924.

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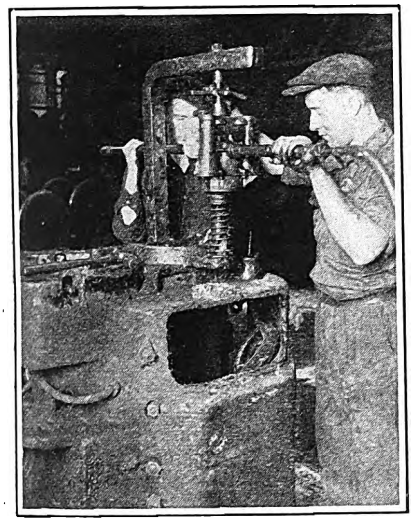
Equipment Maintenance Notes

Spring Support for Portable Drill

THE accompanying illustration shows an "old man" with spring support for a Chicago Pneumatic drill as used in the 39th Street shop of the New York Rapid Transit Corporation, Brooklyn, N. Y. The bracket is clamped to the work in the usual manner. The illustration shows the equipment set up and drilling a hole for a motor suspension. A spring which surrounds the drill and rests on the top of the motor frame holds the portable drill firmly against the top support so that it can be fed down by turning the hand feed in the usual manner. This method of supporting the drill allows the motor to be set up and centered accurately. It removes strain from the workmen and provides an efficient support for heavy drilling operations.

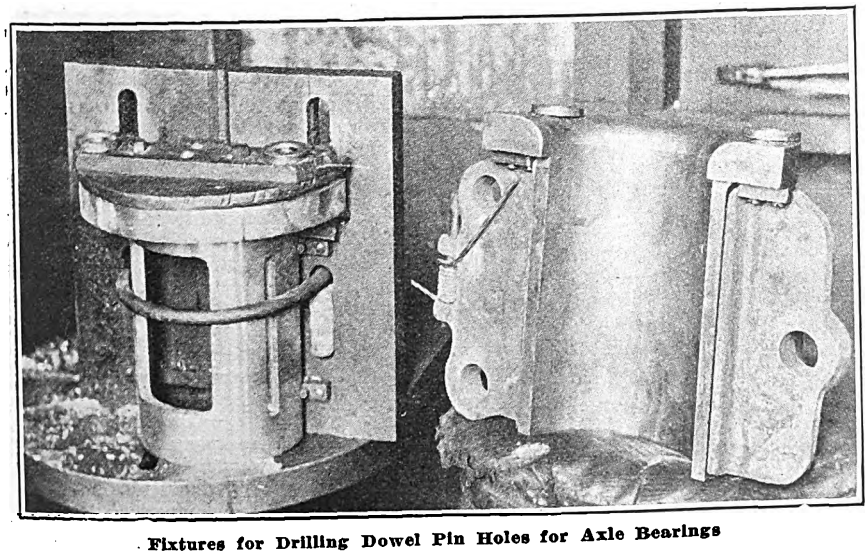


Pneumatic Drill with Spring Support Drilling Hole for Motor Suspension

Axle Bearings Held by Dowels

AXLE bearings are held to the axle-bearing caps by two dowel pins placed in the ends of the caps on the cars of the Gary Street Railway, Gary, Ind. These pins fit tightly into holes drilled in the thrust flange of the bearing. The dowels, which have a diameter of $\frac{3}{4}$ in., project $\frac{3}{8}$ in. into the flange. They are of sufficient size to make a drive fit in the cap.

Two jigs are used to facilitate the work of spotting and drilling both the cap and bearing. The one for drilling the holes in the bearing consists of a plate with guide lugs and a stirrup for holding the lining in position. A movable plate containing the two bushed holes for guiding the drill is lowered onto the flange of the lining. For drilling the bearing cap, a jig made from an axle lining is used. The flange of this lining contains two bushed holes for guiding the drill. Small lugs placed on the underside of the lining flange keep it in position during the drilling process. The locations of the dowels in the end of the bearing cap are such that they do not enter the oil chamber of the cap.



Fixtures for Drilling Dowel Pin Holes for Axle Bearings

Cars Numbered Only on Windows

AS THE result of a discussion some time ago among officials of various departments of the Boston Elevated Railway, it was decided to alter the method of displaying the car numbers on the exterior of surface cars. For the purposes of the transportation department it was desired that transparent figures be painted on the car windows to enable inspectors easily to determine the car number after dark. For the purposes of the rolling stock department it was desired to have as few numbers as possible because these always have to be hand painted and the process is expensive. As a solution of the difficulty it was decided to place the car numbers in the upper part of each of the four corner windows.

A Transparent Number Is Displayed in Each of the Four Corner Windows of the Surface Cars of the Boston Elevated Railway

Black paint, mixed with a small amount of varnish, is applied directly to the inside surface of the window glass. Afterward a coat of white is applied to the entire surface. This produces a transparent white number on a black background. Smaller numbers about 6 in. high are painted on the dashers, but the window numbers are the only ones on the sides of the cars.

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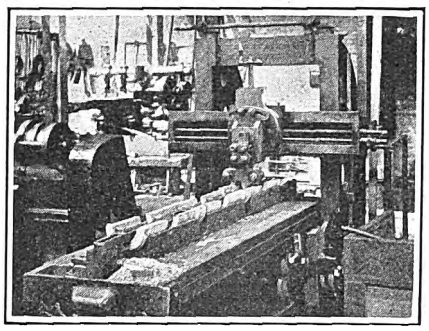
Finishing Bearing Faces in Small Planer

By J. L. Reiff
Machine Shop Foreman Kansas City Railways

When special equipment for the purpose is not available, the joining faces on axle bearing shells may be finished accurately and speedily by using the proper set-up on a small planer. The accompanying illustration shows the method used in the shops of the Kansas City Railways. It will be seen that six half shells are finished at one time.

Curved base blocks are bolted to the bed of the planer. Each block is long enough to take two bearing halves, which are mounted so that the flanges project beyond the ends.



With This Set-up in the Kansas City Shop a Small Planer Is Efficient for Finishing Joining Faces of Axle Bearings

Clamping bolts and bars hold the bearings securely in place. With the arrangement the finished bearings can be removed quickly and a new set applied.

By mounting two tools in the cutting head, the two joining faces are finished simultaneously, reducing the time for doing the work to half.

Hints on Coil Storage

By A. S. Warner
Renewal Parts Engineering, Westinghouse Electric & Manufacturing Company

The storage of armature and field coils should receive more attention than the storage of housings, bearings, etc., because coils are more easily affected by improper handling and atmospheric conditions than any other part of a motor.

Armature and field coils are securely wrapped in protecting paper and are shipped in wooden boxes or paper cartons. All coils except the largest sizes of field coils are packed one set in a box.

Some don'ts which should be considered when storing coils follow:

Don't remove the coils from containers in which they are shipped

Dick Prescott Reaches Centerville

And Tries to Ride a Street Car

Dick Prescott and Steve White arrived in Centerville bright and early in the morning. This was the first stop on their trip of inspection, and they looked forward with keen anticipation to their visit to the Centerville Railway shop, where they hoped to get suggestions regarding the organization and duties of a shop engineering department.

Planning to spend two days here, they had made reservations at one of the principal hotels, and intended to take their bags over and have breakfast before starting out to the shop. Being anxious to get a first-hand impression of the service in each city they visited, they decided to take a street car to the hotel.

Not being burdened with much luggage, they did not bother to call a red cap, but packed up their bags and started out from the train platform, looking about to get their bearings among the unfamiliar sights in the lobby.

There was no local railway employee in evidence at the station, and although several car lines passed the front of the building, they were at a loss to know which car to take. Dick ventured to ask a uniformed taxicab starter, who reached for their bags, how to reach the Grand Hotel by street car.

"None of these cars go near the hotel," was the reply. "Taxi here'll take you right over. No charge for extra passengers."

"No, thanks," said Dick, and the starter disdainfully let go of his bag. As he and Steve walked out to the corner they were besieged by a string of rival taxi drivers.

"Taxi?"

"Taxi, sir?"

"Right up to the hotels! Taxicab."

"No charge for extras! Taxi right here, sir!"

They kept resolutely ahead until they reached the corner. Steve remained to guard the bags while Dick dodged through a stream of automobiles to ask the conductor on a car which had stopped at the corner how they might reach the Grand Hotel.

"Does your car go past the Grand Hotel?" asked Dick. "Naw, we don't go that way, that's up town," was the reply he received as the conductor signaled two bells. No wiser than before, Dick motioned Steve to stay with the bags, while he approached the traffic officer in the intersection, working his way through a line of taxicabs and still more automobiles that shot past him, and being sworn at by one of the drivers.

"Grand Hotel?" repeated that busy individual, as he changed the traffic signal, and then glanced at Dick. "Why, that's right up town; one o' them cabs'll take you up there for 50 cents."

"Yes, I know that; thanks," said Dick a little impatiently," but we'd like to ride over by street car."

The officer again changed the signal for traffic, looked at Dick for a moment and then replied:

"Well, if you want to take a car that goes by the hotel, you'll have to walk up 3 blocks and over one and then wait for a No. 4 car going up the hill. The No. 6 car on this street here goes within 2 blocks of the hotel, but you'll have to get on here and ride around the loop down at the square."

"Thanks very much," said Dick as he turned to rejoin Steve at the corner.

"What luck?" inquired the latter, as Dick again successfully dodged his way through the stream of vehicles.

"Well, if the street car ride to the hotel is worth the trouble of finding the car, it ought to be some ride! Come on, let's try it. We've got plenty of time, anyway, and I want to get all the ideas I can while we're here."

"Thank goodness these bags are light," said Steve, as they stood waiting for the traffic to change in the proper direction. "I wonder if the manager of this property ever tried to ride from the depot to the Grand Hotel on a street car."

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until ready to use them. The coils may be identified by the information on the container.

Don't hang coils on pegs or place them loose in bins where they will soon collect dust, dry out and swell. Coils exposed to circulating air will deteriorate more quickly than coils kept in containers.

Don't store coils in a room which is too dry and hot.

Don't store coils in a cellar or other damp place.

Conditions are much less favorable for a long life of winding if dried-out coils are used for rewinding than if the coils become hard and brittle due to overheating from overloads after they are wound in the core.

A dried-out coil is hard to wind, it does not shape up easily, and the insulation will crack under the blows of the mallet. To make such coils more easily wound, they should be heated first in an oven. This softens the black plastic varnish and the shaping can be done more easily with less insulation breaks.

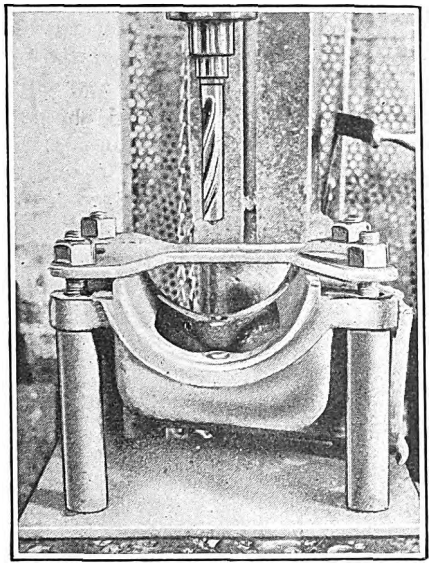
After the coils have been wound without injury and the armature dipped, baked and banded, a coil dried out in service may have a long operating life, provided there is no movement of the coil in the slot.

All armature and field coils are insulated with materials which deteriorate rapidly under certain unfavorable conditions of heat and humidity. Even under the most favorable conditions some of the treated materials deteriorate with age. Aside from the deterioration of the material, the coils may be damaged and rendered unfit for use by careless storage and improper handling. The leads of coils that are stored in the original container will be in a better condition for winding and less liable to suffer from dirt and corrosion than those exposed to deteriorating influences.

If proper attention is given to the storage of coils the insulation will be kept in a fresh and pliable condition. This will reduce maintenance costs by permitting maximum life to be obtained from the windings.

Fixture Holds Bearing Cap for Drilling

A FIXTURE for holding an axle bearing cap while the bearing retaining pins are drilled out has been developed in the Wheaton, Ill., shops of the Chicago, Aurora & Elgin Railroad. The fixture consists of a base of ½-in. steel, approximately 18 in. long by 12 in. wide, at the four corners of which are 2-in. diameter posts, threaded at their upper ends to receive 1-in. nuts. The bearing cap is placed over the four posts as shown in the illustration, being held



The Axle Bearing Cap Is Held in a Fixture While Bearing Retaining Pins Are Drilled Out

in the horizontal position by the shoulders on the posts. It is clamped to the fixture by a top plate and four nuts. The top plate is cut away on the sides to provide clearance for the drill and spindle.

This fixture, which was made in the shops, has facilitated this drilling operation considerably. It requires only a minute or two to set up and the holes are drilled accurately.

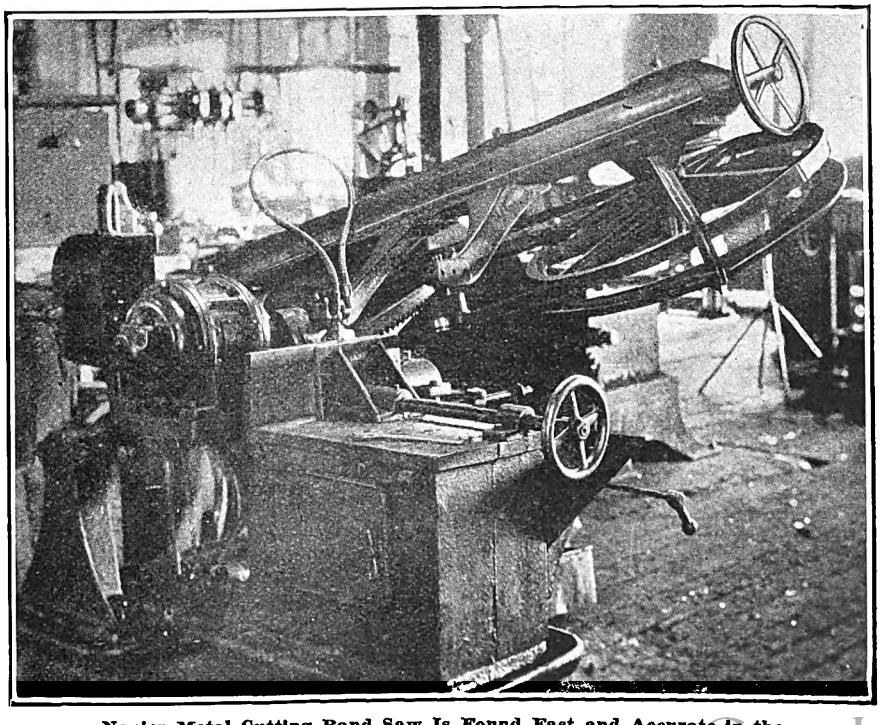
Band Saw Expedites Metal Cutting

BY O. R. HOTT
Columbus Railway, Power & Light Company, Columbus, Ohio

A NAPIER metal-cutting band saw is used in the car repair shops of the Columbus Railway, Power & Light Company, Columbus, Ohio, for the usual cut-off operations ordinarily performed by a reciprocating hack saw. The accuracy and speed of this band saw make it superior to the other type. It is possible to work within 0.005 in. of a perfect cut through a block of metal 10 in. x 10 in. As the blade travels in the cutting direction only, the saw is considerably faster than the reciprocating type.

The band-saw blade is carried in a movable frame on two 2-ft. diameter pulleys mounted on 3-ft. centers. This frame is hinged so that it may be tilted up to receive the piece of work. The frame is counterbalanced so that the blade may be fed by gravity. In its normal position the frame and saw blade are horizontal. The two pulleys are inclined a few degrees from horizontal so as to provide clearance for the work on the return side of the blade.

The saw teeth, on the lower edge of the blade, engage the work midway between the two pulleys. Two sets of small guiding pulleys twist the cutting portion of the blade so that it will be perpendicular to the work. A stream of cutting oil which impinges upon the blade as it



Napier Metal-Cutting Band Saw Is Found Fast and Accurate in the Columbus, Ohio, Railway Shops

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leaves the work washes off the metal particles.

For cutting various materials, several sizes and types of blades are used. Three different tempers are used, and the number of teeth vary from 10 to 24 per in. The pulleys accommodate a 1-in. saw having a thickness of 0.035 inch. These latter dimensions are uniform for all saws. The saw is driven by a 1-hp. motor through spur gears and a bevel gear mounted on the driving pulley.

After the machine has been started it is unnecessary to give it further attention until the cut is finished. Simplicity and speed are features of the saw which have made it valuable in the Columbus shops.

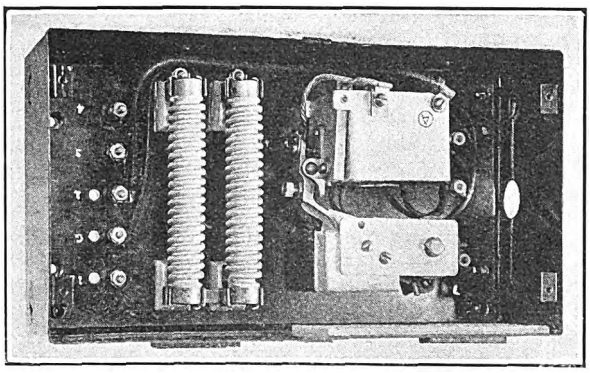
Worn Wheel Flanges Built Up in Detroit

ELECTRIC welding is being used to build up worn flanges of car wheels in the repair shops of the Department of Street Railways, City of Detroit. This procedure is expected to bring about an increase of 20 per cent in the life of the wheels. When flanges are worn to $\frac{5}{8}$ in. thickness or less, the wheels are removed and sent to the repair shop. Here a General Electric continuous-current automatic electric welding machine replaces the worn-out flange metal. A separate driving motor rotates the wheel assembly and the welding operation is continuous and automatic. Two pieces of welding electrode of approximately $\frac{1}{8}$ in. diameter are kept in constant contact with the wheel at different points where the flange needs building up. The wire is supplied automatically from overhead coils, the contact and feed being continuous. The actual welding operation for one wheel is completed in an average time of 1 hour. The rough surface is then refinished on a Norton car wheel grinding machine.

New Equipment Available

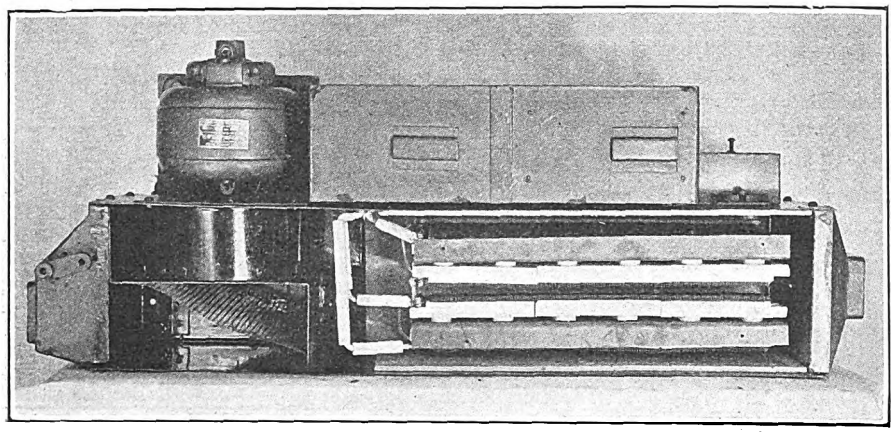
Electric Blast Heater

TO REPLACE hot air stoves and to provide for installations where a combined heating and ventilating equipment is desired, the Consolidated Car Heating Company, Albany, N. Y., has brought out an electric hot air heater. A Sirocco fan, motor driven, draws air in at one end of the heater and discharges it over the heating elements, where it passes out at the opposite end. The air inlet has a brass screen, so that foreign material cannot be drawn into the inside of the heater, and a damper is provided so that the air can be taken either from outside the car or inside, or from both if desired. This arrangement permits of a minimum amount of outside air being used in the most severe winter weather and for a maximum at all other times. The unit can be used solely as a ventilating system during weather when no heat is required. An extension handle can be run from the damper handle out toward the front, or up to any convenient location.



Blast Heater With Electric Heating Coils

The electric heater has four elements mounted on porcelain blocks side by side. These in turn are supported on sheet iron plates. The blast heater is not only used in passenger cars, but it has proved particularly effective in cars used to transport fruit and other perishable goods in interurban service. With the usual type of electric heaters mounted around the sides of the car there is danger of their being damaged. If crates or boxes are placed close to such heaters circulation is prevented and uniform heating does not result. With the blast type of heater installed overhead, a uniform distribution of heat results.



Control Switch and Resistance Mounted as an Integral Part of the Blast Heater

Electric Tapper

A PORTABLE electric tapper has been added to the line of electric tools manufactured by the Black & Decker Manufacturing Company, Towson, Md. The mechanism in the gearing case is so designed that the tap is driven in at a speed of 350 r.p.m. By a slight backward pull on the machine the tap is automatically reversed and is backed out of the plugged hole at double the speed at which it is driven in. No reversing switch is needed. The machine will tap holes in steel up to $\frac{1}{4}$ in., in cast iron up to $\frac{3}{8}$ in. and in brass or aluminum up to $\frac{5}{8}$ in. The machine weighs $8\frac{3}{4}$ lb. and is equipped with a universal motor so that it may be operated on either direct or alternating-current circuits.

Quick Change Electrode Holder

A NEW type of welding electrode holder marketed by the General Electric Company allows the welding operator to make a quick change from the burnt stub to a new electrode. Merely striking the stub end of the old electrode causes it to drop out so that the new wire can be inserted.

The new holder consists of a punched fiber tube with a tinned brass plug inserted in the end. A steel spring rod holds the electrode in place against one of several different sized notches provided for the purpose. The welding cable running to the source of power is soldered to the other end of the holder.

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Association News & Discussions

Grade Crossing Hazard Discussed by C.E.R.A.

Prevention of Highway Accidents a Main Topic at Dayton Convention—Pick-Up and Delivery Freight Service and Superpower Developments Complete Two-Day Program

HIGHWAY safety and prevention of grade crossing accidents, advantages and limitations of pick-up and delivery freight service by electric railways and some of the outstanding factors in superpower development that are of interest to electric railways formed the principal subjects discussed at the annual meeting of the Central Electric Railway Association, held at Dayton, Ohio, on Jan. 8 and 9. Approximately 300 railway and supply members and guests attended the meetings and took part in the well-filled business and social program.

In his annual address, which is printed elsewhere in this issue, President Harry Reid outlined some of the principal developments during the past year and expressed a spirit of optimism and of ever-increasing confidence in the future of electric railways.

Along with these cheerful words, however, came the announcement of the death of S. D. Hutchins of the Westinghouse Traction Brake Company and of James A. Bredt, Cincinnati manager of the Westinghouse Electric & Manufacturing Company, two valued members of the association. Out of respect for their memory those in attendance bowed their heads until the sound of the president's gavel. A memorial to the service and life of each was read by James A. McGowan, chairman of a special committee appointed for the purpose.

Co-operation Urged to Stop Grade Crossing Accidents

In an address on the prevention of grade crossing and highway accidents by A. E. Makee, president the Ohio Association for Prevention of Grade Crossing and Highway Accidents, a plea was made for co-operation by all of the agencies interested in the conservation of human life and limb and for the use of deliberate and sound judgment in drafting legislation for the relief of present appalling conditions. He cautioned against the adoption of hasty and ill-considered legislation, which would set up arbitrary and ridiculous restrictions and rules that would only result in further disregard for law. Only by that co-operation which is born of a mutual desire to stop the present destruction of life and property, he explained, can an effective step be taken toward the reduction of crossing and highway accidents. In the last analysis these are due to disregard by a very small portion of the motor vehicle drivers for the personal safety and rights of others.

Copies of the proceedings of the conference on grade crossing and highway accidents called by the Governor of Ohio last summer were distributed by Mr. Makee. He said further that the necessity for traffic legislation came from increasing congestion, and that experience and precedent were lacking. He also pointed out that the conditions of future traffic are unknown, and that legislation must therefore be started with sanity and common sense.

Above all other factors, he contended that the most dangerous element in the traffic situation, and the one demanding immediate and decisive action, is that presented by the drunken automobile driver. This hazard to the safety of pedestrians and other users of the highways must be effectively removed, he insisted. Education of drivers was held to be still another important method of reducing accidents. Not much hope was held out for effective results among adults, but the opportunity for work in the schools was considered to constitute a big hope for the future.

Carelessness the Main Cause

Practically all grade crossing accidents are the result of carelessness, he said. During the period when steam and electric railroads were originally projected and built the laws were made so as to put the responsibility for accidents on the railroads. With the advent of the automobile, the laws governing its use were made by the automobile men. Consequently, at the present time the pedestrian must look out for himself and must keep out of the way. Common sense and co-operation must accompany the offer to relieve this condition if permanent improvement in conditions is to be made.

According to Mr. Makee, there will always be grade crossings of steam and electric railroads. They can't be eliminated, he said, because new crossings are being put through faster than existing crossings are being removed. He advocated clearing away obstructions so as to give unobstructed view on both the rail line and the highway. This is one step contemplated in the Ohio program. Compulsory insurance as a requisite to the issue of a license is also contemplated, although he admitted that there is a danger from this step, in making the drivers of automobiles feel less personal responsibility. Physical and mental examination for a license to drive on the highways was also advocated. It was felt that such examinations should be comparatively easy, but that the license also should be easily revocable and hard to reinstate.

A further discussion of the subject of safety regulations at railway grade crossings by Wallace Muir, general attorney Kentucky Traction & Terminal Company, was read by his assistant, Mr. Becker. An abstract appears elsewhere in this issue. George M. O'Connor, claim attorney Detroit United Lines, also read a discussion of the same subject, which is abstracted elsewhere. In introducing his remarks, he said that one of the important elements in the improvement of conditions at railroad-highway crossings was uniformity in the regulations to be adopted by various states. Wide variations in such regulations would lead to confusion and hardship and would make it difficult for tourists visiting several states to avoid violating some of these various laws.

"Full Stop" Legislation Urged

Charles L. Henry, president Indianapolis & Cincinnati Traction Company, called attention to the recommendation of the recent national conference on grade crossing and highway accident prevention that state legislatures authorize their public utilities commissions to specify those crossings that are considered hazardous and at which all vehicles will be required to make a full stop. He also called attention to the recommendation of the same conference which would require automobiles to slow down to 15 m.p.h. when crossing railroads. This requirement, he said, would at least force the driver to think of what he is doing and would avoid many accidents that are caused by failure on the part of the driver to remember that he is crossing a railroad. Although the first step is to get common sense laws on the statute books, he emphatically pointed out that the next and bigger job is to get behind these laws to see that they are enforced. For this reason he advocated a state constabulary to enforce the highway laws.

Further discussing the subject, J. B. Dugan, secretary Ohio Association for Prevention of Grade Crossing and Highway Accidents, said that it was desired to prepare laws in Ohio which would be in conformity with those adopted in other states. From the proceedings of the Ohio Safety First Conference, he read the proposed measures for reducing grade crossing and highway accidents that were adopted at that meeting.

An important business group which should be interested and made a part of any organization for the reduction of crossing accidents, according to Mr.

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Dugan, includes the real estate development companies. They must be interested in this work, he said, in order that they will co-operate to the end of holding down the number of new rail crossings that are put in when new sub-divisions are developed.

J. P. Barnes, president Louisville Railway, outlined briefly the history of the recent Hoover national conference* to reduce traffic accidents. He pointed out how the recommendation for placing the designation of railroad crossings at which vehicles must stop in the hands of the various state public utility commissions had been the means of getting accord between representatives of railroad and automobile interests. He drew a lesson from this incident of the value of frank discussion and honest co-operation, in improving the present appalling conditions. He urged that electric railway men assume personally the responsibility for talking at every opportunity in favor of enforcement of the recommendations of the conference. The question was far above that of a financial problem, he said, and offered an opportunity for an actual service to the American people in improving the present terrible conditions resulting from carelessness and disregard of life.

Resolutions Indorse Work of Hoover Conference

A special committee of the association under the chairmanship of Arthur W. Brady, receiver Union Traction Company of Indiana, had been appointed to review the recommendations of the state committees on prevention of grade crossing and highway accidents. In the absence of Mr. Brady, resolutions indorsing the work of the state conferences and of the national conference held at the call of Mr. Hoover were read by Mr. Barnes.

Whereas at the call of the Governors of Ohio and Indiana, respectively, broadly representative conferences have recently been held in those states for the purpose of ascertaining and recommending practical and effective ways of reducing the awful toll of life, limb and property due to accidents at grade crossings and on the highways, and

Whereas similar conferences of national scope have been held at the call of the National Association of Railway and Utility Commissioners and of the Secretary of Commerce, and

Whereas each of these conferences developed constructive recommendations for the advancement of street and highway safety; now, therefore, be it

Resolved, By the Central Electric Railway Association in annual session convened at Dayton, Ohio, this ninth day of January, 1925, that it heartily commend the National Association of Railway and Utility Commissioners, Governor Donahey of Ohio, Governor Branch of Indiana and Secretary Hoover, for their wisdom, enterprise and keen public spirit as manifested in calling these conferences; and be it further

Resolved, That said association hereby request the electric railway companies, members of the association, to co-operate heartily with all other public and private agencies in carrying out the recommendations of these conferences; and be it further

Resolved, That the said association respectfully and earnestly request the legislatures of the several states within which its member companies operate to give careful consideration to the enactment into law of such of the said recommendations as require legislative action before they may become effective; and be it further

Resolved, That the Central Electric Railway Association hereby pledge its wholehearted support and co-operation to the further development and ultimate adoption of the constructive and humanitarian program so splendidly begun.

*See ELECTRIC RAILWAY JOURNAL, Dec. 20, 1924, page 1042.

Freight Delivery Service

A general discussion of the subject of pick-up and delivery freight service was started by J. P. Longon, auditor Toledo & Indiana Railroad. He said that a pick-up and delivery service which had recently been installed by his company in Toledo was rendered by a large independent transfer company in the city at a charge of 8 cents per 100 lb., with a minimum charge of 25 cents. This charge, however, is effective only in the first zone, which includes an area of approximately 1 mile radius from the center of the business district. Most of the shippers of any importance are located in this area. In a second zone having a radius of 2 miles the rate charged is double that for the first zone, making the cost of pick-up and delivery to the shipper 16 cents per 100 lb., with a minimum charge of 50 cents. A third zone has an approximate radius of 3 miles and the charges are triple those of the first zone. This service in Toledo has just been outlined and the new tariff published. It will be put in as an optional service for shippers in that territory. Previously, free pick-up and delivery had been furnished in some of the smaller communities along the line. The cost of such service, which was absorbed by the railway, varied from 4 to 7 cents per 100 lb. When the free service was put in for these outlying towns the gross revenue from freight increased approximately 18 per cent and two competing truck lines that had been handling most of the l.c.l freight were ready to sell out. The net revenue from this increase in business went up about 8 per cent, showing that the cost of the pick-up and delivery service which was absorbed by the railway was 10 per cent of the increased gross revenue.

In its tariff the railway assumes the liability for damage to shipments while on the trucks of the trucking company, but its contract with the trucker makes the latter responsible to the railway for all damages to shipments while on the trucks.

Experience with pick-up and delivery service on the lines of the Cincinnati & Dayton Traction Company was outlined by C. M. Byrne, traffic manager. In one case, at a small manufacturing town on the line, a freight business of only a few hundred pounds per month was increased to nearly a million pounds per month by the establishment of a free pick-up and delivery service costing about 5 cents per 100 lb. outbound and 4 cents per 100 lb. inbound. This cost is absorbed by the railway and some of its connecting lines that participate in the revenue.

At another manufacturing town on the line a pick-up and delivery service at a charge of 5 cents per 100 lb. with a minimum charge of 25 cents had yielded little increased revenue because the centrally located industries in the community claim they can handle the shipments at less cost with their own trucks. At the principal shipping point and terminal on the line a pick-up and delivery service has been furnished for some time at 10 cents per 100 lb., with a minimum charge per shipment of 25 cents. This charge covers territory in some cases 10 miles from the station. The service has resulted in doubling the revenue from outbound freight and trebling that from inbound freight. In these last two cities the charge is added to the freight and paid by the shipper on prepaid shipments or by the consignee on collect shipments. This charge is covered by tariffs and is shown on waybills as advances for drayage. The service assures prompt handling of all shipments and relieves the stations of congestion due to failure of the consignees to take up shipments promptly. Trucks are on hand when the cars are opened and all delivery freight is handled direct from car to truck.

T. H. Stoffel, Westinghouse Electric & Manufacturing Company, described the experiment being conducted in Baltimore after extended investigation by the Interstate Commerce Commission. A charge of 15 cents per 100 lb. is made for the pick-up and delivery service, but after a year of the experiment it has not proved to be particularly successful. An optional pick-up and delivery service that is furnished by the Connecticut Company was also described by the speaker. In this case only about 15 per cent of the shippers use the service, and these are limited to the occasional shippers, the regular and large shippers preferring to use their own truck equipment.

Mr. Stoffel warned against the possibility of discrimination unless the service at all towns on a line is put on the same basis. He said that pick-up and delivery service in a large city is not attractive to the shipper unless all the transportation agencies in the community put in the same service, as otherwise the shipper is required to maintain truck equipment for handling freight over such lines as do not have the pick-up and delivery. Another factor of cost in connection with such service that must be taken into consideration is the clerical work entailed, and Mr. Stoffel maintained that a charge of 8 to 10 cents is not sufficient to cover all of the costs of such service. He expressed the belief that pick-up and delivery would ultimately be made a part of the service of all rail lines, but doubted its advisability until it could be made a universal service.

An outline of the principal phases of superpower development of interest to the railways was given in an address by E. H. Sniffin, manager power department, Westinghouse Electric & Manufacturing Company, and is abstracted elsewhere in this issue.

Officers Elected

The nominating committee, consisting of C. L. Henry, H. A. Nicholl and J. A. McGowan, recommended the following for officers and members of the executive committee for the ensuing year, and on motion from the floor they were unanimously elected:

President, F. R. Coates, president Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.

First vice-president, G. K. Jeffries, Indianapolis, Ind.

Second vice-president, Martin Ackerman, Dayton, Ohio.

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Executive Committee: J. P. Barnes, S. W. Greenland, R. I. Todd, A. C. Blinn, H. A. Nicholl, W. S. Rodger, F. W. Coen, J. F. Collins, Myles B. Lambert, James H. Drew, and L. W. Van Bibber.

A dinner, followed by dancing, and a trip to the McCook government experimental flying field made up the social part of the program. On Friday afternoon the members of the association were entertained at luncheon as the guests of the Ohmer Fare Register Company.

Preventing Grade Crossing and Highway Accidents*

By Wallace Muir
General Attorney Kentucky Traction & Terminal Company

THERE has been an ever increasing loss of life and property resulting from the grade-crossing accident, and unless some action is taken by public officials, by the railways of the country and by the public generally, this tremendous toll will necessarily continue to increase. The desired end cannot be accomplished by the railway companies or by the public generally, acting alone; if anything is to be accomplished it must be the result of a concentrated effort on the part of both the railways and the public. The railways cannot, even were it possible for them to do so, eliminate grade crossings, if the public continues every year to construct nearly twice as many crossings as were eliminated by the railway in the same time.

It seems to me that in order to reduce grade-crossing accidents we must first determine the cause. When we realize that in the United States there are 7,600 people killed and more than 2,000,000 injured every year, as the result of accidents, the situation becomes so appalling as to demand the attention of all the people throughout the length and breadth of this country. As a result of accidents millions of dollars per year are lost in wages and millions of dollars per year are lost in production. It is claimed that of the people killed each year, one-fourth are children under 15 years of age. Such waste of life is an indictment of the citizenship of this country, and particularly of the officials of city, county, state and nation.

Confining ourselves to highway fatalities in the United States, I am informed that in 1923 there were 22,621 persons killed, divided as follows: steam railway crossing accidents, 2,268; street car accidents, 2,006; accidents from other vehicles, 1,559; motorcycle accidents, 336; automobile accidents, 16,452. There were 678,000 injured with an economic loss of $600,000,000. It is estimated that in 1924 there will be an increase in fatalities of 15 per cent, and in 1925, the number will be 55,000 people killed and 1,500,000 injured. The question is, is there not some way in which we can bring to the attention of the American people this astounding condition? A large number of steam railroads throughout the United States and many electric interurban lines are gradually eliminating grade crossings. In 1923 the railroads in the United States eliminated 1,130 crossings at an approximate cost of $70,000,000, but during the same time local authorities established 3,554 new grade crossings. At this rate it will be readily seen that the grade crossing can never be eliminated, if the counties and states continue to exercise their right to build and construct grade crossings instead of prohibiting the construction of such crossings. But I do not believe the elimination of the grade crossing will stop the sacrifice of human lives and loss of property, for we are told that even where the grade crossing has been eliminated by viaduct or underground passages the reckless automobile driver, heedless and blind to danger, a devil of speed and a slave to recklessness, continues to kill and maim by wrecks at such points.

The engineer who pulls a train is a man of mature years, sober and discreet, who has had years of experience and is constantly under the supervision of superior officers, and he knows that one act of forgetfulness will cause him to lose his position. The operator of the interurban electric car is of the same character. He reaches this position by intensive training and careful inspection, and the train, whether steam or electric, is confined to two rails and is bound to stay upon its own side and upon its own right-of-way. It does not dart from side to side and cannot be compared to the high-powered automobile from the standpoint of danger.

Whenever the law of our country is such as to require sufficient training on the part of the automobile driver before he is permitted to drive, and when laws are rigidly enforced as to his conduct in the operation of the automobile, we will then, and not until then, reduce grade-crossing and other highway accidents.

If one who is permitted to drive an automobile under a license knew that he would forfeit this right as a result of misconduct on his part, he would be much more careful in the operation of his automobile. If parents could be held responsible for the use of the family car by the minor, in some way other than in damages, this class of accidents would be greatly reduced if not eliminated.

In conclusion, I give for your consideration in the elimination of the grade-crossing accidents this one thought: Take such steps as are necessary to control the driver and the user of the automobile. If it can be done by legislation, then let's legislate; if it can be done by arousing a public opinion to the proper consideration of the situation, then let's take steps to arouse and incite such a public opinion. If it is necessary to take drastic steps, such as the forfeiture of the right to drive an automobile, forfeiture of the automobile itself, requiring the "stop, look and listen rule," imputing the negligence of the driver to all occupants of the machine, and any other such drastic measure which will be helpful in the saving of human lives, then let's take such steps.

*Abstract of discussion before the Central Electric Railway Association, Dayton, Ohio, Jan. 8-9, 1925.

Increasing Confidence in Electric Railway Future*

By Harry Reid
President Central Electric Railway Association

THE past year has developed an ever-increasing confidence in the future of electric railways, and much of the uncertainty which has existed for several years past is giving way to a feeling of optimism, which is evidenced by improvements which have recently been made or are under way in the various branches of service rendered.

It is realized more fully than ever before that a large part of the local or short-haul travel, which formerly meant so much to operating revenues, has been lost to the motor vehicle, both privately owned and public, and that if passenger income is to be maintained or increased, it must be done through intensive development of the longer haul travel. The public is demanding, and is willing to pay for, faster and more comfortable transportation, and to meet this requirement a number of our lines have found it necessary to revert to the heavier and easier riding type of rolling stock and provide a so-called de luxe service, including parlor, dining and sleeping cars, and I believe results as a rule have been very satisfactory. I understand parlor or chair cars, with an extra charge for the service, are being operated on at least five of our member lines, and that four or five others are preparing to furnish such service. Other improvements resulting in operating economies which are being provided are modern motive power and automatic substations, in both interurban and major city operation.

Material progress is being made in the standardization of freight rolling stock, accounting, operation and methods, through the efforts of the various subsidiary associations. This is particularly true of the Traffic Association, which during the past year has perfected the details and agreements necessary for the publication of a joint through passenger fare basic tariff covering practically the entire territory traversed by Central Electric Railway Association lines. Joint through rates and divisions have been established with both electric and steam

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lines, to and from much additional territory, thereby increasing materially the scope of operations and making available to electric lines a much greater volume of tonnage, and at the same time enlarging the markets of shippers because of the superior service rendered.

Substantial improvements have also been made in freight station and terminal facilities, such for example as the Indianapolis terminal, and I believe others are under way or projected at such important points as Cleveland, Detroit, Fort Wayne, etc., all of which will no doubt result in material increases in volume of tonnage and economies in operation. There has been an appreciable increase in the number of freight cars in service of a more standardized design, making possible a freer interchange of equipment, and thereby expediting the movement of freight and resulting in substantial savings in cost of handling.

A matter of much importance to the industry is the better understanding which the public generally now has of the problems and difficulties of the electric railways, brought about by the educational efforts and the public relations activities of the various properties. It is becoming increasingly evident to the public that the electric railway is the backbone of the prosperity and growth of their communities. As a result, civic authorities and regulatory bodies are co-operating to a greater extent than ever before in the solving of transportation problems.

One of the most serious problems confronting the electric railway industry today is the unfair competition of the motor vehicle, which in many localities is unregulated and operated by irresponsible parties, taking the cream of the traffic in territory which electric railways have built up through many years of effort.

It is generally conceded that the motor bus and truck have an important place in the transportation of the country, in serving communities and districts isolated from rail lines, as feeders to rail lines, and also that they can be made an efficient auxiliary to existing electric railways, when service is properly co-ordinated. But the unregulated motor vehicle is destructive alike to public welfare and the prosperity of electric railways. It is the general opinion, which has been amply demonstrated, that electric railway operators, with their knowledge and experience in the transportation business, are best qualified to meet the transportation requirements of the public, and that bus operation in the territory served by their lines, and where there is need for such service, should be supplied exclusively by them. Realizing that the public can best be served by providing the type of transportation best suited to the demands, and as a means of conserving revenues, many of our member lines have provided auxiliary bus service. However, in order further to protect our interests and investments, and in order that the public may have safe, reliable and satisfactory transportation service, it would seem necessary that electric railways forestall as much as possible the encroachment of independent bus operators in their territories, by themselves providing the service demanded by the public. At the same time such steps as may be necessary should be taken to secure necessary legislation providing for proper bus and truck regulation, under the jurisdiction of the same authorities governing the operation of rail lines, with a provision requiring a certificate of convenience and necessity in each case.

Superpower and the Railways*

By E. H. Sniffin
Manager Power Department, Westinghouse Electric & Manufacturing Company

A DOZEN years ago I advocated that the railways should take their power from the central station. Most of them have by this time adopted that policy, and found the advantage of it. What, then, is the interest of railway men today in this question of power, and more particularly in the superpower phase of the subject? Superpower does not mean local interconnection of existing systems, but the establishing of great power zones, themselves interconnected, using 220,000-volt trunk transmission lines. You are interested, for you are large users of power. The populations of our most congested districts use for their transportation from 30 to 40 per cent of their total energy consumption. Even in the less populous districts the power for traction service averages around 20 per cent. I find, too, that of your total operating costs, power constitutes something like 15 to 17 per cent. So I take it you are interested in any movement that will tend to improve the availability and the cost of this indispensable commodity. Moreover, the importance of this question reaches to every inhabitant of the country.

If you will permit me to exaggerate a little bit—and not so very much either—I venture the assertion that our position today, relative to what we can do, compares, in its state of undevelopment, to the place we occupied in 1885 when direct current was the only system of transmission we knew. Do you realize that electric service today is touching only about 65 per cent of our population; that only about one-third of our homes use it, and that inefficient isolated plants still aggregate as much total power as all the central station plants combined? Power generation as we conduct it today is taking about twice the coal it should. If all this power were developed with the efficiency of our best existing central stations, it would save about 150,000,000 tons of coal per annum and perhaps the labor of half a million people. Is it not impressive to know that more than 80 per cent of the potential water power of the United States still remains undeveloped—more undeveloped water power than all the power we are using today?

Can any one doubt that the steam locomotive must sooner or later go the way of the horse? The railroads use today about as much coal in their locomotives as all the industrial plants of the country combined. Much of this coal can be saved; but more important still, the railroads will have to be electrified to meet the country's growing transportation requirements.

So we can see clearly what lies ahead of us. We have got to utilize every available source of power that we possess, and bring this power to every one everywhere. And that is what we mean by superpower. Many power developments not considered heretofore feasible because of an inadequate market would be entirely practical as part of a comprehensive system. You cannot run trolley cars through some sections of the country, because it wouldn't pay. For the same reason it has not been possible to run transmission lines to many places where they would have been a great blessing, but in my opinion there is enough saving possible in our present methods of operation to enable us to extend the benefits of electric service to the tillers of the soil, and I think the idea will not reach its full fruition until we do.

The public has heard about superpower and is interested. It does challenge the imagination, even of the layman. Articles are written about it and the politicians are listening. A recent candidate for the Presidency stood openly for the government ownership of public utilities. Governor Smith of New York thinks the water powers of that state belong exclusively to its own citizens. Maine has a law prohibiting the export of its hydro-electric power. Governor Hunt of Arizona was recently re-elected on the issue of whether Arizona would join the seven-state agreement concerning the power development of the Colorado River. Six other states had consented, but Hunt opposed it. If a state intends to confine the use of its water power within its own borders it might just as well cut off its railroads and its telephone and telegraph lines at the border, and its highways. I do not suppose there is any provision in our federal constitution that has conferred more benefit on the country than the clause which provides for free trade and free intercourse between the several states.

But there's a still more important phase of this subject—one that you have heard before, and will hear more of, and one that comes pretty close to your own interest. That is the question of government ownership. That question has not yet become a dominating issue which the power people have had to meet. It is in the air, and as the public imagination comes to grasp more clearly the economic elements of a general power supply, the very fact of this greater public interest will naturally incite political agitation.

There are today in this country more than 1,000 municipally operated electric power plants. Most of them are small and aggregate a meager portion of the total central station capacity. They do, however, constitute about 20 per cent of the total number of central stations. A few of them, where they are

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large in size and of modern design, are efficient plants. Most of them are economically indefensible. They constitute less than 4 per cent of our total central station capacity. Within the past 5 years more than 800 of these small municipal plants have gone over to private ownership. The greater part of these plants have owed their existence to the mass emotion that political appeal so easily excites when it champions the people against the corporation. If the corporation can make money in serving the public, why should not the people save that money, that profit, and supply their own service at cost? Why not, indeed, if they can reach the same cost?

The public debt of the country—federal, state, county and municipal—is about $35,000,000,000. This debt would be more than doubled if the government took over all the utilities. Also the present per capita tax of nearly $100 which we now require for the cost of government would be greatly increased. The proponents of the public ownership idea argue that the government could raise the money at less cost by the issuing of tax-free bonds. True, but where would the money come from which private ownership now pays to the government in taxes, some $665,000,000? Government must go on. The people must support it in one way or another. So increased taxes would have to supply the deficit.

Now, gentlemen, we have forged ahead under the rule of private initiative, the law of the survival of the fittest. The public must be protected both as customers and owners of our utility companies. They are protected by government control and regulation. But government operation has never proved its case, either in theory or practice.

We have already made a good beginning with superpower. Such a system already stretches 600 miles across the Southeastern states, representing the co-operation of seven different companies. California is wired up practically continuously throughout its length. In other sections of the country other systems are taking form. Presently a few great systems will cover the whole United States. Ultimately we shall have a system of universal power supply. We must have it, for it seems to be the one agency with which we can meet our increasingly difficult economic conditions. Its fullest national development is an indispensable element in our future prosperity and happiness.

Uniform Traffic Laws Proposed*

By George M. O'Connor
Claim Attorney Detroit United Lines, Detroit, Mich.

WE ARE, of course, chiefly concerned over the grade crossing situation as it confronts the interurban electric railways, and the seriousness of our problem can best be appreciated by realizing that there are today some 200,000 level grade crossings along the interurban routes. Through municipal development and annexation, these are increasing at the rate of 2,000 per year. Separation of these grades will cost on an average of $10,000 each, necessitating a total expenditure of $2,000,000,000. The interest alone on this sum of money at 5 per cent amounts to $271,000 per day, so that the financial impossibility of speedily undertaking the work and keeping pace with it is evident.

Available statistics show that of all accidents, automobiles are involved in more than 75 per cent. Observations taken in 1924 of 306,000 motor drivers approaching railway crossings showed that less than 3 per cent brought their vehicles to a stop. Some 20 per cent looked in both directions, the same number looked one way, and the balance trusted to luck, stepped on the gas and went across.

Accidents arise principally from three causes, namely, incompetency, recklessness and carelessness.

Not all persons are qualified to drive motor vehicles even though they have a knowledge of the laws governing traffic on the highways and are familiar with the workings of a motor vehicle, and the experience of many electric railway companies in their labor employment departments is that but one man out of three can qualify as a motorman. Yet the state will issue a license to drive an automobile without question; the defects which would disqualify the motorman are not considered by the license issuing officer. This can and should be prevented.

You will ask me then how we are to stop accidents. I can answer this by saying that as soon as chickens learn how to cross the street they will stop being killed, as I believe that many motorists employ the same amount of brain power when crossing railroad tracks that chickens do when crossing the road in front of moving automobiles. Then you will ask how we may reduce accidents; this I can answer more easily.

Educate the people, commencing in public schools, following it through all societies that are engaged in accident prevention, and especially interest the daily newspapers, which should be vitally concerned in giving the information impartially and fairly; then if the motorist does not learn or does not care to learn, have each state of the Union follow its sister states Mississippi, Virginia, Tennessee, Montana and North Carolina, in which states they have well defined "Stop Laws" with penalties, and grade crossing accidents are nearly nill.

I suggest and urge that the public utilities officials of each state adopt as soon as possible the following uniform traffic laws:

1. Make it a penalty for any motor vehicle to cross railway tracks without coming to a full stop.

2. Adopt a universal and distinctive coor scheme for lights at railway-highway crossings so that there can be no confusion as to what these lights mean.

3. Make crossing warnings universal as to design.

4. Prohibit the use by others of anything in the slightest indicative of railway crossing warnings, both in the form of stationary signals and whistles.

5. Prohibit all other signs or lights within a specific distance of crossings.

6. Require a rigid test, both physical and mental, of all applicants before granting of motor driver's license.

7. Prohibit the use of red lights on the rear of all motor vehicles except for stop signs and that a universal and distinctive rear light of some other color be used.

*Abstract of a discussion before the Central Electric Railway Association, Dayton, Ohio, Jan. 8-9, 1925.

New York Electric Railway Association

THE midwinter meeting of the New York Electric Railway Association will be held at the Hotel Commodore, New York, on Thursday, Jan. 22. The morning session will begin at 10 o'clock. There will also be an afternoon session. A banquet will be held at the Commodore in the evening. The two speakers at the dinner will be Clifford E. Paige, vice-president Brooklyn Union Gas Company, whose subject will be "A Changing Public Sentiment," and Dr. Warren W. Giles, who will speak on "Personality — the Business Man's Greatest Asset."

A list of the papers and discussions at the two sessions follows:

"High-Voltage Insulators and Their Relation to Radio, as Affecting Railways," by G. B. Smith, engineer Ohio Brass Company.

"Modernizing Fare Collection," by P. O. Lund, Eastern representative Johnson Fare Box Company.

"Interurban One-Man Operation, Tangerine Line," by J. M. Bosenbury, superintendent motive power and equipment Illinois Traction System, Springfield, Ill. The discussion on this paper, with illustrations, will be led by George L. Kippenberger, assistant general manager St. Louis Car Company.

"Light-Weight Interurban Cars," by W. J. Clardy, general engineer Westinghouse Electric & Manufacturing Company.

"Recent Developments in the Field of Gas-Electric Buses," by J. C. Thirlwall, railway engineering department, General Electric Company. The discussion on this paper will be led by J. A. Queeney, president Philadelphia Rural Transit Company.

"Freight Traffic—Its Source and Development," by Fred W. Brown, general superintendent Michigan Railroad, Grand Rapids, Mich.

"Essentials of Discipline," by F. S. Macy, physician in charge, Medical Bureau, Brooklyn-Manhattan Transit Corporation.

A report of the proceedings of the Accountants' committee will be presented by E. H. Reed, auditor Brooklyn City Railroad.

Indiana Utility Convention

A ONE-DAY meeting of the Indiana Public Utility Association will be held in Indianapolis on Jan. 22. The meeting will be held along with that of the Indiana Sanitary and Water Supply Association, separate sessions being held in the morning with a joint luncheon, a joint program in the afternoon and a joint banquet in the evening.

Among the speakers will be William

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H. Hodge, president Public Utilities Advertising Association, who will discuss the uses of advertising by public utilities; General George H. Harries, who will speak on "Our Obligations As Citizens," and W. S. Vivian of Chicago, who will discuss "Public Relations." Harry Reid, president Interstate Public Service Company, has called meetings of the managers and members of the Women's Public Information Committee at the same time.

"Transportation Night" in New York

SAFETY and transportation were the subjects discussed at the third regular meeting of the Metropolitan Section held in New York, Jan. 9. Difficulties in schedule making for a three-track elevated railroad where express and local trains running in one direction on two tracks must all operate in the reverse direction on a single track were told by S. D. Smith, superintendent Manhattan Elevated Division, Interborough Rapid Transit Company. To accomplish this every move has been studied and mapped, every motion synchronized and every man instructed how to do his part. Successful operation results from thorough co-operation from top to bottom of the organization. A discussion along these lines was given by D. O'Rourke, trainmaster of the same company.

Safety and public relations was the subject of a paper by T. P. Brannon, Long Island Railroad. He said that last year this railroad carried 92,000,000 passengers on 395 miles of track in "comparative safety." C. E. Hill, safety engineer New York Central Lines, said that 90 per cent of all accidents are due to the human element. Education is the remedy. Safety work was started 12 years ago on this railroad and in the eleven years since it was begun has resulted in saving the lives of 1,450 employees and preventing 57,000 injuries.

Martin Schreiber, manager Southern Division Public Service Railway of New Jersey, spoke about methods of selling transportation. He mentioned in particular four points. First, the rolling stock should be attractive in design and appearance. In the second place one-man operation, where a single trainman is in complete charge of the car, appeals to the public. Third, having a single man on the street in charge of all phases of the operation of a single line is likely to improve the quality of the service on that line. Fourth, advertising is necessary in order to sell transportation.

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, said that from the study of machines industry has turned to the study of men. Time was when, in dealing with men in the mass, leaders of industry failed to consider man as a human factor. Now, however, the employee is looked upon as a co-operative unit with a brain distinguishing him from the inanimate material units which he utilizes in the interest of himself, his employer and of mankind. The objective in personnel work in any industry is to enlist the maximum co-operation and interest of the human element in the success of the undertaking. To secure the co-operation of your employees you must remember that all are human beings and every effort should be devoted to harmony and co-operation.

Musical selections were heard between the talks and Conrad Young entertained the audience with a humorous monologue. A. L. Hodges, secretary of the Metropolitan Section, announced that the membership had increased from 726 at the time of the previous meeting to 771 at present.

American Association News

New Headquarters for A.E.R.A.

THE headquarters office of the American Electric Railway Association is to be housed in the Johns-Manville building at 41st Street and Madison Avenue. Negotiations have been completed for engaging the entire 14th floor of this building, comprising 6,000 sq.ft., and the office will be moved some time prior to May 1, possibly as early as March 1. The removal will be announced later. This area compares with some 4,300 sq.-ft. at the present location at 8 West 40th Street, which is quite inadequate for present activities. An exceptionally good rate as prices go today was secured for the new office. The expense for the new space is not much greater than the present rental, which is on a lease taken out several years ago, except as represented by the increase in space. The association was considered to be very fortunate in the arrangements it was able to make.

Codification of Power Failures

THE personnel of the committee of the Engineering Association committee on codification of power failures has now been completed. The membership, as announced by President Clark, is as follows:

W. E. Bryan, superintendent of power United Railways of St. Louis, chairman.

Representing the committee on power generation and conversion: H. T. Connolly, Annapolis, Md.; C. E. Bennett, Atlanta, Ga.

Representing the committee on power transmission and conversion: Adrian Hughes, Jr., Baltimore, Md.; W. J. Quinn, New York, N. Y.; N. R. Love, Denver, Colo.

Purchases and Stores and Stores Accounting

A JOINT meeting of the purchases and stores committee of the Engineering Association and the stores accounting committee of the Accountants' Association was held in New York on Jan. 12 and 13. Methods of co-operating with other purchasing agents' associations were discussed. It is planned to send representatives to Washington for the coming conference concerning the adoption of standardized invoice forms.

After considerable discussion concerning the advantages and disadvantages of a central storeroom, it was the feeling of the committee that such a plan is desirable. Centralized storekeeping arrangements on a number of railways were described, among them being that of the Philadelphia Company, holding company for the Pittsburgh Railways. It was felt by the committee that it is poor policy to rely on the manufacturer to keep on hand a stock of emergency material. In spite of the expense, it was thought that the railways should keep these supplies in their own storeroom.

Standardization of forms was approved for the purchase requisition, purchase inquiry, purchase order, and some sort of a record of receipt of goods. The committee felt that it would be undesirable to recommend carrying standardization beyond this point at present. Co-ordinating purchases of materials and supplies with the annual budget was discussed. It was decided to recommend that the purchasing agent should notify the budget officer of the company periodically of the total value of purchase orders signed. This notification has been found helpful.

Cleveland was selected as the location of the next meeting, which will be on March 23. The June meeting, for which a definite date has not yet been selected, will be held in Boston.

Those present were: H. H. Lloyd, chairman; J. Y. Bayliss, J. Fleming, C. A. Harris, A. E. Hatton, A. C. Kennedy, P. F. McCall, A. A. Ordway, and F. L. Wheaton of the purchases and stores committee. The stores accounting committee was represented by R. A. Weston and F. E. Wilkin.

Bolt, Nut and Rivet Standardization

A MEETING of the sectional committee of the American Engineering Standards Committee on standardization of bolts, nuts and rivet proportions was held in New York City on Jan. 8. Reports of various sub-committees included standard sizes of small rivets; sizes of tinners', coopers' and belt rivets; sizes of wrench head bolts and nuts, and wrench openings; sizes of slotted heads for machines and wood screws; sizes for track bolts, plow bolts and carriage bolts. The various dimensions proposed by the sub-committees were discussed and changes and revisions were made. After the tables have been corrected the reports will be printed and circularized for criticism.

A report was presented of an informal conference with foreign representatives of standardization bodies held on Oct. 28, by the staff of the American Engineering Standards Committee. Suggestions resulting from this conference were considered and a resolution was passed to provide for co-operation with all foreign standardization bodies.

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The News of the Industry

Amendment to Ohio Bus Law Is Sought

An amendment to the Freeman-Collister law, giving the State Public Utilities Commission control of motor bus transportation in the state, has been introduced into the General Assembly of Ohio now in session.

This amendment specifically takes out of control of the state commission buses operating wholly within municipalities and contiguous territory. The amendment was drawn to meet the needs of Cleveland, where the Cleveland Railway has been threatened with motor bus competition. It has the backing and support of legislators from all the larger cities of the state.

The amendment introduced into the Senate has already been favorably acted upon by the Senate automotive committee and will be voted on by the Senate during the week ended Jan. 24. Political leaders appear confident that the measure will pass. A similar amendment is also pending in the House.

Passage of the amendment by the General Assembly would prevent issue of a certificate of convenience and necessity by the State Public Utilities Commission to the outside motor bus interests which have been trying to get bus rights in Cleveland.

John J. Stanley, president, has publicly announced that the Cleveland Railway is willing to operate buses in Cleveland in accordance with the terms of the service-at-cost plan under which cars are operated in Cleveland.

Flexible Rates Will Be Recommended for Atlanta

Establishment of a flexible car fare in Atlanta, in accordance with the recommendations of the John A. Beeler Organization, will be suggested by the traction committee of the City Council at its next meeting and will probably be adopted by the street railway department of the Georgia Railway & Power Company. The schedule recommended will be "Schedule D," which provides for 10-cent cash fares, tickets four for 25 cents and a 5-cent fare for all school children under 12 years.

Should this schedule fail to check the losses sustained by the railway, and should the cost of service in the next 2 years exceed the gross revenue of the railway by 20 per cent, "Schedule E" would automatically become effective. This provides a 10-cent cash fare, tickets four for 25 cents, transfers given with cash fares only, and a 5-cent fare for school children under 12 years of age. If, on the other hand, the revenues of the department should show a sufficient increase, "Schedule C" would be put into effect. This makes cash fares 5 cents each, with free transfers, no tickets sold to adults, and tickets sold to school children at the rate of three for 10 cents.

The maximum charge provided in the schedule—"Schedule H"—consists of 10 cents cash fare, no tickets sold, free transfers, and 5 cents fare for school children. The minimum charge—"Schedule A"—consists of a 5-cent cash rate, tickets six for 25 cents, free transfers, children's tickets three for 10 cents.

It is pointed out that while the cash rates for adults is 10 cents under the new schedule, this is more than counterbalanced by the 5-cent rate for school children, making the actual cost of carfare per family smaller than at the present time. It is recommended by the Beeler Organization that jitneys be entirely eliminated from the streets of Atlanta.

Thompson Hampers Mayor Dever's Purchase Plan

Former Chicago Mayor Appears in the Role of the Man with Monkey Wrench in an Effort to Discredit His Successor's Municipal Ownership Aspirations

POLITICS, the specter which Mayor Dever has been fighting for months, finally has taken a good grip on the Chicago $450,000,000 transportation issue. As a result the Mayor, with his local traction chairman, Alderman Schwartz, has conceded defeat in his plan for a February referendum on municipal ownership. With this concession, Major R. F. Kelker, Jr., and his associates in the appraisal of the Chicago Surface Lines have pocketed the figures they had ready for the aldermanic committee and are quietly working out many details of the valuation which were slurred over in the first hasty summing up.

It was former Mayor William Hale Thompson, warm friend of Mayor Hylan, who began making a football out of the Mayor's plans. Discredited by a landslide vote two years ago at the end of a scandalous administration, Thompson has assembled part of his old machine and has announced a slate of Aldermen in about half of Chicago's wards, all running on platforms opposed to municipal ownership.

Other political complications followed. A Republican member of the traction committee accused Mayor Dever of forcing the committee Republicans to neglect campaigning so that Democrats could get busy and take away their wards. Finally Alderman Nelson, a labor mouthpiece and a Thompson candidate, saw Corporation Counsel Busch talking privately and separately to three Dever Aldermen.

"The corporation counsel is here lobbying among the members," Nelson said significantly to Mayor Dever.

"That's untrue," shouted the corporation counsel. "If I were elsewhere, I'd say it stronger."

Nelson, committed to Thompson's old 5-cent fare plank, wanted to know whether the proposed Municipal Railway Board could raise and lower fares.

"Yes, raise or lower them," Chairman Schwartz said.

"Never mind the lowering," retorted Nelson. "That board will be right on the job to increase fares to care for the certificate holders."

Other Aldermen, quiet during the first part of the ordinance reading, broke out vociferously when Chairman Schwartz came to the section bearing the $45,000 a-year plum of the Municipal Railway Board appointments. This probably will be around $125,000 a year when the tentative salary of $5,000 a year each for the board members is finally raised to a fitting figure.

Alderman Fick, learning that Council would not have an iota of control over the nine-member board, and that the terms would be nine years, denounced the section as autocratic.

"If these men go wrong," he demanded, "how can the common people understand it wasn't us who put them there? We have got to have the say on the three who represent the city."

"And the recall of all nine," added Alderman Mills.

"And cook up a most palatable political broth," broke in Chairman Schwartz sarcastically. "Every two years, when a bunch of new Aldermen come in, we'll have new board members. Why, it will take these men three years to become effective on the job. Give them a chance without this threat."

"The bankers have to concede us that," said Mills, "to protect their surface lines securities due in 1927."

Difficulties Augmented

Nothing was settled, except that the committee recognized the irony of a suggestion from Alderman McKinlay, representing the exclusive Beverly Hills district, who said that if the Aldermen couldn't trust the Appellate Court judges to decide the fitness of group C board members, he would have the section changed to read "school board" instead, inasmuch as Council ratifies school board appointments.

The Chicago problem has twice bobbed up politically in the state Capitol at Springfield, once in Governor

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Small's inaugural address, paving the way for the Small faction of the Republican party to take the issue away from the Democrats by juggling legislation, and again when wet Democrats from Chicago organized to beat the traction ordinance at the referendum.

The liquor interests took their stand because of Dever's crusades on speakeasies in which he closed 4,000 saloons on court orders. In their desire for revenge the wet representatives will stump the city, they announced, to upset the vote on the Mayor's project. They overthrew a dry as minority leader and henceforth will have control of minority legislation in the house. It is to these men that Dever will have to go for his special laws to cover the proposed purchase.

Under present conditions the outlook for the referendum is in the April judicial election, although the Mayor said a special election might be called sooner.

Terms of the Purchase Ordinance Summarized

An official summary of the ordinance, drawn up by Corporation Counsel Busch and Alderman Schwartz, its authors, was issued recently for publication. It ran to the extent of 38 column inches of newspaper space. The need does not appear to exist for the publication of this summary in full, but a restatement of some of the principal provisions may be of interest. Among other things the ordinance provides:

For the acquisition of the existing street railways and elevated lines by the issuance of municipal railway certificates pursuant to the terms of the 1903 and 1913 acts of the Illinois Legislature. The principal and interest of these certificates are payable solely out of earnings of the railway properties and the proceeds of any sale of the properties so acquired and cannot under the law be paid out of money raised by general taxation.

For the acquisition of the elevated "at a specific amount which can be increased only if the municipal railway board so recommends and the City Council passes an ordinance approving this recommendation and this ordinance is submitted and approved at a referendum."

For the construction of subways out of the traction fund and possibly by special assessment immediately after the passage and approval of the ordinance. The construction of such lines it would appear will depend on the success of the city in its negotiations to purchase the elevated lines, the routes of the new subway being governed by the ability to fit the lines into the general scheme.

For so tieing in elevated, surface and subway lines that they will all fit into a comprehensive whole.

For the acquisition of any other local transportation properties or any other means of local transportation, including buses, although not described in the exhibits attached to the ordinance, if the railway board so recommends and the City Council passes an ordinance approving the recommendation and the plan is sanctioned at a referendum.

For a depreciation and renewal fund to come out of the current earnings of the system.

For the segregation of all earnings of the railway lines in a fund separate from all the rest of the city's financial funds.

For a barometer fund to be kept at a fixed percentage of the total amount of the purchase certificates outstanding by changing the rate of fare in accordance with terms still to be written into the present tentative contract. The rate of fare, however, is always to be made sufficient to include a percentage of the earnings for the construction of extensions and the purchase of equipment.

For a municipal railway board to be appointed simultaneously with the issuance of the first certificates, this board to operate all of the local properties controlled by the city, but not to have charge of the construction of subway or elevated lines.

One-Man Cars Approved for Buffalo

Complaint of the City Dismissed by the Public Service Commission—Supplemental Rules Suggested by State Body—Ratio of Accidents to Car-Miles Cut Under One-Man Operation

THE Public Service Commission of New York on Jan. 9 dismissed the complaint of the city of Buffalo against the use of one-man cars by the International Railway in that city. At the same time the commission instructed the company to enforce two supplemental rules for the additional safety of passengers. One rule requires that in no case shall the operator receive fares, collect or count transfers, or make up his trip sheet while a one-man car is in action.

The decision of the commission accompanying the order points out that the investigation of its experts and the testimony presented at the hearings show that the ratio of accidents to car-miles operated has been reduced under one-man operation. In no case, says the decision, were any facts developed by the commission's investigation or presented at the hearing to show that any of the recent serious and fatal accidents in Buffalo were fairly attributable to one-man operation or would have been avoided by two-man operation.

During the period of one-man operation 914 accidents occurred with a service of 1,809,867 car-miles, or 5.05 accidents per 10,000 car-miles. During two-man operation 761 accidents occurred with a service of 1,504,118 car-miles, or 5.06 per 10,000 car-miles.

More than 50 per cent of all accidents were due to collision of electric cars with automobiles, it was brought out. Accidents resulting from other causes than collisions with automobiles have been reduced from 2.51 accidents per 10,000 car-miles under two-man operation to 2.21 accidents per 10,000 car-miles with one-man operation.

The commission points out that one-man operation has resulted in an increase in the number of cars on midday schedule from 52 under two-man operation to 69. The maximum number of cars operated under two-man schedule was 111. This number has been increased to 132 cars under the present schedule.

The strict enforcement of the two following rules is directed:

The operator of a one-man car must perform no other work than that of motorman unless the conditions then prevailing permit him to do so with safety. In no case, while a one-man car is in motion, shall the operator receive fares, collect or count transfers or make up his trip sheet.

If the operator leaves the car standing to throw a switch, a signal light, to telephone, or for any other purpose, the air brake must be applied in the emergency position; if standing on a grade, the hand brake must also be set firmly. When he leaves the car, operator must remove reverse handle from controller and take it with him.

The case arose out of the complaint in which the city of Buffalo alleged that one-man operation "increases the number of accidents to other vehicles and to pedestrians and decreases the headway of service." An investigation made by the street railway experts of the commission covered a period of several months and included riding and testing both one-man and two-man cars, investigation of all accidents which have occurred on one-man cars for the first eleven months of 1924, interviews with witnesses of all fatal accidents, examination into the methods of employment, instruction and discipline of operators and inspection and tests of the safety equipment, which is installed at the time that the cars are converted from two-man operation.

In addition the commission held public hearings at Buffalo on Dec. 29 and 30. At these hearings the city was represented by its law department and the company by its attorneys, and numerous witnesses were produced and testimony taken relating to the operation of one-man cars, including type and safety equipment of cars, operation, service, headway, rules and accidents. Executives of street surface railway systems, operating one-man cars in New York, Philadelphia, Boston, Albany, Schenectady and other cities, also testified as to the results of such operation on service and accidents.

The cars used in one-man operation in Buffalo are two-man "near-side" cars converted and completely overhauled from the track to the trolley wire. In addition to the circuit breaker on the platform, a line breaker has been installed under the car in compliance with the commission's recommendation. The air braking system is reconstructed and additional pilot, triple, emergency and operators' valves are installed.

The commission says that an added responsibility is placed upon a conductor or motorman who operates a one-man car. Two positions are consolidated into one, and this of necessity requires a better type of employee. To obtain this, supplementary physical and mental examinations are required, special tests are made and individual instruction of one-man operation forms a greater part of the student operator's course of instruction. There is an increase in wage of 5 cents an hour over the prevailing rate of wages paid conductors and motormen of two-man cars. In its comment on the case the commission reviewed the method of examination and selection of operators of one-man cars.

The commission comments on the company's rule which reads:

No act must be permitted to divert attention from the proper performance of duty while the car is in motion, i.e., unnecessary conversation, reading, lounging, looking backward, adjusting equipment, turning signs, stoking stove, attracting the attention of passersby, or any condition of mind or inattention to duty which may lead to an accident.

It says testimony taken tended to show that some operators collected fares and gave and received transfers while the car was in motion. The commission says that this practice should be strictly prohibited. In its opinion the judgment and discretion allowed individual operators by the rule above quoted can be more specifically limited by enforcing the two rules which were previously quoted.

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Municipal Men After Increase

The Municipal Railway at San Francisco, Cal., faces a new-year crisis in demands of the platform men for increased pay. The new wage scale submitted would increase the present rate from 67½ cents an hour to 80 cents for a 48-hour week, on a basis of 44 hours' actual work.

William H. Nancy, director of the San Francisco Bureau of Governmental Research, says the new wages, if granted, would give the municipal carmen more than the Market Street Railway men, who get 42 cents an hour at the start and 52 cents after three years of service with a 12½-hour maximum range of working hours.

Mr. Nancy declares he can foresee a possible wiping out of the Municipal Railway depreciation fund, with a financial crisis resulting if the city government meets the demands of the men.

There is much talk of a raise in fares from 5 to 6 cents. Adolph Uhl, manager of the recently organized City Efficiency League, is one of the chief proponents of the fare increase. He contends that if the proposed wage increase is granted the platform men the higher fare will be absolutely necessary. He gives figures showing that the road's yearly profits have been gradually declining from $88,965 in 1919 to $8,000 in 1924, owing to increased costs of material and labor.

Mr. Uhl claims that even if the supervisors deny the wage increase the Municipal Railway will still fall behind $150,000 in the coming fiscal year, due to increased costs and a recent adjustment made in the pay of the city carmen by charter amendment. He figures that this has added $200,000 to the road's annual expenses.

Another Suit Contests Dallas Fare

A hearing on the petition for a temporary injunction to restrain the Dallas Railway, Dallas, Tex., from charging a 6-cent fare will be held on Jan. 26 before the Sixty-eighth District Court. F. J. Geller, the plaintiff, asks that the officers of the railway be cited to state reasons why the 6-cent fare should be charged. He seeks a reinstatement of the 5-cent rate. He also asks that the property be placed in the hands of a receiver, be disposed of and that creditors be paid with the proceeds of the sale.

The agreement under which the present 6-cent fare is being charged by the Dallas Railway was to expire on Jan. 11, to which date it was extended from Dec. 27 to give John W. Everman, supervisor of public utilities, time to complete his plan No. 3. The plan specifies the extensions and new construction the city will demand shall be carried out by the railway company in return for a continuation of the higher fare.

The company up to a very late hour had not applied for the extension claiming that it would be difficult to borrow the money to make any extensions because of the suit pending before the Supreme Court contesting the right of the city to authorize a 6-cent fare in the face of the franchise voted by the people specifying a 5-cent rate. Both the suit in the federal court and the one in the District Court were filed by W. S. Bramlette, attorney for Mr. Geller.

Additional Railway Lines Suggested for Detroit

Prospects for additional railway lines for the city of Detroit, Mich., have been increased by the agreement reached with Robert Oakman for the completion of construction of the Oakman line, and by the furnishing of estimates asked by Henry Ford on the cost of the Warren Avenue link, which it is expected Ford will finance.

The Oakman line will run from Grand River Avenue to Michigan Avenue, the only physical connection with the D. S. R. system being at Grand River Avenue. At this point it will connect with the Northwestern Belt, which was also built by Mr. Oakman and has been taken over by the D. S. R. It terminates at the Ford plant in Highland Park.

Many of the Ford employees transferred from the Highland Park plant to the River Rouge plant have homes in Highland Park and the North Woodward district. This has led the Ford organization to seek a direct route between the two plants. When estimates were requested by Mr. Ford of the cost of the lines to the Rouge, figures were also included by the D. S. R. to cover the cost of work on the present single-track Oakman line to prepare for car operation.

The Oakman line will be completed and rented to the D. S. R. with an option to purchase. This line will be completed by Mr. Oakman. It is also expected that Ford will carry out his offer to finance and build a double-track line on West Warren Avenue from the present city limits to the Oakman line. This will connect the D. S. R. lines with the Oakman line at Warren Avenue, but the building of lines on Schaefer Road and Wyoming Avenue, for which Ford made inquiry for estimates, will probably be held in abeyance. The Oakman line is considered the first step in the program of railway construction for that vicinity.

The total cost of the proposed lines in which Mr. Ford expressed interest, exclusive of the Oakman line and certain track on Michigan Avenue that would link the Oakman line with the others, is estimated at $1,284,435. A statement of the cost was asked by Mr. Ford with a view to his financing the lines and then renting them to the city.

Certain lines in which Mr. Ford is interested would probably make it unnecessary to complete the Oakman line. It is understood that the lines to be built by Ford will be taken over by the city at cost less depreciation. The great expansion of the Ford industries in River Rouge has made it necessary to provide additional transportation facilities in that district just as soon as possible. Lack of funds on the part of the Department of Street Railways has made it impossible for the city to carry out the work at once without assistance.

Seven Cents in Binghamton

As soon after Jan. 15 as the Public Service Commission will give its approval and continuing one year thereafter the Binghamton Railway, Binghamton, N. Y., will charge a maximum fare of 7 cents within the city limits for each passenger. This is an increase of 1 cent over the present rates. This advance in rates is the result of an 8 to 3 vote of the Common Council following the submission of a report by a special committee. The company operated 50 miles of city and suburban railway.

The committee said that the company promised its employees an increase in wages of 2 cents an hour provided the higher fare was allowed. The report stated that the estimated expenses of the railway exclusive of pavement expenses of the year 1925 was $944,800; that the estimated daily income of the railway based on a 7-cent fare was $2,625, and the estimated daily expense of the company exclusive of paving costs was $2,588. These figures make no allowance for depreciation of any railway property.

The company paid $60,000 in taxes last year, of which $2,817 was paid upon property which does not produce any income.

At the time of the receiver's discharge, he had on hand approximately $90,000. This sum was accumulated in the last two and one-half years of the receivership. During this period nothing was paid to the receiver as salary or otherwise, and no allowance was made for attorney's fees.

Upon the discharge of the receiver on Feb. 23, 1924, this sum was turned over to the railway company and the company borrowed $75,000 more, making the total $165,000, but out of this amount the company was obliged, under the order of the United States Court, to pay $98,387 immediately for receiver's fees and allowances to various attorneys. This left a balance of $66,613, most of which was used to pay old creditors' claims, negligence claims and interest obligations maturing on May 1, 1924.

Members of New York Legislative Committees Named

In the New York Senate the Republican leaders have reduced the size of the public service committee this year from 14 to 12 members. This is the committee to which is referred measures relating to regulation and control of public utilities as well as amendments to the public service commission law. The make-up of this important committee, so far as the Senate is concerned, is practically all new. None of the Republican members of last year were named, and of the Republican appointments Senator Whitley of Rochester saw service on this committee 4 years ago. Warren T. Thayer of Chateaugay, a manufacturer, has been named chairman.

The Assembly public service committee retains its same chairman, Yale of Putnam, and its five ranking members as of last year. The chairman is a veteran legislator with fifteen years' experience in the Assembly.

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Cincinnati Traction Has No Responsibility in Franchise Issues

Neither the Cincinnati Street Railway nor the Cincinnati Traction Company is an applicant for a new franchise and the Cincinnati Street Railway alone assumes the responsibility of considering any question that may arise in connection with a new grant. These facts were emphasized on Jan. 8 at a meeting of the street railway committee of City Council of Cincinnati, Ohio. The committee had under consideration the tentative grant repudiated by the Mayor and his advisers last December. The reference to the Cincinnati Traction Company was contained in a letter received from W. Kesley Schoepf, president.

President Schoepf said that the Cincinnati Traction Company and the Ohio Traction Company now had an understanding with the Cincinnati Street Railway whereby the responsibility of considering any question that might arise in connection with the new franchise was assumed by the Cincinnati Street Railway in view of the fact that it alone would be the grantee in any ordinance passed by the City Council. For this reason he said it was unnecessary for any representative of his company to attend the meeting of the committee and that in not attending no discourtesy was intended. He said that his company when requested would furnish to the Cincinnati Street Railway any information it had respecting the operation of the street railway system. The meeting was the first to be held by the committee since the introduction of the proposed grant of a new franchise by Councilman William Hess, after Mayor George P. Carrel failed to comply with the Council's resolution to submit a report on the negotiations that have been pending virtually three years.

Councilman Frank Duttenhofer, chairman of the committee, in opening the session, stated that it was to be deeply regretted that the negotiations of the committee appointed by the Council a year ago were rendered nugatory at the eleventh hour, but that the regular committee of the City Council would attempt to continue the negotiations in the hope of evolving a franchise that would prove acceptable to the company and be approved by a majority of citizens.

The meeting was attended by city officials and representatives of the Mayor's private advisers, together with delegates from civic and improvement associations. W. C. Culkins, executive vice-president of the Chamber of Commerce, informed the committee that the special traction committee of the organization would make recommendations in relation to the franchise as soon as the investigation and report of Dr. Milo R. Maltbie, traction expert, had been completed.

Samuel Assur, attorney for the Cincinnati Street Railway, made a verbal statement on behalf of his client at the session. He stated that under the new ordinance the operating company would have to create a fare control fund of $400,000 immediately and that $200,000 of that would have to be exhausted in addition to approximately $237,000, representing one-sixth of the allowed return of capital, before the fare could be increased.

Taxi Operator Offers to Run Municipal Railway in Lincoln

Thomas H. Madigan, veteran taxicab proprietor of Lincoln, Ill., has surprised the City Council by offering to operate the local municipal railway as a private venture. He tendered the Council an annual rental of $300 for a period of 3 to 5 years. Originally, the railway was profitable and was operated for many years by a stock company. Ten years ago, the company failed and the City Council, rather than abandon the line, took over operation. By strict economy, it was possible to operate without a loss, but during the past year, the expenses have exceeded the receipts. In consequence the Council began considering the question of substituting buses for the railway. The Aldermen now feel that if Mr. Madigan is convinced he can operate the line at a profit and pay $300 rental, the city should be able to do so. Before accepting the new offer, the Council will investigate other phases of the situation.

More Bus Lines Planned at Detroit

Traffic studies are being made by the Department of Street Railways at Detroit, Mich., in various districts with a view to adding still more bus lines. Single-deck buses will be used largely, as the commission has given up for the present the idea of purchasing double-deck buses. A deadlock between the Council and the Street Railway Commission still exists relative to the purchase of the 50 buses, bids for which were asked and were first opened last fall. As noted in the ELECTRIC RAILWAY JOURNAL for Jan. 10 the Mack Avenue bus line was started by the Detroit Department of Street Railways on New Year's Day and two other new lines have been announced. Service was started on Plymouth Road on Jan. 1.

Columbus Property Questions Jurisdiction on Buses

The Columbus Railway, Power & Light Company has protested against the granting of a certificate to the Columbus Motor Bus Company, organized several months ago to operate buses from the center of the city to Bexley, a suburb. Counsel for the railway contends that the commission has no authority to regulate buses in home rule cities. This question now is pending before the Supreme Court of Ohio in cases from Youngstown and Cleveland.

The protest also declares that the Rail-light Company serves this territory adequately and is "amply able financially and by reason of proper equipment to give any additional electric railway service needed." If the bus company's application for a certificate is granted, the petition alleges, operating revenues of the Rail-Light Company will be impaired with irreparable injury to the public.

Commission's Findings on Oakland Accident Questioned

Officials of the Key System Transit Company, Oakland, and the California Railroad Commission are not in agreement over a report made by the board into the fatal wreck on the Key fill in Oakland the morning of Dec. 4. The report was based on investigations made by W. J. Handford, service superintendent. In it, the companies operating trains on the fill are ordered to reduce their speed from a maximum of 35 m.p.h. to 15 m.p.h., when the block signal system indicates caution and to keep inspectors on trains to see that these orders are obeyed.

The Handford report, based on evidence at several hearings, declared that the accident was due:

1. To failure of the motorman of the San Francisco-Sacramento train to comply with the special rule in the time-table of the Key System Transit Company, which requires that on passing an automatic block signal in "caution" position, the speed of the train shall be reduced so that a stop may be made prior to passing the next signal, should the same be in "stop" position.
2. To improper placing of signals in automatic block signal territory, under conditions where high-speed trains have been injected into operation under control of signals designed for a maximum speed of 35 m.h.p., resulting in inadequate distance being available in which the effect of the automatic emergency application of brakes can function, should a signal in "stop" position be passed by a motorman.
3. To lack of proper and definite supervision of trains running on joint tracks under contract.

Acting on this report, the board ordered the Key System Transit Company immediately to:

1. Reduce the speed of all trains operating within automatic block signal limits.
2. Issue a special time-table rule requiring all motormen to reduce speed at a block signal indicating "caution" to a maximum of 15 m.p.h., and to proceed thereafter with train under such control that a stop may be made before passing the next signal.
3. Make frequent checks as to compliance by all motormen of speed requirements.

Operate the block signal system between the outskirts of Oakland and the Key pier on the basis of two stop signals, one "caution" and two "clear" signals to be in the rear of a train, the second "clear" signal behind a signal indicating "caution."

When these orders were received, C. O. G. Miller, president of the Key System Transit Company, issued the following statement:

We deny that the Key System Transit Company was responsible for the accident on Dec. 4.

We deny that there was any lack of proper and definite supervision of trains and general laxity as to the important of train rules, operating regulations and special instructions relating thereto.

The Railroad Commission reached its decision without a hearing. Had the commission held such a hearing, as is customary in matters of this kind, and permitted the introduction of testimony, we believe it would not have made the report and order it did.

Mr. Miller further stated that at the present time an independent survey of the block signal system is being made by the company and if, as a result of this survey, changes are found to be necessary they will be made regardless of the commission's order.

Clyde L. Seavey, president of the commission, said in reply:

The order issued by the commission is specific and needs no further explanation. Mr. Miller could not have read the full decision. If he had he would not have made the statement he did. No further orders will be issued by this board unless the Key System Transit Company unduly delays execution of the original directions.

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Michigan Motor Freight Operator Not a Public Carrier

The difference between a public and a private carrier is clearly set forth in a decision of the United States Supreme Court rendered Jan. 12, 1925, in the case of the Michigan Public Utilities Commission, et al., appellants, vs. Coral W. Duke, doing business as the Duke Cartage Company. The Michigan law provides that no person shall engage or continue in the business of transporting persons or property by motor vehicle for hire upon the public highways of the state over fixed routes or between fixed termini, unless he shall have obtained from the Michigan Public Utilities Commission a permit to do so. This permit is issued only when the public convenience and necessity require it and may be withheld when it appears that the applicant is not able to furnish adequate, safe or convenient service to the public. It also puts all such operators in the class of common carriers, requires them to carry insurance for the protection of the property required by them, etc., and imposes a fee for the privilege of engaging in the business.

The Duke Cartage Company claimed it was not a public carrier, because its entire business consisted of hauling automobile bodies made at the plants of three manufacturers in Detroit to an automobile manufacturer at Toledo and that the company did not hold itself out as a carrier for the public. The court sustained this position. The court also said that a state may rightly prescribe uniform regulations necessary for public safety and order in respect to the operation upon its highways of all motor vehicles—those moving in interstate commerce as well as others and that a reasonable, graduated license fee may be imposed, but the state has no power to impose on interstate commerce conditions and regulations which are unnecessary and unreasonable. This would be done, it said, if it required this private carrier to become a common carrier, with its onerous duties and strict liability. The police power of the state does not extend so far.

Wisconsin Road Reduces Fares

Cash and ticket fares charged by the Wisconsin Traction, Light, Heat & Power Company on its interurban lines connecting Neenah, Menasha and Appleton and between Kaukauna and Appleton were reduced on Jan. 5.

The cash fare between these points has been changed from 20 to 15 cents, with no transfer privilege, however, to city cars. Very substantial reductions have been made in the cost of tickets and weekly passes. The 25-ticket rate of $4 has been discontinued and in its place a new book of 10 tickets for $1.35 will be issued. This is a saving of 2 cents per ticket. Passengers who use this ticket are permitted to transfer to and from city cars. Weekly passes are sold for $1.50 instead of $1.75. The former rate of 12 tickets for $1 for use in any 15-cent fare zone has been changed to 10 tickets for 75 cents, with transfer privileges to city cars.

These reductions in fares have been made possible through the increased use of the company's interurban service by the public and numerous economies in operation.

News Notes

Franchise for Interurban Operation Rejected.—The City Council of Niagara Falls, N. Y., has rejected the application of the International Bus Corporation, a subsidiary of the International Railway, Buffalo, for a franchise to operate Buffalo-Niagara Falls de luxe interurban buses over the streets of Niagara Falls. The company asked the right to operate over Buffalo Avenue, Erie Avenue, Falls Street and Riverway to the International traction terminal at Prospect Park. The City Council said there was no necessity for a Buffalo-Niagara Falls bus route.

Collectors Employed—Fares Reduced.—To relieve rush-hour conditions in the loading of passengers on its one-man cars the Public Service Railway, Newark, N. J., announced recently that it would place collectors on cars at traffic centers to receive fares. The company also announced a reduction from 8 cents to 5 cents in the fare on the last zone of the Bloomfield line and readjustment of its Kinney and Springfield lines in this city to absorb the line which now serves the Ironbound section. The rate change went into effect on Jan. 15.

Bus Operation Restrained. — Injunctions against seven bus operators operating lines connecting Providence and Attleboro, Crompton and Phenix and Woonsocket and Blackstone, Mass., have been granted in the Superior Court at Providence, R. I., by Judge Chester W. Barrows on petitions presented by the United Electric Railways and the New Haven road. The injunctions restraining the lines are temporary.

Cars Stop While Sun Hides.—Lucius S. Storrs, president of the Connecticut Company, has announced that operations on all the company's lines will cease during the total eclipse of the sun on Jan. 24. The order has been given to comply with the request of Prof. E. W. Brown of the Yale Astronomic Observatory, New Haven, Conn.

Seeks Public Help.—The United Railways & Electric Company, Baltimore, has called upon the public for suggestions in handling traffic during bad snowstorms. The company had printed a large number of folders containing an editorial from the *Public Ledger*, Philadelphia, which was headed "What Would You Do?" The public was asked to make suggestions to the company's service department. The same editorial also was reprinted in the newspapers in the form of an advertisement.

Denies City Officials Are to Blame.—The Corporation Counsel recently filed an answer with Arthur F. Simonson, lawyer of Stapleton, Staten Island, denying the responsibility laid on Mayor Hylan and members of the Board of Estimate of New York City for the death of Peter Champanis, who was hit by a trackless trolley on March 12, 1922. Mrs. Champanis brought suit for $75,000 damages, but when the suit was called to trial before Supreme Court Justice Strong in the Richmond County Supreme Court, Assistant Corporation Counsel Draper moved to dismiss action on the ground that the city was not liable, as the trackless trolley cars were being operated without a franchise. Later the complaint was amended making Mayor Hylan and the individual members of the Board of Estimate defendants. The recent answer denied responsibility and alleged Mr. Champanis was killed because of his own neglect.

Pending Settlement Buses Run. — Operation of buses between Alliance and Canton, Ohio, by the Stark Electric Railroad has been resumed under special permission granted recently by the Common Pleas judge. The buses will continue to travel pending a hearing on an injunction request. In a temporary injunction issued the company was restrained from operating buses in Alliance, Canton, or the highways between the two cities. At present the Stark Electric Railroad buses have been leased to Samuel Derenberger, Canton, who has a bus schedule filed with the state officials.

Railway Gets Bus Permit.—The Public Utilities Commission of the District of Columbia recently denied the application of the Bradbury Heights Motor Bus Line to operate a bus line between Hillcrest, Good Hope and the city, but authorized the Capital Traction Company to operate buses from the terminal of the railway line at 17th Street and Pennsylvania Avenue to and into the sub-divisions of Hillcrest and Good Hope. The rate of fare as stipulated in the order, which became effective Dec. 23, 1924, is the same as charged on the electric railway lines.

Suggestions Include Temporary Relief.—Several propositions have been offered in a report of the joint special commission on the subject of the widening of the Boston Elevated Railway structure at Cambridge Street, Boston, Mass. The report has been filed in the Massachusetts Legislature by the Department of Public Utilities, which with the Transit Commission made up the special board. A few suggestions included temporary relief. The commission recommends that nothing be done until the various propositions for the solution of the problem have received further consideration.

Fares Advanced.—The Public Utilities Commission of the Territory of Hawaii authorized some time ago an increase in the fare on the cars of the Honolulu Rapid Transit Company. The new rates are full cash fare 7 cents, token or ticket fare four for 25 cents and children's token or ticket fare three for 10 cents. The decision stated that if the 8 per cent return on the rate base established in this opinion was not produced after the first 12 months it was believed that the full return would be reached "and perhaps slightly exceeded in subsequent years."

Wants City to Control Utilities.—Mayor Frank X. Schwab of Buffalo, N. Y., has instructed Corporation Coun-

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sel Rupp to draw up a bill for presentation to the Legislature at Albany which would give to the city the control of public utilities within its boundaries, now exercised by the Public Service Commission. Problems such as Buffalo's one-man trolley car controversy, the Mayor said, would be taken care of in such a bill.

Services Rewarded. — Approximately 1,100 employees of the Wisconsin Public Service Corporation, Green Bay, Wis., who have been with the corporation a year or more recently received life insurance policies ranging from $500 to $1,000, according to the term of service. Those who have completed one year's service receive a policy for $500 to be increased $100 each year up to 6 years, when the maximum policy of $1,000 is reached. Those now employed less than a year will receive a policy for $500 at the completion of a year's connection. The insurance was placed with the Travelers' Insurance Company, which issued individual policies in favor of the employees.

Wants Permission for One-Man Car Operation. — One-man cars will be operated by the Illinois Central Electric Railway on the line connecting Canton, St. David, Bryant and Lewistown, Ill., and in the towns of Canton, Fairview and Farmington if the Illinois Commerce Commission approves.

Bus Petitions Denied. — The Public Utilities Commission of Connecticut recently decided against the petitions of J. F. Farr and Mascot, Inc., both of New Britain, Conn., to establish a bus line between New Britain and Hartford. The Connecticut company is prepared to supply the necessary service by operating buses between the points in question.

Seeks Higher Fare.—The Tide Water Power Company, Wilmington, N. C., has applied to the State Corporation Commission at Raleigh for Permission to increase city fares from 7 cents to 7½ cents, using tickets or tokens. The petition also asks for an 8-cent cash fare and a 10-cent local fare to Wrightsville Beach. In spite of every economy in operation, the Tide Water Power Company declares the inroads made by automobiles upon revenues necessitate a higher fare.

Tax Litigation To Be Settled.—In a hearing begun in the Superior Court at Seattle, Wash., the question will be decided whether King County is entitled to retain all the interest on the railway tax paid several months ago. The litigation, in which the Puget Sound Railway & Power Company, the city and county, were involved, lasted 5 years following the purchase of the local railway lines by the city. The county has divided the principal of the tax, amounting to $401,018 with the state, school, city and port, but Treasurer W. W. Shields, acting on the advice of Chief Civil Deputy Prosecutor Howard A. Hanson, is retaining all of the interest accumulated during the 5 years. This amounts to more than $250,000. George A. Meagher, assistant corporation counsel, asks that $113,725 of the interest be turned over to the city, and Assistant Attorney-General Donald Fraser makes a similar demand for $33,214 on behalf of the state.

Foreign News

London Underground Program Improves Service

The extensions and improvements of the underground system of London, England, are gradually coming into use, so that better service is being introduced on the lines of the Central London, Great Northern & Piccadilly, Baker Street and Waterloo and the Metropolitan District Railways. The southern section of the City & South London Railway was reopened Dec. 1, on the completion of the work of enlarging its tunnels.

Other factors in the rehabilitation program are the addition of new rolling stock, improvements in signaling and train-starting arrangements and the installation of a new 15,000-kw. turbo-generator at the Chelsea power station. Fifty new cars are soon to be delivered to the Metropolitan District Railway. Various station improvements now completed or nearing completion have already been mentioned in the ELECTRIC RAILWAY JOURNAL.

Practically all the underground lines are maintaining much shorter headways than heretofore and during the rush hours are operating additional trains or adding cars to the regular trains.

Transportation in Glasgow, Scotland, to Be Improved

Important developments in passenger transportation were dealt with by Glasgow Town Council recently. It was recommended that Parliamentary permission be sought for station and other improvements on the subway recently purchased, which are necessary if the subway is converted from cable to electric traction, as proposed. Another change is improvement of curves on the subway to permit higher speeds of cars. Loop lines or sidings for repair work are also contemplated.

By electric traction it is believed that the maximum speed of trains can be raised to 30 m.p.h., as compared with 12 m.p.h. with the cable system.

The development of bus services was also recommended.

British Tramway Wages Settled

The controversy between the British tramways and the Transport & General Workers Union was settled Nov. 13 by the National Joint Industrial Council unanimously adopting the report of the special tribunal. This tribunal was set up to investigate the claims of the employees in regard to classification, grouping of tramway undertakings and increase in wages.

The report recommended classification and maximum and minimum wages for each class, so adjusted that no man should receive an increase of more than 1s. 6d. a week above the present rate. Extra pay for night work was recommended and it was also proposed that new scales should be stabilized until at least April, 1926. Besides adopting the award, the Council recommended that it be operative as from Nov. 18.

One of the employer's representatives said the settlement was one of the most satisfactory that had been reached in the history of the tramway industry and that it had been arrived at in a most amicable spirit.

New Electric Railway Planned in England. — Negotiations are taking place for the construction of the Worcester & Broom Railway, for which an act of Parliament was obtained several years ago. The new line when completed will form a direct route between Worcester and South Wales and between Blisworth and Cambridge, and beyond. It is proposed that stations be erected at Worcester, Broughton, Hackett, North Piddle, Radford, Dunnington and Broom. Some of these places are at present 6 and 7 miles from a railway station.

Pekin Sees Street Cars.—The walled city of Pekin, China, witnessed on Dec. 17 the inauguration of a system of street cars. Crowds gathered about the street for the trial run of brilliantly decorated vehicles which moved slowly through the city using overhead current. There are 30 miles of track. The plan is to run the system beyond the city walls. It is said that many thousand jinrikisha coolies are worried for fear the new transportation methods will affect their livelihood.

Glasgow Corporation Buys Paisley Tramway.—The tramway of Paisley, Scotland, a private company, was purchased some time ago by the Glasgow Corporation and is now being operated as a part of the municipal tramway system of Glasgow. Paisley is located about 6 miles from Glasgow and through cars operate between the two cities.

Paris Underground Increases Bond Issue.—The bond issue of the Nord-Sud Underground Railway, Paris, France, was increased 34,000,000 francs the last of October. In conformity with the agreement with the Paris municipality, the interest payments are to be deducted from the gross receipts and any deficit between the remainder and expenses will be reimbursed by the city of Paris. In case of the final purchase of the line by the city, the municipality will assume responsibility for payment of interest.

Bradford to Keep Weekly Pass.—The weekly pass is to be continued on the tramways in Bradford, England, but will now be non-transferable. Penny stages are also to be given a 6 months' trial. The tramways committee was in favor of abolishing the passes, but after a discussion with the Town Council the committee was overruled by three votes. It was stated that the income from passes in November was £1,526 a week, or about one-seventh of the gross income of the tramway.

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Financial and Corporate

New Income Ruling

Employees of Municipally Owned Utilities Liable for Taxes as Far Back as 1918

All employees of municipally owned institutions, such as water, light and electric railways, which are defined as acting in a proprietary rather than in a governmental capacity, are subject to federal income tax on their compensation. They will have to pay taxes on their incomes as far back as 1918, and the Bureau of Internal Revenue has notified collectors of internal revenue to compel the filing of returns over those years.

The ruling, far-reaching in its application, is based on court decisions in several sections of the country, which have held, in effect, that such institutions as were named were competing with private enterprise and should occupy a similar footing with respect to certain taxation features. Officials of the bureau declined to be definite in the application of the ruling, which was made by Solicitor Nelson T. Hartson, and the problem of enforcement has been left in the hands of local internal revenue collectors.

There are a dozen or more cases, involving similar questions, pending before the bureau, and it was the opinion of officials that final adjudication of these will aid materially in constructing and applying the law.

The Solicitor's ruling made these specific statements:

> In deciding whether or not any particular activity in which a state or municipality may be engaged is a governmental function, the attitude of the federal rather than the state authorities should govern.
>
> The compensation received for services rendered in connection with a municipally owned water system is not exempt from income tax.

As a result of the ruling and the expected decision on other similar questions in like fashion, every city or state or other political subdivision operating such quasi-public institutions, it is believed, will find it necessary to go through its records and provide the collectors of their districts with full information about their employees, present and past. From these, the collectors will be able to trace down the persons who hitherto had filed no returns, believing that they were not subject to the federal income tax because they were employees of institutions supposed to be exempt by law.

Knowledge of the bureau's ruling came upon a request by Senator Shortridge of California, who sought to obtain from Commissioner Blair reasons for the assessment of taxes on employees of the municipally owned water and light system of Riverside, Cal. The commissioner's letter to Senator Shortridge caused the bureau to make public the ruling.

Senator Shortridge announced he did not consider the letter as having ended the controversy, and that he intended to press the question in the hope of preventing the ruling being made final in its present form. He asserted that he was not satisfied with the authorities used by Commissioner Blair as the basis for giving the ruling retroactive effect.

The first reaction to the decision is heard from Seattle. It has been estimated there that 2,800 employees of the Seattle utilities, including employees of the Seattle municipal railway, are liable for the tax. Long before the Washington, D. C., decision, however, the matter seems to have been up for consideration in Seattle. In fact, injunction proceedings were instituted by Corporation Counsel T. J. L. Kennedy against the local collector in the federal court to prevent collection of such tax last spring, when notice was served on employees of the Seattle Municipal Railway that they must make income tax returns. The case was still pending when the ruling from headquarters was issued. The demand was made that the railway employees pay the tax, Mr. Kennedy said, on a ruling that the municipal railway was a proprietary business.

Bondholders Take Over Danbury & Bethel Property

The Danbury & Bethel Street Railway, Danbury, Conn., has been taken over by the first mortgage bondholders, mostly of Boston, Mass. William Sperry, New Haven, Conn., is general manager of the line.

Robert A. Manwaring, general manager of the New Haven Illuminating Company; William W. Walker, Shore Line Electric Railway, New Haven, and George R. Tweedy of Danbury, appraisers on the property of the Danbury & Bethel Street Railway, have returned figures to the Superior Court showing a total valuation of $529,981.

The receivership will be continued until such time as the court decides the priority of certain claims against the company and payment of the claims has been made in accordance with the court's findings.

New York Companies Doing Better

17,000,000 More Passengers Carried in 1923 than in 1922—Group Still Shows Deficit, but the Operating Ratio Is Down—Interesting Five-Year Comparison of Fares

OPERATING revenues of electric railways in New York State other than those in New York City for 1923 show an increase of approximately $700,000 over those for 1922, with a decrease in operating expenses of approximately $1,300,000. For the sixth consecutive year, this group of companies has failed to have gross income sufficient to meet fixed charges. The net loss for 1923 was smaller than in 1921 or 1922 and the operating ratio is more favorable. Analysis of the figures indicate that this better showing is the result of both increased operating revenues and decreased operating expenses and fixed charges. In its report for the year the Public Service Commission says that this may be attributed in part at least to the fact that with only one exception there were no serious interruptions of electric railway service because of strikes and the effect upon the riding public of those initiated in prior years is gradually disappearing. The number of passengers carried during the year 1923 (616,377,402) shows an increase of approximately 17,000,000 more than in 1922. There were 643,870,858 passengers carried in 1921 and 748,233,247 in 1920. These facts are all taken from the report of the Public Service Commission filed with the Legislature on Jan. 15.

During the year the receivership on the Buffalo & Lake Erie Traction Company's property was terminated, and a new company known as the Buffalo & Erie Railway was formed to take over and operate a portion of the former property. The urban portion within the city of Erie, Pa., has been included within a separate corporation to be known as Erie Railways. Operation of the urban lines of the Wallkill Transit Company within the city of Middletown was discontinued and bus service was substituted.

The commission has been officially informed that approximately 30 per cent of the motor buses sold during the past year were purchased by electric railway corporations. Such buses have been put in service upon lines designed to render service in recently developed territory in which there is a reasonable demand for service, which is too light to support the expenditure required for electric railway construction. They have also been put in operation within older sections of cities in which there has been inadequate service, or to sup-

STATEMENT OF DIFFERENT FARES CHARGED IN NEW YORK STATE OUTSIDE OF NEW YORK CITY

Item	1920 Cities	1920 Per Cent of Total	1921 Cities	1921 Per Cent of Total	1922 Cities	1922 Per Cent of Total	1923 Cities	1923 Per Cent of Total	1924 Cities	1924 Per Cent of Total
5 cents	19	33	16	28	15	26	13	23	13	23
6 cents	5	8	9	16	5	8	4	7	3	5
7 cents	24	43	16	28	24	43	27	47	24	43
8 cents	9	16	16	28	13	23	13	23	15	27
10 cents	..	....	..	....	..	....	..	....	1	2
Total	57	100	57	100	57	100	57	100	56	100

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RESULTS OF OPERATIONS OF ELECTRIC RAILWAYS IN NEW YORK STATE OUTSIDE OF NEW YORK CITY

Item	1921	1922	1923
Railway operating revenues	$42,824,208	$41,858,280	$42,530,753
Railway operating expenses	37,290,565	36,978,228	35,674,050
Net revenue railway operations	$5,533,646	$4,880,052	$6,856,704
Railway tax accruals	2,779,829	2,872,018	2,938,251
Railway operating income	$2,753,813	$2,008,034	$3,918,453
Net revenue, other operations	817,335	1,302,688	1,101,937
Non-operating income	1,086,074	924,942	854,571
Gross income	$4,657,220	$4,235,664	$5,874,961
Interest charges	8,548,575	9,034,475	8,620,343
Other deductions from gross income	642,060	694,362	623,402
Net income	Loss $4,533,411	Loss $5,493,173	Loss $3,368,784
Dividends during year	419,659	1,770,977	1,213,458
Passengers carried (fares and transfers)	643,870,858	599,080,364	616,377,402
Revenue car-miles	91,059,219	92,481,319	92,135,786
Mileage in New York state	2,001	1,990	1,971
Operating ratio	87.08%	88.34%	83.88%

plement present lines now overloaded. Such service has been rendered in Utica, Syracuse, Rochester and Buffalo. In the cities of Cohoes and Rochester, trackless trolleys have been installed. In this connection it is pointed out that electric railways desiring to engage in the motor bus transportation business have been obliged under existing laws to organize separate corporations for that purpose. The commission favors an amendment of the law so as to permit street railways to operate auxiliary bus transportation under such safeguards and regulation as may be proper.

The mileage decrease for the year is shown as 20 miles, of which approximately 18 miles was due to the abandonment of its entire road by the Orange County Traction Company. The commission says that in cases where sections of electric railways are abandoned, motor bus service is usually provided. The total of 1971 includes some of those roads over which operation has been discontinued and it is probable that some of these will be permanently abandoned.

In a proceeding instituted before the commission, entitled "In the Matter of the Application of the Village of Mamaroneck for a Prohibition Order against the Public Service Commission and New York & Stamford Railway" and later carried to the state courts, the Court of Appeals affirmed an order of the Appellate Division, Third Department, reversing an order of the Special Term (Howard, J.) denying the petition of the village of Mamaroneck for a prohibition order to restrain the commission from approving the tariff schedule filed by the New York & Stamford Railway. The decision holds that the authority granted to the commission by chapters 134 and 335 of the laws of 1921, amending the Public Service Commission Law, to modify rates of street railway contained in franchise with municipality was taken away by the enactment of chapter 891 of the laws of 1923, and that such authority did not continue for purpose of granting application made prior to June 1, 1923, the date on which chapter 891 of the laws of 1923 became effective.

The commission has again renewed its recommendation to the Legislature for the early enactment of detailed statutory provisions setting forth the extent to which the Legislature intends that the commission shall exercise regulatory powers over the operation and maintenance of bus lines. The commission says that its jurisdiction over bus lines is apparently expressly limited to the granting of certificates of convenience for the operation of such lines or routes outside of New York City. Unless this is the legislative intent it requests a modification of this provision so far as lines operating in and out of New York City are concerned.

$4,500,000 Financing Placed

Brooklyn City Railroad Equipment Issue and Interurban Note Issue Before the Public

Two issues of electric railway securities were offered to the public by Halsey, Stuart & Company, New York, during the week ended Jan. 17. They were $3,750,000 of Brooklyn City Railroad equipment trust 5 per cent gold certificates, series A, and $750,000 of Chicago, Aurora & Elgin Railroad two-year 6½ per cent secured gold notes.

The Brooklyn City Railroad issue was dated Jan. 15, 1925, and is due serially in equal amounts of $375,000 yearly until Jan. 15, 1935. The issue was priced to the public to yield 4.50 for the Jan. 15, 1926, maturity to 5.50 per cent for the Jan. 15, 1935, maturity. The certificates are to be issued under an equipment trust agreement and lease to the Brooklyn Trust Company, as trustee, whereby title will be held by that company to equipment costing in excess of $5,000,000, or more than 133 per cent of the principal amount of the issue.

The equipment will be operated by the railroad at a rental sufficient in amount to provide for the annual installments of maturing principal and "dividends" on the certificates. The title to all the equipment will remain with the trustee until final payment of principal and "dividends" on the entire issue.

It is explained that the equipment covered by the certificates is of the latest standard type for operation in urban service. It will consist of 335 double-end, four-motor, front-entrance, center-exit, double-truck, steel frame cars with complete safety-type control. Cars similar to the new ones are now being operated successfully by the railway.

EXCELLENT DIVIDEND RECORD

The bankers explain that the company has an uninterrupted dividend record since 1855 except for the period from October, 1919, to September, 1922. Cash dividends aggregating 10 per cent were paid during the fiscal year ended June 30, 1924, on $12,000,000 of capital stock then outstanding. The capital stock was increased to $16,000,000 by a stock dividend of 33⅓ per cent paid Sept. 30, 1924, which substantially offset the absence of dividends from 1919 to 1922. A quarterly dividend of 2 per cent and an extra dividend of one-half of 1 per cent was paid Dec. 1, 1924, upon the increased capital stock.

The Chicago, Aurora & Elgin Railroad issue is dated Dec. 1, 1924. The offering price was par to yield 6½ per cent. The notes are to be secured by pledge with the trustee of $1,000,000 principal amount of the company's refunding and improvement mortgage 6 per cent gold bonds, series C, due Dec. 1, 1934. Application to create both the issues of bonds and notes has been made to the Illinois Commerce Commission. The proceeds from the sale of the notes will be used to fund current loans and for additions and betterments. Thomas Conway, Jr., president of the railway, explains that for the twelve months period ended Oct. 31, 1924, gross earnings were $2,358,726. Net earnings during the same period before depreciation were $503,327 as compared with annual interest of $232,000 on the company's funded debt to be outstanding upon completion of the present financing.

Traffic Declines Again on Detroit Municipal Railway

The city of Detroit, Department of Street Railways, has given out operating statistics for the months of November and October, 1924, compared with similar months of 1923. The accompanying table shows the traffic and income figures.

CITY OF DETROIT, DEPARTMENT OF STREET RAILWAYS

	November, 1924	November, 1923	October, 1924	October, 1923
Total revenue from transportation	$1,597,608	$1,799,220	$1,680,926	$1,867,943
Total operating revenue	1,649,701	1,886,857	1,730,559	1,966,187
Total operating expenses	1,167,655	1,401,541	1,235,365	1,449,921
Net revenue from railway operations	$482,046	$485,316	$495,194	$516,266
Taxes and rent deductions	59,845	59,379	59,798	59,379
Net operating income	$422,201	$425,937	$435,396	$456,888
Total non-operating income	14,763	1,006	10,966	43,143
Gross income	$436,964	$426,943	$446,362	$500,030
Total deductions from gross income	402,719	366,364	415,349	378,045
Net income	$34,245	$60,579	$31,014	$121,986
Total car-miles operated	3,765,393	4,077,195	3,955,498	4,302,638
Total passengers carried	34,980,603	39,071,049	36,909,526	40,590,326

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Reorganization Likely Soon

Receivership of New York Railways May Be Lifted Feb. 1—Security Holders Reconciled

Difficulties among the several protective committees involved in the reorganization of the New York Railways, operating about 70 miles of line principally in Manhattan Borough, New York City, have been composed and it is expected the plan of readjustment will be declared operative about Feb. 1. The reorganization will be placed in effect substantially as drawn, only minor changes in regard to the method of the participation of security holders in the subsidiary lines having been made.

The proposed plan of reorganization calls for the acquisition by the new company, through foreclosures and creditors' sales, of all assets of New York Railways now in the hands of the receiver except such property now owned which is not used in the operation of the railway system. No assessments of any description are to be levied against any security, and new money required for purposes of the reorganization and for capital requirements is to be provided out of the proceeds received from the sale of non-operating assets.

The drastic reductions in capitalization and annual fixed charges by which it is proposed to establish the new company along sound financial lines follow:

FINANCIAL SET-UP OF SUCCESSOR TO NEW YORK RAILWAYS

Existing company:	Principal	Fixed Charges
Bonds—fixed charges	$39,425,198	$1,751,093
Stocks—dividend rentals	3,836,700	346,966
Total fixed charges securities	$43,261,898	$2,098,059
N. Y. Rys. adj. inc. bonds	30,609,487	1,530,474
N. Y. Rys. stock	17,497,060	.....
Total	$91,366,445	$3,628,533
New company:		
Total fixed charge bonds	$19,353,060	$967,500
New income bonds	19,435,472	1,166,128
Preferred stock—184,830 shares	No par	.....
Common stock—90,200 shares	No par	.....
	$38,788,472	$2,133,628

The *Wall Street Journal* says that operating results for the five months ended Nov. 30, 1924, after giving effect to the changes in maintenance allowances contemplated in the reorganized company, show good earning prospects. Substantial reductions were made in operating costs, particularly in the operation of power plant, and large additions made to gross income as a result of a cut in maintenance from 38 per cent of total transportation revenues to 25 per cent. The latter rate was adopted in accordance with the suggestions of expert engineers, and brought maintenance charges in conformity with maintenance charges effective on other electric railway systems.

Comparative operating statistics for five months ended Nov. 30, 1924, and 1923 are given in the accompanying table.

Gross income of $750,997 for the five months represents an approximate annual rate of $1,800,000. In the opinion of competent engineers testifying before the Transit Commission this amount can be increased by approximately $1,200,000 through various changes in operating methods and capital investments approximating $3,800,000. Whether or not earnings in accordance with these estimates are possible of immediate realization is uncertain; substantial increases appear entirely possible with able management of the reorganized properties, and ample funds for working capital are provided in the plan. It has been estimated that earnings in the first year of operation under the plan will cover all fixed charges, including interest on $19,435,472 of 6 per cent income bonds.

COMPARATIVE STATEMENT OF NEW YORK RAILWAYS FOR FIVE MONTHS

	1924	1923
Gross revenue	$3,543,581	$3,856,388
Operating expenses:		
Maintainance of way and structures	482,859	778,271
Maintainance of equipment	349,656	558,469
Operation of power plant	242,608	423,551
Operation of cars	1,092,901	1,138,165
Injuries to persons and property	266,405	281,419
General and miscellaneous expenses	165,255	201,117
Total operating expenses	$2,599,684	$3,380,994
Taxes	298,429	349,431
Total operating expenses and taxes	$2,898,113	$3,730,425
Income from railway operation	645,468	125,963
Non-operating income	105,529	116,001
Gross income (available for interest)	$750,997	$241,964

Bus Lines in Pennsylvania Taken Over by Electric Railway

Buses operated by the West Chester Transportation Company between Wilmington, Del., and West Chester, Pottstown and West Chester and West Chester, Norristown and Valley Forge and other points in Chester and Montgomery Counties in Pennsylvania have come under the control of the Peoples Transportation Corporation, a subsidiary of the West Chester Street Railway.

Through the acquisition of the holdings of the West Chester Transportation Company the new owners have obtained an additional fleet of 14 modern motor coaches, together with a large terminal building in West Chester. The structure is one of the largest there and is well adapted to the requirements of the bus transportation business, having been laid out to suit the purpose by the former owners.

The motor coach routes which were operated by the West Chester Transportation Company will be consolidated with the unified electric railway and motor coach system of the West Chester Street Railway Company and the Peoples Transportation Corporation.

Comprehensive plans for the betterment of the service and a rearrangement of schedules to afford more convenient and efficient service are being worked out and will be put into effect in the near future.

The story of the co-ordination of the bus and the railway in southeastern Pennsylvania by these companies was reviewed at length in the ELECTRIC RAILWAY JOURNAL for Nov. 22, page 881.

Sixteen-Mile Georgia Interurban Suspends

Service on the Atlanta Northern Railway, or Marietta interurban line, the stock of which is owned by the Georgia Railway & Electric Company, was discontinued on Jan. 14 because of losses resulting from unfair bus competition. The road has about 16 miles of track. The discontinuance of service was not precipitate. It followed an announcement made as far back as Nov. 21, 1924, in a letter to city authorities of Marietta, Smyrna and Atlanta and to county commissioners of both Fulton and Cobb Counties, that the road could no longer continue unless the bus as a competitor was eliminated. This announcement was repeated twice in statements before the City Council of Marietta, not as a threat but simply as a declaration of the inevitable fact that the inroads into the line's revenues soon would make a discontinuance of service necessary.

In the year 1923 the Atlanta Northern Railway failed to earn bare operating expenses, taxes, renewals and interest on debt by the sum of $19,500. Since the operation of buses began the railway receipts have decreased $202 a day, or at the rate of $73,730 a year, making the aggregate loss in operations at the rate of $93,200 a year. This means that it is costing $93,200 a year more to run the road than it is taking in. The attitude of the company is that the line cannot possibly resume operations until it is in a position to earn its way.

With the opening of the new concrete road from Marietta to Atlanta, a line of buses began operating between Marietta and Atlanta, running along the highway, over the streets of Marietta, Smyrna and Atlanta, crossing the bridge over the Chattahoochee River immediately parallelling the line of the Atlanta Northern Railway. These buses could only operate by the consent of the governmental authorities of Marietta, Smyrna and Atlanta, the County of Cobb and the County of Fulton. Any one of them could forbid the operation of buses over the particular section of road or streets under its several jurisdictions.

The railway respectfully suggested that in the public interest this ought to be done. It said that "to permit these buses to operate on a roadway provided for them at public expense, a large portion of which this company has itself paid for, over a bridge which this company built, taking away the revenue essential for the support of the railway service, is manifestly unfair to the Atlanta Northern Railway, and in the end would, as we pointed out to county and city officials in a letter on Nov. 21, 1924, mean the discontinuance of its operations." The railway further said:

> The buses operating without charge on the recently paved public highway built at public expense, free of cost to the bus operator, and running over pavements and bridges for which this company paid, free of any charge to the bus owner, resulted in grossly unfair competition with the interurban line. The bus charges only the full cash fare, depriving the interurban line of its profitable customers, leaving the interurban only the low-priced commuters. The company called attention to the fact that this would unquestionably increase the loss of the interurban line to such an extent that it could not continue to operate.

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Personal Items

W. E. Thompson Vice-President

Third Avenue Railway Official Made an Executive, but Retains Transportation Post

W. E. Thompson, for 6 years superintendent of transportation of the Third Avenue Railway, New York, has been elected vice-president of that organization. Mr. Thompson will continue in charge of transportation, following the line of activity in which he has specialized throughout his railroad career of more than 20 years.

Mr. Thompson has made a special effort toward the development of sound industrial relations in the transportation department and in fostering better public relations through immediate and tactful response to all complaints and suggestions. He was a leading factor in presenting to the people of the Bronx and to the city at large the advantages of the Third Avenue Railway's plan involving co-ordination of trolley and bus service with transfer privileges between the two, in connection with the proposed granting of bus franchises by the city of New York.

He is interested in every movement for the betterment of his own organization and the industry at large. He was most active and successful in the development of the new Metropolitan Section of the American Electric Railway Association and at the organization meeting of that section on Sept. 24, 1924, he was elected its first president.

Mr. Thompson was born in 1876 in Mecklenburg County, Virginia. After attending the local schools, at the age of 18 he entered industrial life in a tobacco manufacturing business in his native county. Before many years he entered the street railway business, starting at the bottom with the old Virginia Passenger & Power Company, Richmond, now the Virginia Railway & Power Company. After service on the cars, and as starter and inspector, he became division superintendent under S. W. Huff, now president of the Third Avenue Railway, who was then general manager of the Richmond company.

In 1908 Mr. Thompson was called to Brooklyn as chief inspector and assistant superintendent of transportation of the Coney Island & Brooklyn Railroad, again under Mr. Huff, who had left Richmond to become president of the Brooklyn company. In 1911 he became superintendent of transportation, and in 1914 when the Coney Island & Brooklyn Railroad was taken over by the Brooklyn Rapid Transit Company he was made superintendent of the Brooklyn & North River Railroad, which was jointly operated by the Brooklyn Rapid Transit, New York Railways and Third Avenue Railway. Mr. Thompson remained in that position until 1919, when he became connected with the Third Avenue Railway as superintendent of transportation.

A portrait of Mr. Thompson was published in the ELECTRIC RAILWAY JOURNAL for Oct. 4, 1924, at the time of his election to head the Metropolitan Section.

F. R. Coates Heads C. E. R. A.

Well-Known Toledo Official Elected President of the Central Association at Dayton Meeting

Frank R. Coates of Henry L. Doherty & Company and president of the Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio, was elected president of the Central Electric Railway Association at the meeting in Dayton, Ohio, on Jan. 9. Mr. Coates was formerly president of the Toledo Traction, Light & Power Company, where he resided, but he removed to New York about a year ago to assume general supervision over all of the utility properties of that company.

F. R. Coates

Mr. Coates' hobbies have been described as smiling, baseball and boating. His chief aim doesn't have to be described. It is making friends. As one of his immediate associates in the Doherty organization said of him, that company has in Mr. Coates a philosopher of the genuine type, whose good humor is impervious to such trifles as franchise troubles, street car strikes and delays in the receipt of equipment.

For a long time it was thought that Mr. Coates had no invulnerable spot, but that spot is said to have been discovered several years ago during the ninth inning of a game between his "Rail-Light," composed of men from the Toledo company, and a Cincinnati team being played to decide the national amateur championship. Just when two were on, two out and the score tied, someone sent a hurry telephone call from New York to Toledo for Mr. Coates and it was relayed to the ball park. After a while Mr. Coates' philosophic soul calmed down and he answered the phone.

Mr. Coates was born in Philadelphia on June 20, 1869. He was graduated from Lehigh University in 1890, and took a post-graduate course the following year. Mr. Coates found some time aside from his scholastic pursuits to interest himself in Lehigh athletics and captained the track team for two years, starred on the football eleven and class lacrosse team and managed the nine. To anticipate inquiries it had best be stated that Mr. Coates' activities with the track team consisted in holding the mile walk record. He began work as a rodman with the Baltimore & Ohio Railroad at Pittsburgh. By 1892 he had advanced through the ranks to supervisor of the Wheeling division.

In May of the next year he was made assistant roadmaster of the New York Division of the New York, New Haven & Hartford Railroad in charge of maintenance and new track construction, and in December, 1895, he hung his hat on the roadmaster's hook.

Still not satisfied, he jumped several more rounds, and in October, 1900, became chief engineer of the Chicago, Great Western Railroad. In May, 1904, he entered the engineering and construction business and built bridges for electric railroads and hydro-electric plants until December, 1909, the last two years devoting his time to the Stone & Webster Engineering Corporation. Then he was made vice-president of the Inter-Ocean Steel Company with headquarters at Chicago. He remained there until December, 1911, when he went to Toledo as president of the Toledo Railways & Light Company. At Toledo he had a large part in the settlement of the franchise matter. Behind that sentence, however, there is a big story, far too big to be told here.

During the Spanish War Mr. Coates joined the Fourth Connecticut regiment as regimental adjutant.

Mr. Coates is second vice-president of the American Electric Railway Association.

Roy W. Mathisson Appointed Auditor at Knoxville

Roy W. Mathisson was appointed auditor of the Knoxville Power & Light Company, Knoxville, Tenn., on Jan. 1. Mr. Mathisson went to the Knoxville property from Birmingham, Ala., where he occupied the position of chief clerk in the auditor's office of the Birmingham Electric Company. In 1915 Mr. Mathisson became general auditor of the Houston Lighting & Power Company, Houston, Tex., and remained there until 1917, when he entered the air service of the United States Army, with which he continued until January, 1919. In February, 1919, he entered the service of the Birmingham Railway, Light & Power Company, now known as the Birmingham Electric Company. He continued in that position up to the present time. Mr. Mathisson was born in New York City. He attended the public schools and high school in Birmingham. Later he took a course at the Alabama Polytechnic Institute, Auburn, Ala.

C. A. Briggs, who has held the position of secretary and auditor of the Knoxville Power & Light Company, will retain his position as secretary and in addition to his duties of that office will have other duties assigned to him.

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Harold E. West, a member of the Maryland Public Service Commission, has been made chairman of that body to succeed Ezra B. Whitman, who resigned the chairmanship. Mr. Whitman continues as a member of the commission.

Edward P. Bell has been appointed acting superintendent of overhead construction of the Chicago & West Towns Railway, Oak Park, Ill. The appointment was effective Jan. 1, 1925.

R. Colwell, superintendent of the Edmonton Street Railway, Edmonton, Alberta, since 1921, has been appointed traffic manager of the Winnipeg Electric Railway. The system at Edmonton is municipally owned and operated.

Paul Romig has been named superintendent of railways by the Menominee & Marinette Light & Traction Company, Marinette, Wis.; Wilfred Bellmore has been named supervisor of traffic, Oscar Carlander has been placed in charge of equipment and carhouse and John Burns in charge of rail equipment.

C. L. Fosters is chief engineer of the Laurel Light & Railway Company, Laurel, Miss.

Obituary

James A. Brett, electrical engineer and inventor and Cincinnati district manager of the Westinghouse Electric & Manufacturing Company, died on Jan. 8 at Hamilton, Bermuda. Mr. Brett was widely known in the electrical industry. Many of the first interurban electric railways in the East were constructed under his direction. After finishing school he entered the Sprague Electric Works of Mount Vernon as an apprentice, and did much of the early development work on electric railway apparatus. For a number of years he took an active part in the railway construction work both in the East and in the Middle West. He went to Cincinnati as manager of the Cincinnati district of the Westinghouse company in 1905.

Safford S. Delano, formerly of St. Louis and for the last 25 years treasurer of the American Car & Foundry Company, died at his home in New York City Dec. 27. With the organization of the car company in 1899, Mr. Delano went to St. Louis from Detroit to become treasurer of the new organization. In 1908 his headquarters were moved to New York. He was 68 years old.

Joseph E. Dozier, formerly general manager of the Nahant & Lynn Street Railway, died on Jan. 7 at Miami, Fla. Mr. Dozier started his career with the Atlanta Telephone Company in Atlanta, Ga., the city of his birth. He later went North and accepted a position with the New England Telephone & Telegraph Company at the Milk Street Exchange, Boston, Mass. In 1895 he was appointed manager of the Quincy exchange. Very soon after this Mr. Dozier became manager of the Nahant & Lynn Street Railway, which position he filled for 14 years with great success. He next became connected with the Northway Motor Organization of Boston and Natick.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Manufacturers of Ten Countries Contribute to Java Electrification

A typical example of the increasing participation of American manufacturers of railroad equipment in foreign fields is furnished in the case of the Java State Railways, which is planning to use modern cars and trailers for suburban passenger service on a section that includes the cities of Batavia and Meester Cornelis. To this work of modernization manufacturers in ten countries are contributing. They are the United States, India, Holland, France, Belgium, Cuba, Switzerland, Canada, Germany and England.

Makers of equipment in the United States are furnishing the major part of the electrical equipment, the ruberoid for the roofs, the devices for coupling in emergency to the existing steam trains, the vestibule buffers, the pneumatic door-operating mechanisms and the car seats.

The General Electric Company is electrically equipping 10 of the cars and the Westinghouse Company five. The other 15 of the 30 cars on order are trailers. The Electric Storage Battery Company, Philadelphia, is furnishing Exide batteries, and the J. G. Brill Company, Philadelphia, the car seats. The pneumatic door-opening mechanism is manufactured by the Consolidated Car Heating Company, Albany, and the ruberoid by the Ruberoid Company, New York.

India is furnishing the teakwood for the roofs. France is contributing the wood for the floors. The all-steel bodies are being built in Holland. The window glass, wheels and axles are from Belgium, and mahogany for interior trim from Cuba. Switzerland is supplying the wiring devices and Canada the asbestos linings. The truck springs are from Germany and the air brakes from England.

The trolley voltage is 1,500, direct current, and each motor car will carry a motor-generator set to supply 65-volt current for operating the control mechanism and air compressors, supplying the lights and charging the storage batteries. The so-called subway type of ceiling fan will be used in motor cars and trailers.

G. E. Orders Show Increase

Orders received by the General Electric Company for the three months ended Dec. 31 totaled $80,009,978, an increase of 7 per cent over a similar quarter in 1923, according to figures made public by Owen D. Young, chairman of the board of directors.

For the year 1924 the orders received totaled $283,107,697. This compared with $304,199,746 for 1923, a decrease of 7 per cent.

ELECTRIC RAILWAY MATERIAL PRICES—JAN. 15, 1925

Metals—New York

Copper, electrolytic, cents per lb.	15.125
Lead, cents per lb.	10.55
Nickel, cents per lb.	31.00
Zinc, cents per lb.	8.22
Tin, Straits, cents per lb.	58.50
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.20
Somerset mine run, Boston	2.125
Pittsburgh mine run, Pittsburgh	1.875
Franklin, Ill., screenings, Chicago	1.95
Central, Ill., screenings, Chicago	1.95
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$43.00
Standard open hearth rails, gross ton	43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.05
Tie plates (flat type), cents per lb.	2.425
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.025
Steel bars, cents per lb.	2.10
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.60

Hardware—Pittsburgh

Wire nails, base per keg	2.85
Sheet iron (28 gage), cents per lb.	3.60
Sheet iron, galvanized (28 gage), cents per lb.	4.75
Galvanized barbed wire, cents per lb.	3.55
Galvanized wire, ordinary, cents per lb.	2.60

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.18
White lead (100 lb. keg), cents per lb.	0.167
Turpentine (bbl. lots), per gal.	0.92
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	17.25
Rubber-covered wire, No. 14, per 1,000 ft.	$7.25
Weatherproof wire base, cents per lb.	20.00

Paving Materials

Paving stone, granite, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.67
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.10
Gravel, ¾-in., cu.yd., f.o.b. N.Y.	2.25
Sand, cu.yd., N.Y.	1.25

Old Metals—New York and Chicago

Heavy copper, cents per lb.	12.25
Light copper, cents per lb.	10.50
Heavy brass, cents per lb.	8.00
Zinc, old scrap, cents per lb.	4.50
Lead, cents per lb. (heavy)	8.75
Steel car axles, Chicago, net ton	$22.75
Cast iron car wheels, Chicago, gross ton	22.75
Rails (short), Chicago, gross ton	22.75
Rails, (relaying), Chicago, gross ton	26.50
Machine turnings, Chicago, gross ton	14.25

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Rolling Stock

Brooklyn City Railroad, Brooklyn, N. Y., has placed an order for 335 cars. In the design these cars are similar in nearly all respects to the 200 cars ordered more than a year ago except in seating arrangement. With the idea of getting passengers to move away from the doors the new cars will have longitudinal seats on one side and cross seats on the other instead of cross seats in the center and longitudinal near the ends. The same sunburst will be painted on the dashers that is now used in Brooklyn to indicate front-entrance cars. The detailed specifications of these cars follow:

Date order was placed	Dec. 23, 1924
Date of delivery	Commencing April, 1925
Builders of car body:	
150 Brill,	
100 St. Louis,	
85 Osgood-Bradley.	
Type of car	Front entrance, center exit, pay as you pass
Seating capacity	50
Weight:	
Car body	21,245 lb.
Trucks	11,000 lb.
Equipment	8,755 lb.
Total	41,000 lb.
Bolster centers, length	21 ft. 6 in.
Length over all	44 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	10 ft. 9 1/8 in.
Body	Steel, 0.25 copper bearing
Interior trim	Cherry
Headlining	Agasote and Nevasplit
Roof	Arch
Air Brakes	Westinghouse Traction Brake Company
Armature bearings	Bronze
Axles	Heat-treated
Bumpers	Hedley Anti-Climber
Car signal system	Faraday buzzers
Car trimmings	Statuary bronze
Center bearings	Oil retaining
Side bearings	Plain
Conduits and junction boxes	Sherarduct
Control	Safetv Car Devices Company
Curtain fixtures	National and Acme
Curtain material	DuPont Fabrikoid
Destination signs	Hunter
Door operating mechanism	National Pneumatic and Consolidated
Fare boxes	Johnson
Wheelguards	Root
Gears and pinions	Nuttall
Hand brakes	Peacock
Heater equipment	Gold
Headlights	Crouse-Hinds
Journal bearings	Plain
Journal boxes	Cast steel
Lightning arresters	Type M. P.
Motors	Four Westinghouse 510 A, inside hung
Paint	Devoe & Raynolds
Power-saving device	Arthur
Registers	International
Sanders	Ohio Brass
Sash fixtures	Dayton
Seats:	
150 Brill,	
100 St. Louis,	
85 Heywood-Wakefield.	
Seating material	Cherry slat
Slack adjuster	Type J
Step treads	Feralun
Trolley catchers	Ohio Brass
Trolley base	Ohio Brass
Trolley wheels	Columbia
Trucks:	
310 pairs Brill,	
25 pairs St. Louis.	
Ventilators	Railway Utility
Wheels	26-in. rolled steel

Track and Line

Wisconsin Railway, Light & Power Company, Milwaukee, Wis., will merge the Myrick Park and Market Street lines by building cross-over tracks running north and south at Third and Main and Fourth and Main Streets in La Crosse. Work on this improvement will begin as soon as weather conditions will allow for the laying of new track. The plan is to eliminate the perplexing traffic problem in the downtown section.

Stockton Electric Railroad, Stockton, Cal., has applied to the Railroad Commission for a certificate to exercise a franchise granted by the city of Stockton and to construct, maintain and operate an extension to serve the Fair Oaks district in the city of Stockton. The district is not now served by any railway.

Nashville Railway & Light Company, Nashville, Tenn., spent more than $500,000 during 1924 for extensions and additions to property. Of this amount $161,802 was used for reconstructing and improving tracks.

Power Houses, Shops and Buildings

Staten Island Rapid Transit Railway, New Brighton, S. I., has filed plans for the construction of a one-story local substation, near Sand Lane, estimated to cost $18,000. The company will also build a one-story substation near the Old Town Road, Glasmere, to cost about $16,000, and a similar station near James Street, Atlantic, to cost a like amount.

North Branch Transit Company, Bloomburg, Pa., it is reported, suffered the loss by fire on Jan. 6 of its carhouse, workshop and warehouse as well as cars, including the snow-fighting equipment. The loss is estimated at $150,000.

Trade Notes

Gramm & Kincaid Motors, Inc., Lima, Ohio, has organized to manufacture a complete line of motor trucks and buses. The organizers are B. A. Gramm, motor truck builder, and R. M. Kincaid, recently vice-president and general manager of the Garford Motor Truck Company.

Mitchell-Rand Manufacturing Company, New York, N. Y., announces among the 1925 changes in the organization the following: W. B. Stevens, formerly of the sales department, has been made manager direct factory sales department. R. E. Dunne has joined the sales force. He was for several years assistant manager of the New York Office of the Hope Webbing Company.

Truscon Steel Company, Youngstown, Ohio, has announced that Oscar W. Loew will assume charge of the advertising and sales promotion work effective February. Mr. Loew has had a wide experience in merchandising and marketing.

Union Switch & Signal Company, Swissvale, Pa., has received an order from the Pacific Electric Railway for materials for the installation of automatic block signaling through its Hollywood-Glendale Subway, Los Angeles, Cal., embracing 14 style "N" color light signals, with the necessary impedance bonds, a.c. relays and transformers for their control. In connection with this signaling, a new Union type "F" electric interlocking is being installed at the Fourth and Hill Streets terminal, Los Angeles. This plant will involve a 15-lever frame interlocking machine with the layout, including three single switches and four double slips, all of which will be operated by style "M" switch movements using 110-volt, 50-cycle alternating current. The Union Switch & Signal Company will furnish the materials and the field installation will be made by the railway company's signal construction forces.

Sangamo Electric Company, Springfield, Ill., has opened a direct sales office in Boston, Mass., in charge of Stafford J. King, who for the past 12 years has been the Sangamo sales engineer located in the New England territory. He will be assisted by W. H. Carpenter and R. D. Savage, who are at present also located in that territory. Leonard G. Hunt has been transferred to Boston to be associated with Mr. King. Both prior to and subsequent to his graduation from the University of Illinois Mr. Hunt was associated with the company, and for the last 3 years has been a district sales engineer with headquarters at the factory. A stock of meters and accessories has been placed in Boston to render adequate service in the New England territory.

New Advertising Literature

Heine Boiler Company, St. Louis, Mo., has issued a 35-page illustrated pamphlet entitled "Heine Longitudinal-Drum Boiler." The booklet is known as Bulletin No. 52.

Conveyors Corporation of America, Chicago, Ill., has issued a new bulletin describing the American high duty conveyor equipment of the steam jet type for handling ashes from power houses where machinery with large capacity is necessary. The company states that this conveyor is in successful operation in a number of large, well designed plants. The pamphlet contains 10 pages. It is illustrated.

General Electric Company, Schenectady, N. Y., has issued a 127-page volume called the Arc Welding and Cutting Manual. It is designated Y-2007. The volume is profusely illustrated. It is divided into three parts, the first devoted to general information on arc welding, the second to a training course for operators, and the third giving a number of applications of arc welding.

Foamite-Childs Corporation, Utica, N. Y., has issued "Correct Protection Against Fire," a 24-page booklet. The booklet is a popular treatise on fire protection for all sorts of risks, written in non-technical terms. The "A," "B" and "C" classifications of fires made by the Underwriters' Laboratories are defined and the proper safeguards for each class of fire are charted. This chart is a novel feature of the Foamite-Childs booklet. The text covers the characteristics of all the different extinguishing agents in detail. The size and type of extinguishers most suitable for use in the home, motor car, and all classes of industrial and institutional risks are illustrated and described in detail.

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New York, Saturday, January 24, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

HARRY L. BROWN, *Editor*

Volume 65
Number 4

"What Would You Do?"

OUT of the welter of editorials printed every day in the newspapers throughout the country there emerges every so often a message so poignant, so forceful, that it deserves wide circulation. A writer in the Philadelphia *Public Ledger* has risen to the occasion in an editorial about the fellow prone to kick about street railway service even in the face of those trying conditions that often beset the street railway management. The excuse for his comment was the recent severe storm in the East that played havoc with transportation everywhere and resulted in delays, disorder and general disruption of service. His plea is for fair play, the boast of the average American. He does not wonder that patience sometimes breaks under the strain of transportation delays, but he points out that the time is one "for philosophical endurance and for that give-and-take without which intercourse with our kind would often be intolerable."

The question that is asked is "What would you do?" The editorial is significant because its every line reflects the attitude which the writer asks his readers to observe. The United Railways & Electric Company, Baltimore, has reprinted it for distribution among its patrons, asking for their suggestion. The editorial, reproduced in full elsewhere in this issue, lends itself to a purpose of this kind.

Constantly increased use is being made by electric railways of similar expressions of editorial opinion. The particular editorial, less than 400 words in length, not only is fair in its presentation, but in it the writing virtues of clearness, force and simplicity are so compounded as to commend it to the thoughtful consideration of car riders everywhere.

Must the Railway Remove Snow from the Whole Street?

IN ONE of the large cities a very severe snowstorm recently brought all traffic virtually to a standstill. The manner in which the local railways suffered was particularly trying. The companies spent large sums of money to keep the tracks open. While their plows were effective, they piled the snow up outside the tracks and, of course, all vehicles traveled on the track area.

This unfortunately is the usual course of events, but in the case referred to the storm was so heavy that as this issue of the paper goes to press, three weeks after the storm, the snow at the sides of the streets on many of the car lines has not yet been cleared away by the city. Thus vehicular traffic has continued to occupy the trackway and has had the effect on railway schedules instanced by the following typical line.

Under normal conditions a car on this line makes 14 round trips of 40 minutes elapsed time each within the working day of a crew. Now, three weeks after the storm, a crew is making six round trips a day and the elapsed time per round trip is from 2 to 2¼ hours.

In a way it seems out of place to suggest adding further to the burdens already heaped upon the railway for its use of the streets. Yet such a serious slowing up of the service with its consequent large loss of revenue, gives rise to the question of whether it would not pay the railway to have special equipment to assist the city in removing the accumulation of snow at the sides of the streets along car lines. Some companies are already doing this through the use of specially equipped motor truck plows and snow loaders, but most of them have hesitated to engage in such extra work.

In the absence of such snow removal equipment, the tracks might almost as well not be cleaned either, because the cars are of no value to the public if their movement is reduced to a speed considerably below that of walking. In the case in point, the cars have been virtually empty much of the time, though ordinarily they are well patronized with a headway of about 2 minutes.

Making Transportation Extensions Pay Their Own Way

ALMOST everybody realizes today what a heavy price American electric railways have paid and are still paying for the old policy of building extensions almost as fast as residents and real estate interests demanded them. The price was made all the heavier through the policy of granting the same flat fare for the longer ride into thinner territory.

A few years ago, Cleveland, as the leader in service-at-cost, called the turn on this way of adding to the landowner's unearned increment at the expense of the general car-riding public by insisting that the persons benefited by an extension must be willing to help find the money for it through purchase of securities. More recently, Baltimore has gone still further with realty developers by asking not for assistance in finding capital but for a guarantee against operating losses over a period of years. In Madison, Wis., a similar guarantee against loss to the railway was provided in 1919 by a manufacturer who had built a new plant beyond the end of the car line.

Now the Department of Street Railways, city of Detroit, gives acceleration to this tendency with the announcement of the Baltimore principle as a definite policy for all demands for extensions. This may surprise those who believe that a municipally-owned transportation system is necessarily obligated to extend and extend without regard to the effect on its finances. Unlike a private company, the city gains an increase

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in tax values as a partial or complete offset to operating losses on the transport facilities that produce the increase in such values, but that is not a sufficiently good reason to throw financial caution to the winds and give the land speculator something for nothing. From a city planning standpoint, also, the idea suggests itself that through control of the transport body and the latter's surplus revenues, etc., the municipality can exercise praiseworthy pressure as to the character of new housing developments.

While the Detroit traffic survey article in this issue gives many further particulars, one thought should be put forward here in connection with these surveys: The Department is actually putting it up to the people who will do the paying to decide for what they will pay!

Not What Is Heard, but What Is Used, Is Important

ONE of the speakers at the New York Electric Railway Association meeting this week, W. W. Paige, emphasized effectively a point that might be taken to heart by all railway men. The value of the meetings to the individual is not in listening to the speakers, not in taking part in the discussions, nor even in presenting a paper. Neither is it in what is retained after the delegate gets back home. All of this is merely for the edification of the individual. But what really counts is what portion of what is learned is actually put into use.

The papers at this meeting were well chosen and well presented. The discussion was above the average. Moreover, practical topics were taken up that should prove an inspiration to those who attended, and also to those who read the report of the sessions in this issue. Let each person see to it that he digests the matter he has heard or read—and sees how much he can use effectively on his own property.

Light-Weight Cars Solve Difficult Interurban Problems

MODERNIZATION of interurban railway rolling stock was a topic of more than passing value taken up at the midwinter meeting of the New York Electric Railway Association held Jan. 22. The papers on recent types of light-weight interurban cars and the discussion which followed showed that there are great possibilities from their use in building new passenger business and reducing operating costs.

An important point is that the old idea that a minimum weight of 1,000 lb. was necessary for each mile per hour of maximum speed perhaps does not apply any more. Cars with not more than 75 to 80 per cent of the weight dictated by this rule are now operating with complete success at speeds of 50 to 60 m.p.h., according to one of the speakers.

The use of safety devices similar to those developed for city service have made it possible on some lines to operate these light-weight cars with one man. Combining a reduction in labor costs with lowering of other operating and maintenance costs, it has been found feasible to give much more frequent service, and so to attract riders who would not consider the long waits necessary with the heavier cars.

This is a development that merits attention on many other interurban systems, as in numerous cases seemingly hopeless operating situations may be retrieved and service retained where otherwise the property would have to be abandoned.

Divided Opinion Over Future of Boston Elevated

APPARENTLY a fight impends in the Legislature as to the future course of the state with respect to the operation of the Boston Elevated Railway. The period of public control expires in 1928. With this in mind a recess committee of the Legislature has been considering the future of that property and it has just reported in a divided opinion with a 5 to 4 vote.

The majority report recommends that no action be taken by the Legislature this year on the matter, pending further recess study of the whole problem; that no authority be extended the public trustees to obtain further capital and that the question of further additions and improvements be held in abeyance for another year as well as the matter of the continuance of public control. The salient feature of the minority report is that it recommends the immediate enactment of legislation to extend the period of public control twenty years. The majority says little can be done in the way of increased facilities or extensions without a further increase in local fares, if not also in the basic fare now fixed at 10 cents. For these reasons the majority believes that any increased capital expenditures should be made only with the utmost caution. The minority says it sees no reason for drawing such a conclusion from the present condition of the finances of the Elevated. With it all there is involved the question of providing a comprehensive metropolitan transit plan.

The reports and everything pertaining to the subject will be referred by the Legislature to the committees on metropolitan affairs and street railways, sitting jointly. Senator Warren, who signed the minority report, is chairman of the metropolitan affairs committee, and Representative Richards, also a signer of the minority report, is chairman of the street railways committee for the House. It is argued that this situation will likely result in a favorable report on the present minority report. The report would then go to the House Ways and Means committee of which Senator Shattuck, who wrote most of the present majority report, is chairman. It is believed he would fight to have that committee substitute the recommendations of the majority report.

This Boston situation is of wide general interest because in effect the merit of the state trustee plan of operating local railway systems is the issue. The outcome will be to determine whether the present plan will continue, give way to complete public ownership and operation, or revert back to complete private operation.

Not a Straphanger System

THE Denver Tramway Company has removed all straps from its car bodies on both city and interurban lines. This has been done in connection with increased service to impress upon the public that this was not a straphanger service but that the aim of the company was to provide a seat for everyone. Of course it is impossible to do this in the rush hours, and standees then can take hold of the handles on the car seats, all longitudinal seats having also been done away with. But there is something to the public psychology obtained from this removal of the straps.

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Surveying Suburban Traffic Wants

Detroit Department of Street Railways Now Determining Market for Trackless Trolley or Motor-Bus Extensions in Outer Areas—Choice of Transit Means and Guarantee Against Loss Put Up to Parties Interested—Careful Survey Methods Used to Estimate Revenues and Expenses

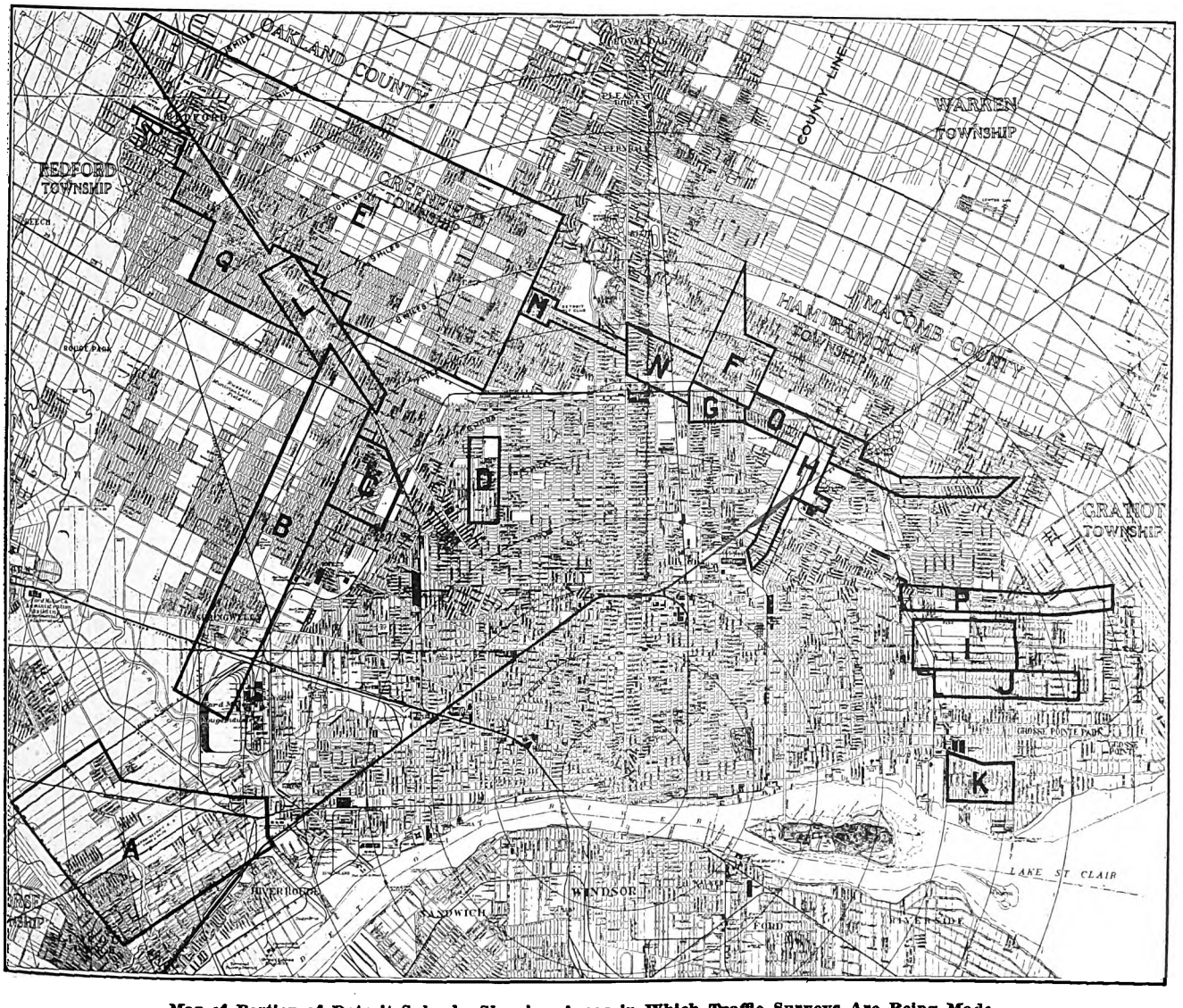
ACCORDING to the charter of the city of Detroit, its Department of Street Railways may, upon the consent of the local suburbs involved, extend its transportation service to points 10 miles beyond the municipal limits. During the first year or two, the department was too much occupied with the rehabilitation of the acquired system to meet requests for service from the outer districts, but with the worst of this work behind it the management is now able to give attention to the expansion foreseen in the charter provision.

If the department were to believe the enthusiastic forecasts of the realtors, the mileage of the system would increase by leaps and bounds. However, so long as the municipal street railway is conducted on a self-sustaining basis, progress must be made somewhat more cautiously. For this reason and because of the possibilities of using trolley, motor bus or trackless trolley for different situations, the Department of Street Railways has undertaken to solve the problem of extensions in a more thorough manner than has been customary in the past.

The plan is simple. Without drawing upon outside aid or adding largely to its operating expenses, the department is conducting surveys of district after district to determine three things: First, the market for transportation; second, the kind of transportation desired; third, the willingness of the local public to meet the cost of such transportation. The procedure is outlined in the following paragraphs.

Survey Staff Is Organized

On the map of Detroit and environs published herewith have been drawn the outlines of the different districts "A" to "Q" surveyed to date. It will be noted that they are of all shapes and sizes, aside from



Map of Portion of Detroit Suburbs Showing Areas in Which Traffic Surveys Are Being Made

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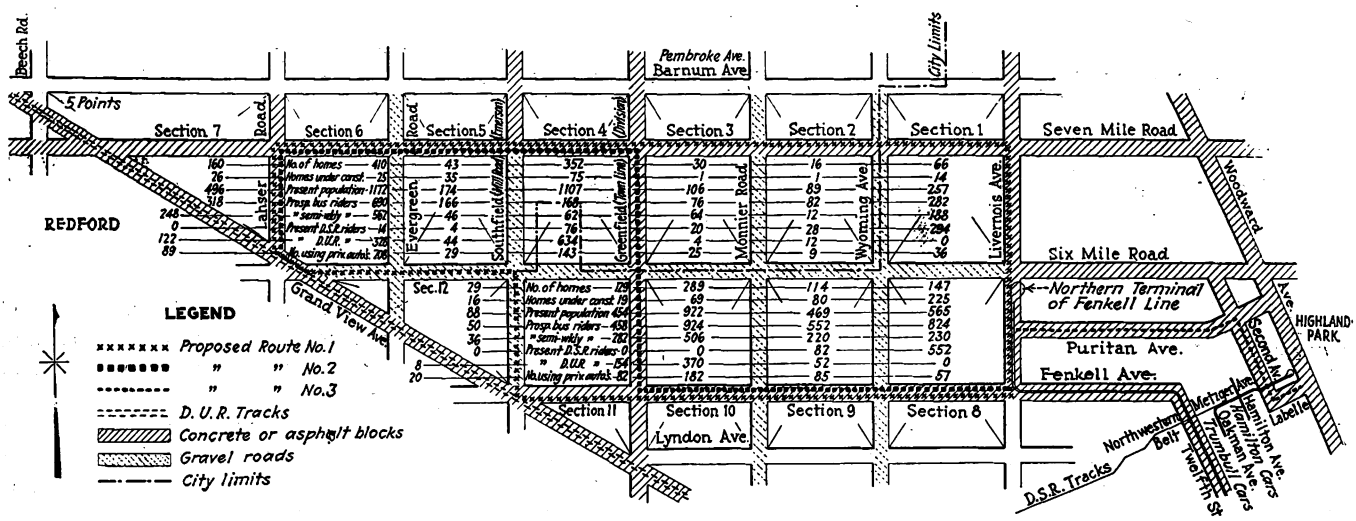
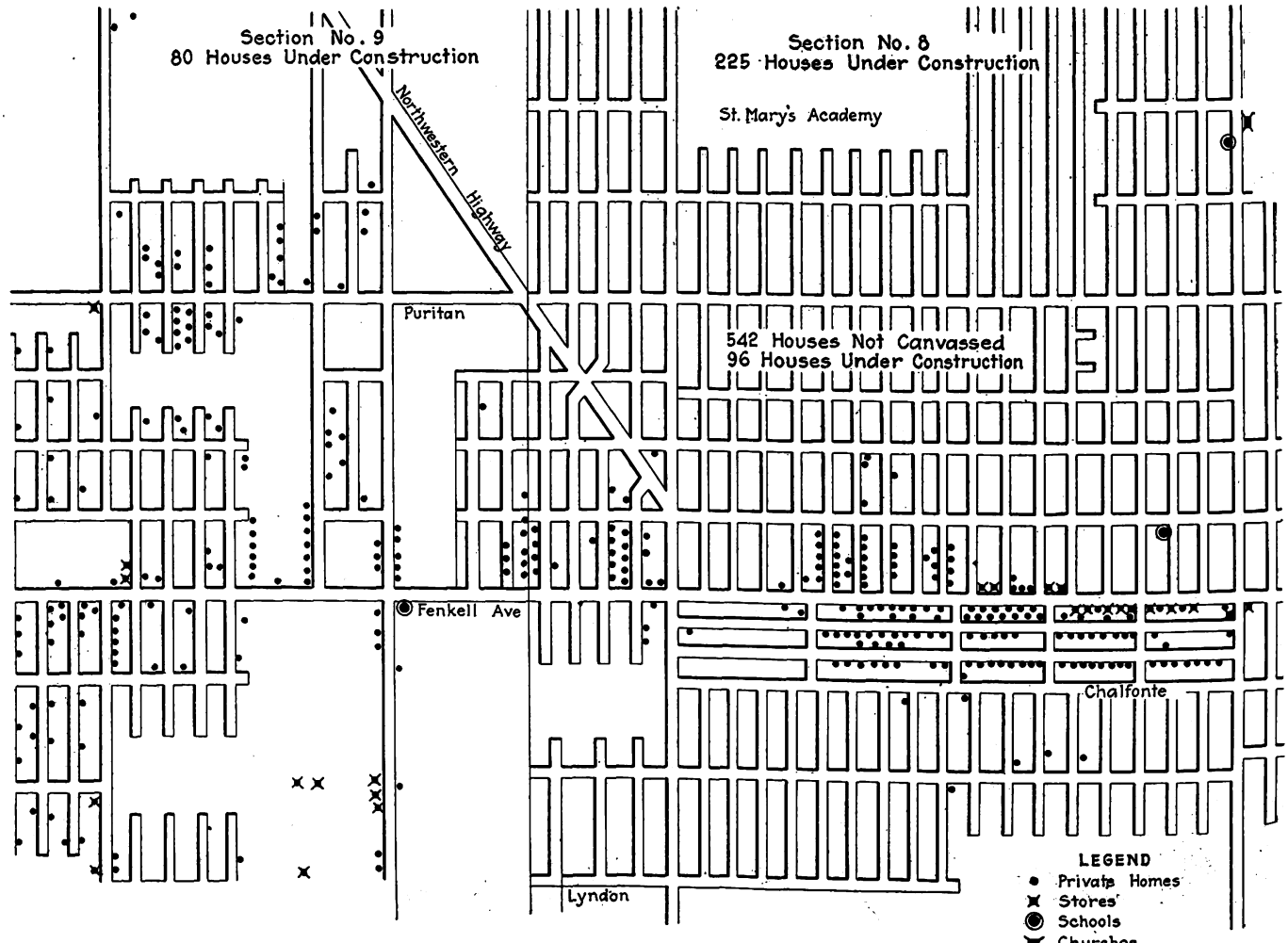


Diagram Used for Summarizing Results of Traffic Survey of College Park and Grand River Association Districts. The Sections Are 1 Mile by 1½ Mile

political overlaps. Each survey was undertaken at the request of interested individuals or associations in the territory with a D. S. R. traffic survey crew selected to make a house-to-house canvass. These crews have been drawn from the staff of the supervisor of traffic, from the electrical engineering division, from chauffeur forces—in fact, from any department where men of the right class were available. All of these investigators were placed under the direction of Frank Peppler, who acted as chief of the survey and as the usual speaking representative of the department at meetings and discussions with those who had urged extension of service to their territory.

One of the most detailed canvasses was that made in area E on the map, which is bounded by Seven Mile Road, Livernois Avenue, Fenkell Avenue and Grand River Avenue, an area of approximately 21 square miles. Through the economical methods employed by the department and the co-operation of the College Park and Grand River Associations, which are in the eastern and western parts of this district, the survey cost only $50 per square mile. As the methods followed were typical, an account of them will be given:

In the spring of 1924 these associations broached the matter of a conference on service. The suggestion was then made that the businesslike way to look into



Detail of Portion of Area E Showing Locations of Buildings

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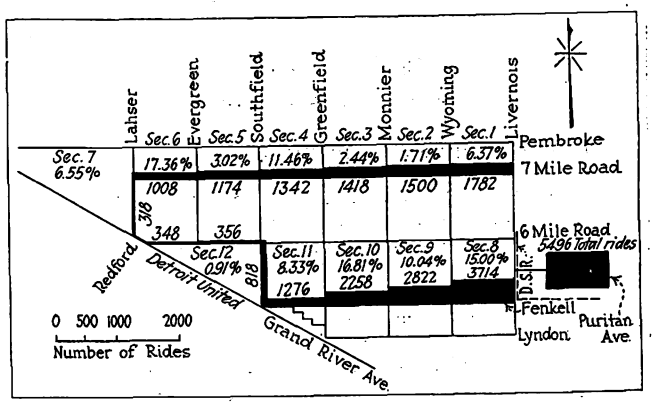
the matter would be to make a detailed survey. Thereupon, the department placed in the field a crew of six to eight men with three or four automobiles. These men made a house-to-house canvass, carrying with them a letter from Ross Schram, secretary (now general manager), and a short questionnaire, which are reproduced elsewhere. The questionnaire asks for the number of adults and children in the residence; the number of daily riders and the times they ride; the lines then used; the particular boarding places that would be used if routes were installed on certain streets; whether use is made generally of the personal automobile, motor bus, Detroit United Railway or the Detroit Municipal service.

In this particular case, trackless trolleys had been discussed. This accounts for the specific mention of trackless trolley buses in Mr. Schram's covering letter. As a matter of fact, the realty interests had expressed a preference for trackless over gasoline buses in the belief that the presence of a "dug-in" transport route would be more helpful in selling lots and houses than a mobile motor-bus route. While the department had no special choice in the matter, it was considered good policy to have every canvasser carry with him a photograph of a trackless trolley so that the householders would know just what they were voting for. This area, by the way, has one gasoline bus which gives rather sporadic service and so inclines the public toward something that is more tangible.

The field check covering the number of houses built or under construction in this area E was completed in about 10 days. One of the maps covers part of the area E, showing how the settlement data were tabulated under the headings of "private homes," "stores," "schools" and "churches." In cases where the houses were too numerous to spot separately, a number was used. From this information and from the answers to the questionnaire, there was prepared a corresponding locality map on which are shown by square miles, in relation to the proposed and existing routes, the number of homes in service, of houses under construction, present population, prospective daily bus riders, prospective semi-weekly bus riders, present Detroit United riders, present Detroit Municipal riders and present private automobile users.

In addition to these data, further graphs were prepared to show the expected densities of traffic along the streets corresponding to the proposed routes. One of these graphs is reproduced herewith. Incidentally, these graphs show how far most of the residents now have to travel to the existing trolley facilities of the Detroit United and Department of Street Railways.

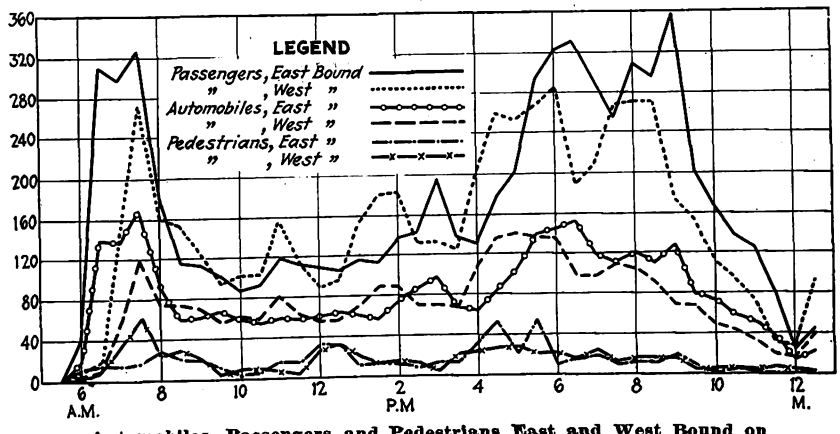
As a check on the house-to-house canvass, the department tallied the actual car, auto and pedestrian traffic



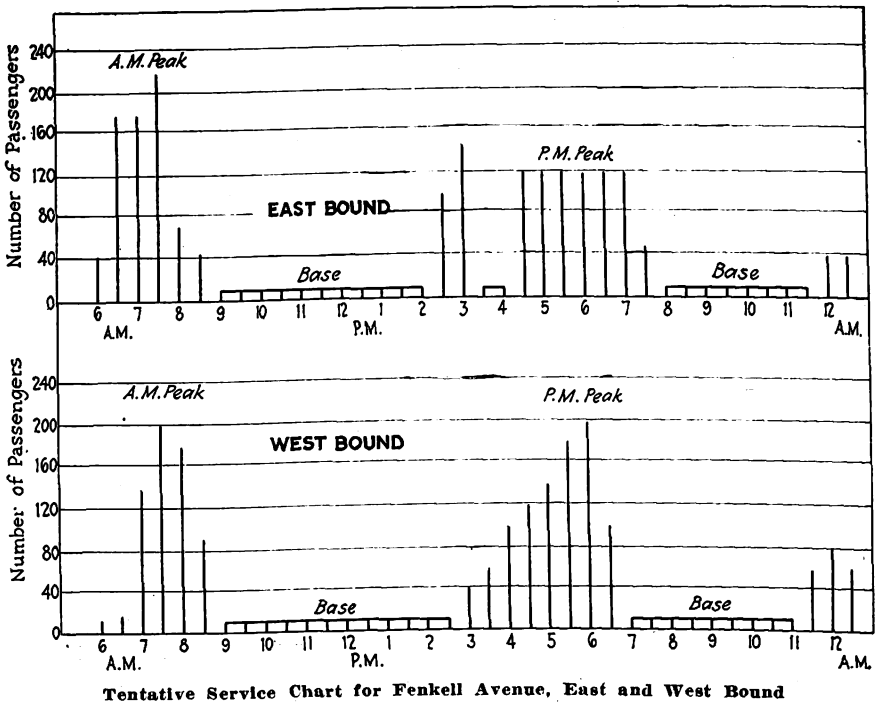
Estimated Density of Traffic Along Proposed Route No. 1
Large figures indicate prospective daily riders, and per cents indicate relative number of riders from each section

by half-hour periods on Fenkell just west of Livernois Avenue, as summarized in one of the charts. A similar summary was made for Seven Mile Road just west of Livernois Avenue. The automobile graph covers passengers.

When the foregoing data were submitted to the associations interested, the latter suggested study of the possibilities of a third route, viz., a line tying in with the Livernois route at Puritan, extending along Puritan



Automobiles, Passengers and Pedestrians East and West Bound on Fenkell Avenue Just West of Livernois Avenue



Tentative Service Chart for Fenkell Avenue, East and West Bound

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CITY OF DETROIT
Department of Street Railways

TRAFFIC SURVEY—NORTHWESTERN DISTRICT

The Street Railway Commission has been asked to make a complete survey of the residences in this vicinity for the purpose of laying out routes for the operation of trackless trolley buses.

In order to have complete and accurate data, the commission will appreciate your answering the questions asked by its representative.

BOARD OF STREET RAILWAY COMMISSIONERS,
ROSS SCHRAM, *Secretary.*

May 21, 1924.

Letter from Street Railway Management Transmitting Questionnaire

and down Second Avenue to LaBelle, to terminate at the Highland Park plant of the Ford Motor Company. This is designated as Route No. 3 in the map.

The next step was to make an approximation of the relative costs of gasoline and electric bus service for Routes 1, 2 and 3 in area E. The figures are presented in an accompanying table. They are based on general experience in a variety of places and include the following assumptions: 19½-hour service; 50 per cent standees in rush hours; power cost either 2.5 cents per kilowatt-hour or 2.6 cents per mile (6 miles per gallon) for gasoline. The annual gross expenses are higher for the gasoline bus, but not enough to suggest any noteworthy superiority of the trackless trolley on this account. The figures do not attempt to cover a possibly greater earning power of the more flexible gasoline bus that might offset the higher over-all cost. As part of this study, the department has conducted power demand tests of

TRAFFIC SURVEY—NORTHWESTERN DISTRICT

Date ..... 192..

Name ..... Address .....

Near .....

Number of adults in residence .....

Number of children in residence .....

Number of present daily riders ..... Time per day .....

.....

.....

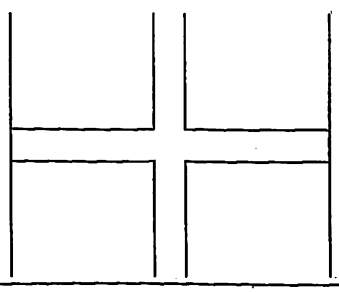
Lines used at present .....

Number who would use line on Seven Mile Road, Redford to Woodward Avenue .....

Number who would use line on Fenkell, Grand River to Livernois .....

In traveling to and from Detroit at present, what facilities are used? (D.S.R.—D.U.R.—Bus—Private Car) .....

Representative .....



Form of Questionnaire Submitted to Residents in Suburban Areas, Showing Street Plan

one and two-motor trackless trolleys. These will be described in a future article in this paper.

It is of interest to add here that later the Grand River Association asked that like studies be made in area Q, as already done for C, D and E, but in this instance a motor-bus catalog was added to the equipment carried by the interviewers to permit the public to see just what they would get with either trackless trolley or motor-bus operation.

Tentative service charts were prepared for Fenkell Avenue east and west bound and on Seven Mile Road east and west bound on the assumption that the service

DETROIT SURVEY, SHOWING INVESTMENT AND OPERATING COSTS FOR TRACKLESS TROLLEY AND GASOLINE BUSES ON SAME ROUTES

	Route 1		Route 2	
	Trackless Trolley	Gasoline Bus	Trackless Trolley	Gasoline Bus
Investment	$349,439	$211,000	$255,857	$173,000
Fixed charges	50,979	40,343	37,657	33,553
Operating expenses	159,279	178,240	112,062	125,413
Annual gross expense	210,258	218,583	149,719	158,966
Annual gross expense to provide sinking fund to retire bonds in 25 years at 5 per cent compound interest	217,589	223,004	155,080	162,591
Injuries and damages reserve (based on Detroit Motor Bus, 1923) $5.20 per 1,000 passengers	9,708	9,708	7,394	7,394
Buses required	20	20	16	16
Annual passengers	1,866,990	1,866,980	1,421,980	1,421,980
Base headway, minutes	15-20	15-20	15	15
Peak headway, minutes	5	5	7½	7½

TRACKLESS TROLLEY ON PURITAN, LIVERNOIS TO SECOND, AND SECOND TO LA BELLE

	Route 3	
	Trackless Trolley	Gasoline Bus
Investment	$43,246	$19,750
Fixed charges	6,229	4,017
Operating expenses	14,336	16,040
Annual gross expenses	20,565	20,057
Annual gross expenses to provide sinking fund to retire bonds in 25 years at 5 per cent compound interest	21,471	20,163
Number buses required	2	2
Annual passengers	Not estimated	

would be conducted with trackless trolley buses. The chart for Fenkell Avenue is reproduced. However, the interested associations named have not yet come to a decision as to trackless or gasoline bus as that is partially dependent on the ultimate routes and these in turn are dependent to some degree on the character of paving.

EXTENSIONS TO BE FINANCED ON SERVICE-AT-COST BASIS

It is obvious that the Department of Street Railways cannot undertake to finance and build immediately the large number of extensions desired, more particularly those developments which are being pushed by real estate interests in advance of normal, contiguous growth. For this reason the management has gone on record to the effect that a portion of the pioneering losses should be borne by those who will benefit from the enhancement of property values. The College Park and Grand River Associations have shown a disposition to agree with this idea.

The policy of the D. S. R. in having those most interested in extensions into new territory help pioneer the cost both of construction and operation is very ably seconded in the speeches made by Ezra B. Whitman, chairman of the Public Utilities Commission of Maryland, and L. F. Eppich, past-president National Association of Real Estate Boards, respectively, at the last A. E. R. A. convention. (Pages 596 and 628 of ELECTRIC RAILWAY JOURNAL for Oct. 11, 1924.)

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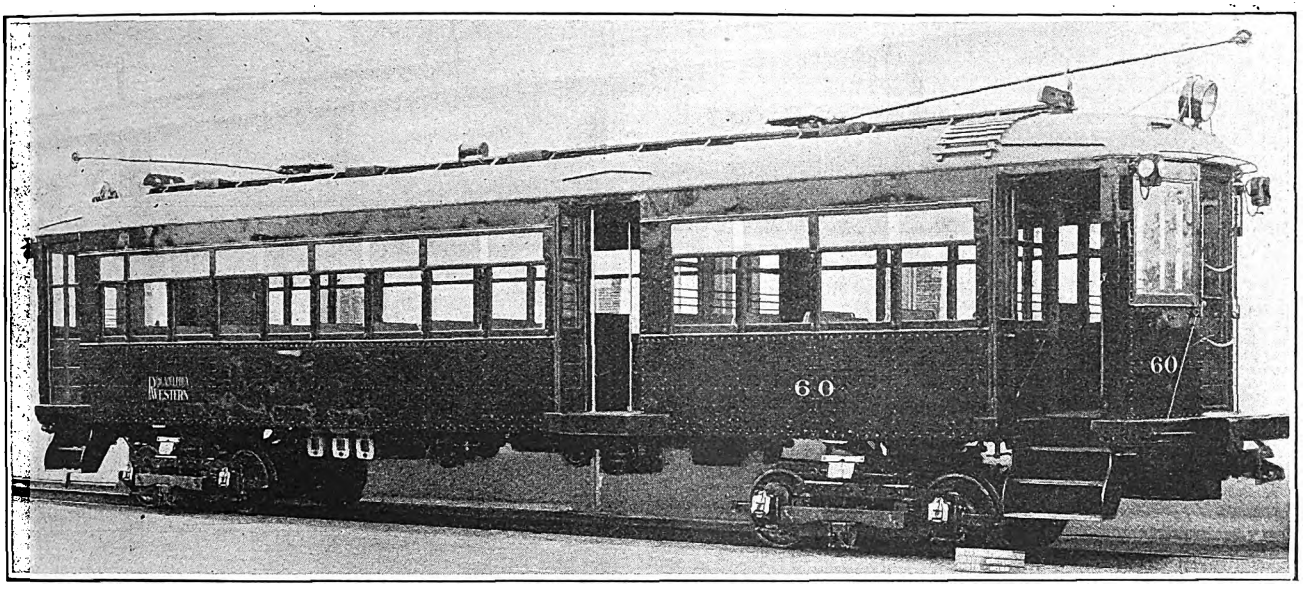


This Philadelphia & Western Car Is Divided Into Two Compartments. Center Doors Without Steps Are Provided

Light-Weight Interurban Car Has Cabinet Control

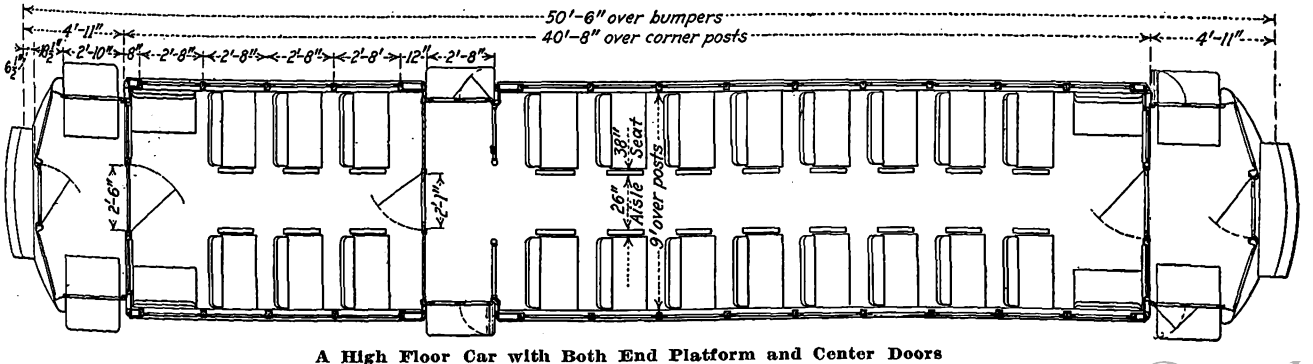
A Sample Car Being Tried Out on the Philadelphia & Western Weighs 57,000 Lb. and Seats 56 Passengers—Center Doors Without Steps Are Used at Flush Platforms—Automatic Control Equipment Is Designed to Operate in Trains with Other Control

A LIGHT-WEIGHT car with all-steel body has recently been placed in interurban service by the Philadelphia & Western Railway between Philadelphia and Norristown, Pa. The car is 50 ft. 6 in. over the bumpers and 40 ft. 8 in. over corner posts. The interior is divided into two compartments at a small vestibule with side doors for entrance and exit, in addition to the end doors. These side doors are used at stations provided with flush platforms, which are installed at most of the stations on the road. Cross seats 36 in. wide are used throughout except for four longitudinal two-passenger seats at the ends of the car. A width over posts of 9 ft. gives an aisle width of 26 in. The main passenger section seats 38 and the smoking compartment 18, making a total of 56. The seats are upholstered in cane. The car was built by the J. G. Brill Company, Philadelphia, and Brill light-weight trucks are used. The car is propelled by four Westinghouse 535-B 60-hp. field-control motors.

All doors are of the folding type, opening outward and operated by National Pneumatic door engines, controlled by individual air valves located adjacent to the door. The car is heated by Consolidated Car Heating Company cross-seat heaters with thermostatic control. The interior is lighted by a single row of lamps down the center of the car, with two lamps at the side doors, one on either side of the aisle. The center lamps are of 72-watt size, while the two door lamps are 36 watts. The lighting fixtures are Electric Service Supplies compensated type, with shades. Details of the equipment and construction of the cars are given in the table on page 134.

Cabinet Type Control Has New Features

The importance of having the control equipment readily accessible, dry, clean, warm and relatively safe at all times led to the choice of Westinghouse double-end, electro-pneumatic, cabinet-type equipment. All but



A High Floor Car with Both End Platform and Center Doors

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four pieces of the control equipment are mounted on a panelboard in a fireproof cabinet at the end of the car, with doors opening from the platform. These four parts, which are hung from the car underframe, are the fuse box, main grid resistor, controller resistor, and line switch. The parts of the equipment mounted on the panelboard include the electro-pneumatic unit switches, main and auxiliary knife switches, overload trip relay, reverser, motor cut-out switch and control cut-out switch. The panelboard equipment is mounted on a steel framework inclosed in an asbestos-lined metal cabinet, which extends from the floor to the canopy.

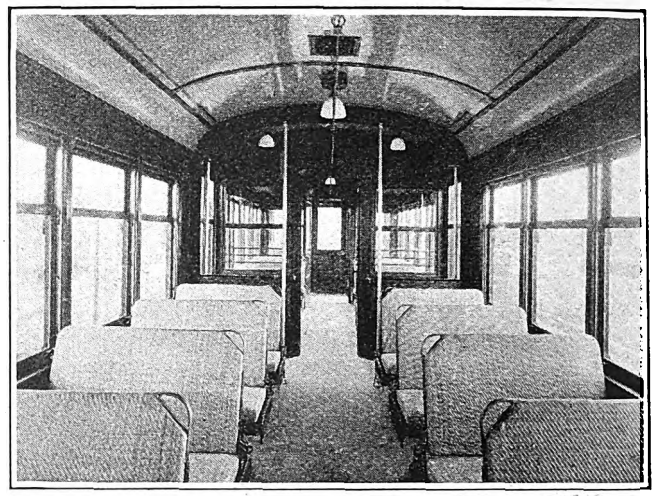
EQUIPMENT AND DIMENSIONS OF PHILADELPHIA & WESTERN INTERURBAN CAR

Number of cars ordered	One (sample)
Date of delivery	Oct. 27, 1924
Builder of car body	Brill
Type of car	Closed interurban passenger
Seating capacity	56
Total weight	57,000 lb.
Bolster centers, length	30 ft. 6 in.
Length over all	50 ft. 6 in.
Truck wheelbase	6 ft.
Width over all	9 ft. 1 in.
Height, rail to trolley base	14 ft. 6 in.
Body	All steel
Interior trim	Mahogany
Roof	Arch
Air brakes	Westinghouse
Axles	Standard, heat-treated
Car signal system	Faraday buzzer
Control	Westinghouse AL
Couplers	Tomlinson, Form 8
Curtain fixtures	Curtain Supply
Destination signs	Wood blocks, P. & W. Ry. Standard
Door-operating mechanism	National Pneumatic
Energy-saving device	Economy watt-hour meter
Gears and pinions	Nuttall
Hand brakes	National
Heater equipment	Consolidated
Headlights	Imperial
Journal bearings	Brass, 4½ x 8 in.
Lightning arresters	Westinghouse type M-F
Motors	Four Westinghouse 535-B, inside hung
Paint and enamel	Murphy
Registers	Ohmer
Seats	Brill Winner, cane
Slack adjuster	Westinghouse
Trolley base	Nuttall
Trucks	Brill
Ventilators	Brill
Wheels	Davis, 30 in.

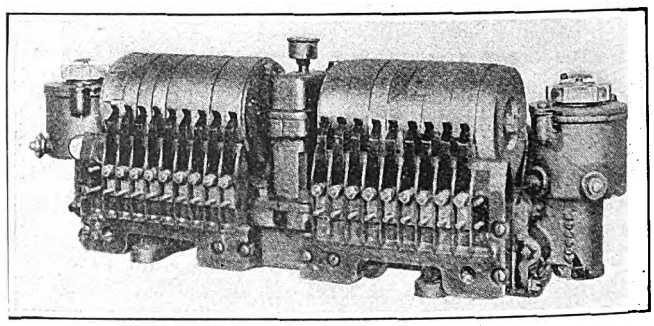
Additional control details required for automatic acceleration are separately mounted in a box on the bulkhead over the door, including the limit relay, sequence drum, and operating relays.

The circuit arrangement for the control embodies the usual Westinghouse type AL control scheme as illustrated in the accompanying diagram. The control is so arranged that this car can be operated in trains with cars equipped with two other types of control used by this company. The master controller has one switching and two running positions. The first position of the controller serves to bring in the LS, R1 and S switches, connecting the pairs of motors in series with the main resistor directly across the trolley. This position is used for coupling and slow operation of cars. The second position of the controller permits the sequence drum to advance to the full series position under control of the limit relay, while the fourth and last position allows the sequence drum to advance to full parallel with short field connection of the motors. The operator may choose at will the position of the master controller, and the sequence drum will advance to the corresponding position. Notch by notch acceleration may also be obtained by oscillating the master controller drum between the first and second positions or the third and fourth positions, each oscillation serving to advance the sequence drum one notch.

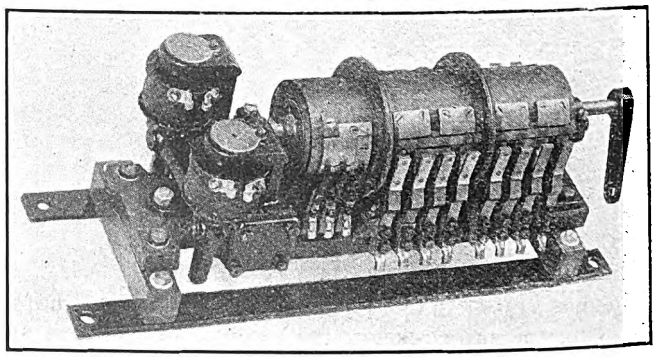
A protective feature has been added through the interlocking scheme in the circuit to the LS switch coil. Loss of power such as is caused by gaps in the third rail or the tripping of the overload trip relay causes the switches to open. Power cannot again be applied to the motors excepting by repeating the regular notching-up process. This circuit contains two interlock contacts. One contact is carried on the sequence drum and closes the circuit to the LS switch coil on the first position only. The second contact is carried on the moving element of the LS switch itself and shunts the first contact when the switch is closed. The contact on the drum closes the circuit to the coil and causes the switch to close, at which time the contact on the switch closes the shunt circuit, and continues to hold the switch closed while the drum advances to succeeding positions. In this manner the LS switch maintains its own operating coil circuit. Should the switch open for any reason, it cannot be closed again until the drum is in its original position. This feature eliminates motor flashing, prevents the tripping of heavily loaded and sensitive substation circuit breakers and maintains smooth, reliable and safe operation.



The Interior Is Divided to Provide a Smoking Compartment



The Sequence Drum Replaces the Older Type of Interlocks to Give Automatic Acceleration of the Motors



The Air-Operated Reverser Is Arranged for Emergency Hand Operation

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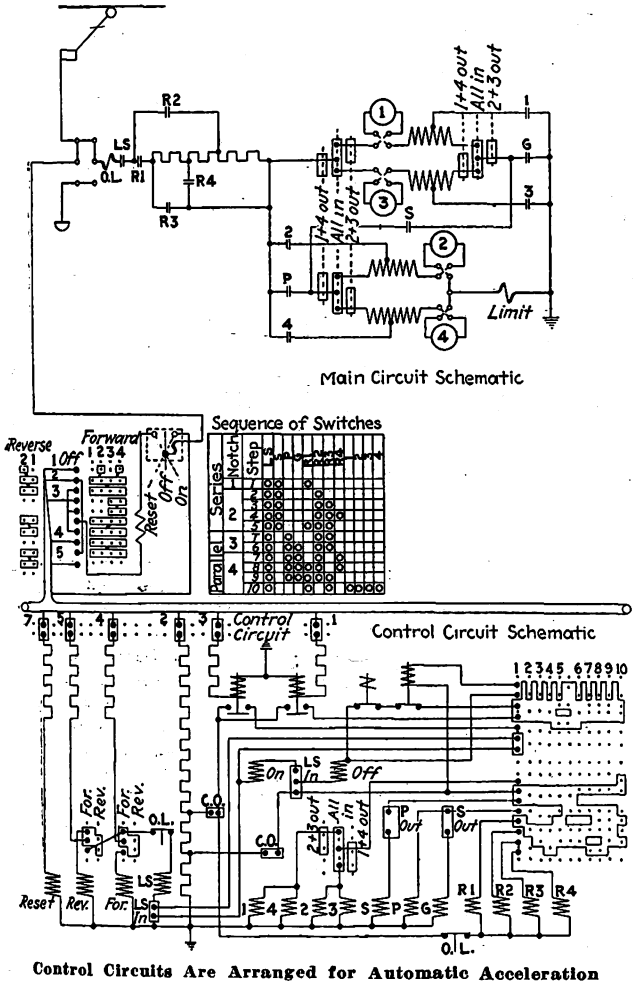
The main and auxiliary switches are mounted on a common base centrally in the cabinet. These switches are of the single-pole, double-throw, knife-blade type and are used to transfer the respective circuits to either third rail or overhead trolley. Above and to either side of these switches are mounted eight electro-pneumatic unit switches, while below are mounted the control cut-out, overload trip relay, reverser and motor cutout drum. The details are front connected, permitting ready access for inspection and maintenance.

The 10 switches are self-contained units with individual blow-out coils, being identical and interchangeable. Two of the switches are assembled in a sheet steel box



Control Circuits Are Arranged for Automatic Acceleration

and are hung from the car underframe. These two switches are used to take care of short circuits and overloads.

The lower contact of the switch is the moving element and is mounted by means of an insulator directly upon the piston rod. A heavy spring surrounds the piston rod and forces the piston down with a pressure of approximately 100 lb. The normal operating air pressure is 70 lb. per square inch, which gives a gross upward pressure of about 210 lb. so that a net pressure of about 100 lb. is obtained at the switch jaw. The stationary upper contact is shielded within an arc chute held between the pole pieces of the blow-out coils.

Protection from overloads and short circuits is provided by means of an overload trip relay, with a series coil in the main motor circuit. The coil actuates an armature which strikes and lifts a vertical shaft carrying the interlocks in the circuits of the unit switch magnet coils. This breaks the circuit and opens the switches. The relay is returned to normal or reset position by means of a reset coil which trips the armature from the locked position.

The reverser and the motor cutout switch are very similar. The reverser is normally electro-pneumatically operated but may be operated manually, whereas the cutout is manually operated only. Fingers carrying motor current are mounted upon an insulating base and rest upon copper contacts carried upon a drum which is moved by the magnet valve or handle, as the case may be. The circuit to the magnet coils of certain of the unit switches is brought to fingers and contacts on the reverser for interlocking to insure against moving the reverser while power is being applied to the motors. Similar interlocking is accomplished on the cutout to prevent closing the short field unit switches when the corresponding motors are inoperative.

Automatic acceleration of the motors is accomplished by means of a sequence drum, governed by a limit relay. The drum has a definite rate of rotation giving a constant rate of acceleration. It is operated by two opposed magnet valves and cylinders connected by a rack engaging with a pinion carried on the drum shaft. Energizing the "on" magnet opens the inlet valve to its cylinder; energizing the "off" magnet opens the exhaust part of its cylinder. De-energizing causes the reverse operation. Consequently energizing both magnets causes the drum to advance in one direction, whereas de-energizing both magnets causes the drum to rotate in a reverse direction. Energizing one and de-energizing the other stops progress of the drum in either direction.

The limit relay used to govern the rate of advance of the sequence drum comprises a series coil in the main motor circuit whose armature carries a contact in the circuit of the "off" magnet of the sequence drum. When the motor current exceeds a predetermined value, the armature is actuated, lifting the contact and breaking the circuit to the "off" magnet of the sequence drum and thereby arresting further advance of the drum until the motor current drops to the proper value.

The train line circuits carry trolley potential, whereas the control apparatus operates at approximately one-fourth trolley voltage or less. To keep the high voltage out of the control apparatus, operating relays are provided. These are connected to the respective train-line circuits and when energized close the respective low-voltage control circuits. One relay controls the circuit that causes the sequence drum to progress to full series or full parallel, whereas the other relay causes the drum to advance through transition of motor circuit connections. The low-voltage control circuits are energized from the control resistor, which is of the heater type and is mounted under the car.

Altoona Trainmen Have Voluntary Relief Association

THE employees of the Altoona & Logan Valley Electric Railway, Altoona, Pa., have organized a voluntary relief association. The dues are $1 per month. Accident and sick benefits are paid at the rate of $1 per day. In case of the death of an employee his family receives $200. In case of the death of the wife of an employee, the latter receives $100. At the same time all employees are insured under the Metropolitan group insurance plan. The railway pays the premiums to the extent of $500 for each employee, who has the privilege of taking out $500 more on his own account.

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Continuous Transit Proposed for Atlanta

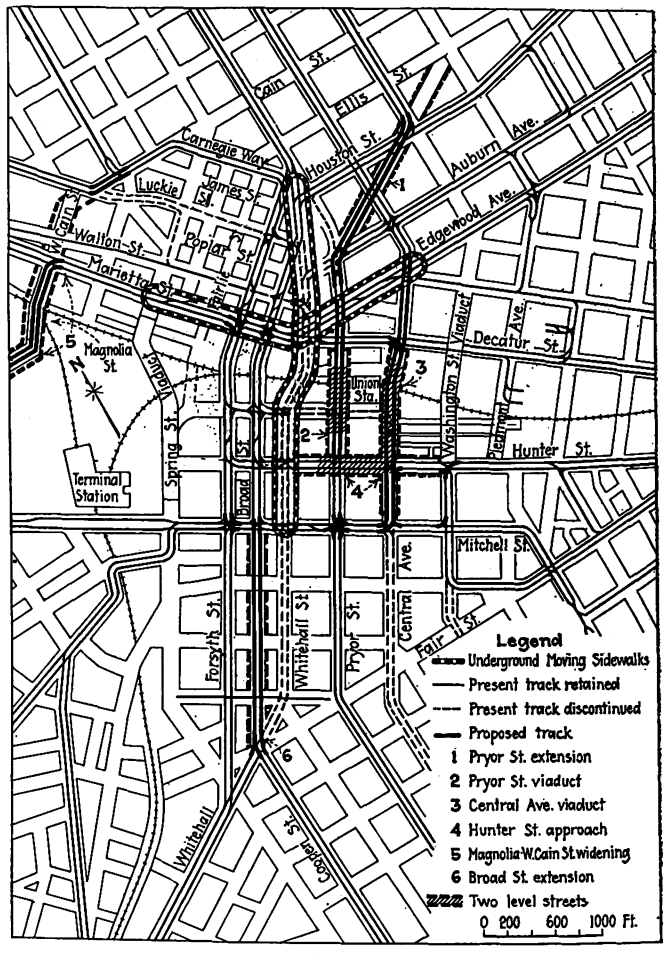
Underground Moving Sidewalks in the Business District Are Suggested in Beeler Report as the Most Economical Method of Relieving Sidewalk Congestion—New Viaducts and Double-Deck Streets Are Other Improvements Recommended

UNTIL recently Atlanta had no city plan. The wholesale, packing and manufacturing districts closely adjoin the shopping district, and the heavy teaming, trucking, light vehicular traffic and street cars mingle promiscuously to the detriment of all. The streets are narrow, comprising only 33 per cent of the business area. Many are not through streets, branching off from Peachtree, the main street, first on one side and then the other, herringbone fashion. This arrangement is responsible for a multiplicity of turning movements, resulting in traffic congestion and consequent delay.

To remedy some of the deficiencies a city plan was adopted in 1922. A traffic plan following this scheme, but containing certain additional features made desirable by more recent developments, has been prepared by the Beeler Organization, New York, and presented to the city. A number of features of this report were described in ELECTRIC RAILWAY JOURNAL for Jan. 10. Others are outlined below.

Concentration of traffic in the small area of the central business district has resulted in the slowing down of all vehicular and street car movements. During the evening rush hour automobiles, taxicabs, buses and jitneys choke the main thoroughfares. The cars are slowed down to little better than a walk and pedestrians jostle each other to the limit of the sidewalks and crowd the street intersections. The pedestrian far outranks all the rest both in numbers and importance, according to the Beeler report. A check showed that 14,658 pedestrians passed Five Points, the intersection of Marietta, Decatur, Peachtree Streets and Edgewood Avenue, during the rush hour and there were only 8,785 riders in vehicles of all sorts.

New and enlarged transportation lanes for the vehicles and additional transit facilities for the pedestrians are needed. By rerouting the cars, widening streets, cutting new streets, building viaducts and an underground moving sidewalk, traffic will be diffused and equalized throughout the congested area. A revised plan for the business district as recommended in the report is shown in an accompanying illustration. The seven principal north and south streets will then cross overhead the steam railroad tracks which bisect the business district. Three arteries will be given over solely to vehicular traffic and four others will care for the street railway and general traffic. Double-decked streets are also recommended.



Proposals of the Beeler Report to Relieve Traffic Congestion in the Business District of Atlanta, Including Street Openings and Viaducts, Two Sub-Surface Moving Sidewalks and New Car Tracks

UNDERGROUND MOVING SIDEWALK PROPOSED

It is proposed that a system of continuous subsurface transit be installed. Two sections are recommended, one on Peachtree-Whitehall Streets from Mitchell to Carnegie Way, a distance of 2,960 ft.; the other on Marietta-Edgewood Streets between Spring and Ivy, a distance of 2,300 ft. The total length of the system would be 5,260 ft.

This method of handling local transportation is favored in the report because of the density of pedestrian traffic. It would consist of three parallel continuous platforms directly beneath the surface sidewalk, operating endless chain fashion, up one side of the street and down the other, looping back at the terminals. The speeds proposed for the first, second and third platforms are 2, 4 and 6 m.p.h., respectively. A stationary walk 30 in. wide inside the low speed platform would permit access at any place along the line.

According to the plan the first and second platforms would each be 27 in. wide. The outside platform would be 57 in. wide and would be provided with seats spaced 32 in. from center to center, each accommodating two passengers. The total width of the three platforms assembled would be 9 ft. 3 in. and the height of the platform above the rail would be less than 12 in. The second and third platforms would overlap the adjoining platforms about 1 in.

Each walk would be made up of a series of small trucks about 8 ft. long with radial ends fitting exactly into each other. Each truck would have at one end two independent wheels on ball bearings and at the other end rest on the preceding truck through a universal coupling. Compressed sheet metal covered with anti-slip mastic would be used for the floors.

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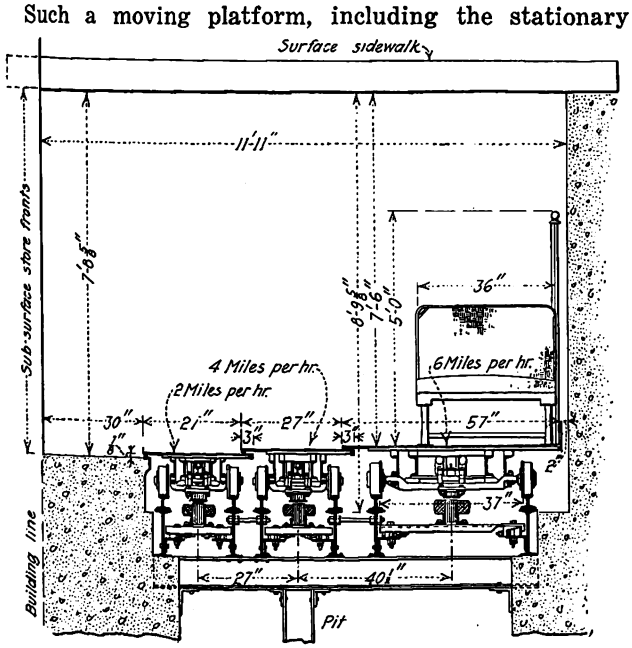
Either of two methods of propulsion may be employed, induction drive or racks and pinions. In the first instance, a secondary element similar to the short-circuited winding of an induction motor, made in straight sections 8 ft. long, would be placed on the under side of the trucks forming the platforms. The stationary or primary elements of the motor would be in sections 5 ft. long and placed between the rails in groups about 140 ft. apart with an air gap of $\frac{3}{16}$ in. between the primary and secondary. Both elements would be adjustable so as to preserve the air gap. Three-phase alternating current with a frequency of 37.5 cycles per second would be used to drive the high-speed platform. The 2-mile and 4-mile platforms would be driven in this manner with the identical construction, but with the frequency reduced to 12.5 and 25 cycles, respectively. (This system was described in ELECTRIC RAILWAY JOURNAL for Nov. 24, 1923, page 899.—ED.)

With the rack-and-pinion method, the racks would be continuous and mounted on the under sides of the platforms in the same manner as the secondary element in the induction drive. The driving units would be placed at intervals of from 1,000 to 1,500 ft. The induction drive method is thought to be the more simple, satisfactory and efficient.

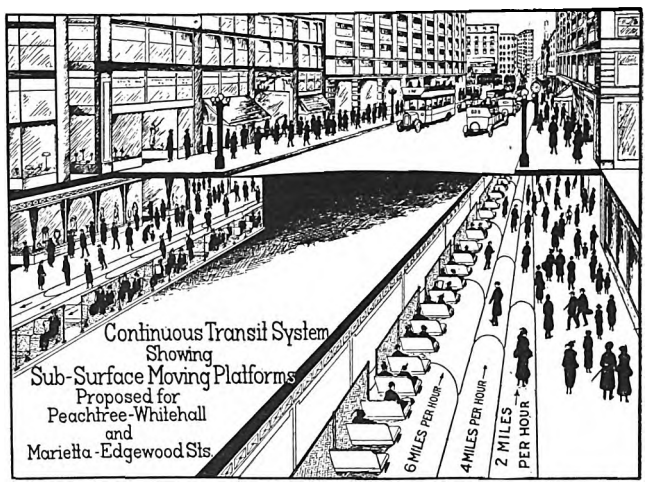
In operation, the passenger boarding the moving platform would step from the stationary walk or station to the first platform, which would travel at 2 m.p.h.; then to the second, traveling at 4 m.p.h., and finally to the third, traveling at 6 m.p.h. Here he would take a seat and be transported nearly twice as fast as he could walk. In alighting, the reverse order of stepping from one platform to the next would be followed.

In the event that a higher rate of speed is later found advisable this could be increased to 2.5, 5 and 7.5 m.p.h., or even 3, 6 and 9 m.p.h. Considering the comparatively short distances involved in the Atlanta plan, speeds of 2, 4 and 6 m.p.h. are thought to be satisfactory. Every fourth unit, comprising three double seats, might be especially designated for the use of the colored population. These seats might be enameled a brilliant blue, while the other seats are buff or orange, so that the two classes could be distinguished readily.

Such a moving platform, including the stationary walk, requires a clear space 12 ft. wide and 9 ft. high, including the rails. Entrance stairways would be constructed on both sides of every street intersection and basement entrances from important stores and buildings at intermediate points. With the stationary walk, a continuous station would be provided the entire length of the line, permitting the stores to improve their basements and make a continuous arcade. The general arrangement proposed and a cross-section are shown in accompanying drawings.



Cross-Section of the Moving Sidewalk Recommended as a Means of Relieving Sidewalk Congestion



The Appearance of the Proposed Continuous Transit System

In case of an interruption in the service from any cause, the speed of the platforms can be controlled automatically. Should a platform be disabled from any cause it can be stopped and the other platforms continued in operation at a reduced speed. In the event that all movement is stopped, there will always be a continuous open walk 9 ft. wide, well lighted, well ventilated and with exits to the street above every 200 to 300 ft.

The installation requires an excavation but slightly in excess of 250 sq.ft. in cross-section, as compared with 1,000 sq.ft. in four-track subway construction, and the cost will be proportionately less, as the interference with sub-surface structures is minimized.

The total weight of the rolling stock equipment per seated passenger is 350 lb. as compared with 1,500 lb. in subway operation, and the total tractive resistance per ton is less than one-half of that in the latter operation. The seated capacity at the 2, 4 and 6 m.p.h. rate would be 23,600 passengers per hour each way, the report states.

The first cost of equipment complete, including tunnels, is estimated to be about one-fifth of the cost of a four-track subway equipped, and the operating cost is about one-sixth as much for equivalent service.

Advantages claimed for this system of continuous transit are that it will afford relief to the present street traffic congestion, will more than double the present sidewalk area of the streets affected, will transport pedestrians 100 per cent faster, without exertion, and will distribute passengers from the various transportation arteries to practically all parts of the business district. It will afford the merchants and stores along its route double display space with show windows on both the street above and the moving walk below.

MOVING WALK WOULD AVOID PARKING

Parking of cars can be virtually eliminated from the streets of the entire central district. In fact, it will be unnecessary to enter the more congested parts of the business district with the automobile, the report says,

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because the owners may park their cars outside of the business district, step to the nearest entrance of the moving platform and be quickly transported to within easy reach of any part of the central district. Garages of huge proportions could be located near the platform terminals on the north, south, east and west sides, where cars can be parked and otherwise cared for at a nominal expense. It is recommended that this system be built by the municipality and the service furnished free to the public. The estimated cost of the installation is $3,000,000.

Development of Close-In Territory

Many beautiful suburbs have been developed in the territory contiguous to Atlanta. In fact, the growth has been faster outside of the city than within. This development is a large factor in Atlanta's prosperity, but, being scattered, is rather costly to the community as a whole. With communities moving out from the business center the expense of supplying them with modern conveniences increases. Longer electric light and telephone lines, more gas mains and more street car tracks are needed with a scattered than with a compact community. This is reflected in the increased operating expenses, which must be paid for by the public with the service charges. The effect of this can be seen from the average distance the railway carries its pay passengers, 3.40 miles, which is unusually long for a city of this size.

According to the report, however, there is close-in territory practically undeveloped. Some would require extensive grading, while other sections could be developed at very little expense. It is urged that the city institute a campaign for the development of close-in territory. This development can be encouraged by the improvements recommended.

To remedy present conditions and properly care for future expansion, a number of important civic improvements, including street openings, viaducts and other improvements, are necessary. The steam railroads between Decatur and Hunter Streets bisect the business district, as shown on the accompanying map. Of the seven principal thoroughfares connecting the two parts, the two outer ones, Spring and Washington Streets, are carried over the railroads on viaducts. Forsyth, Broad and Peachtree Streets cross overhead on bridges, while Pryor Street and Central Avenue cross the tracks at the surface. During the rush hours the Peachtree, Broad and Forsyth Streets bridges are so badly congested that the overflow is forced to use the grade crossings. More than 500 vehicles per hour cross these busy tracks at either end of the Union Station during the period of maximum traffic.

Two viaducts are recommended, as follows: On Pryor Street, commencing at Decatur Street and extending to Hunter Street, and on Central Avenue, commencing at Decatur Street and extending to Mitchell Street. By extending the latter to Mitchell Street, ample headroom will be provided for all the roadways of the Atlanta joint freight terminal. The heavy hauling to and from these terminals and the produce house district on Alabama Street will be conducted on the street level, where it will not interfere with the faster movements of the lighter traffic overhead.

Street Openings and Widenings

One of the most detrimental features of the layout of the business district is that the principal thoroughfares end blindly or converge. At the present time the city has arranged for, or is considering, several needed street improvements, notably the widening of Peters Street and the opening of Madison Street into Whitehall. A number of other projects, however, are recommended in the report. Broad Street should be opened from Mitchell through to Cooper and Whitehall and Pryor Street should be extended from the intersection of Auburn, swinging to the east, and giving a connection with Ivy Street, Courtland Street and Piedmont Avenue. Magnolia and Cain Streets should be widened between Davis and Luckie Streets.

The cost of street opening and widening projects considered in the report is estimated at about $2,500,000. Construction of viaducts will necessitate an additional expenditure of approximately $2,000,000. The expense of street widening and opening should be divided into two equal parts, the report recommends, one part to be assessed against the property benefited and the other to be paid for by the city at large. The cost of building viaducts should be divided into four parts, the steam railroads, the street railway, the property benefited and the city at large paying equally.

The recommended street openings and new viaducts will enable the Georgia Railway & Power Company greatly to improve the car routes in the downtown district. Among the important changes of this kind recommended in the report are the discontinuance of track on Peachtree and Whitehall Streets between Cooper Street and Luckie Street and the construction of new track on the extension of Broad Street between Mitchell Street and Whitehall Street. Details of the proposed changes in car routes will be given in an article which will appear in a future issue of this paper.

More Evidence of the Merchandising Value of New Equipment

WITH the close of 1924, the Indianapolis & Cincinnati Traction Company completed 6 months operation with its new rolling stock, the system having been changed from a.c. to d.c. operation and the new cars placed in service on July 1. In the month of June just prior to the change, this company showed a 15 per cent loss in number of passengers as compared with June, 1923. Similarly, for that month and for the 6 months to the end of the year, the other interurban companies using the Indianapolis terminal, exclusive of the Interstate Public Service Company, which also operates new cars, have had a traffic running from 15 to 21 per cent less than for the corresponding months of 1923. But the new cars on the Indianapolis & Cincinnati lines attracted patrons to the extent that for July, August, October, November and December the number of passengers was just about even with, slightly above or below, the number for the corresponding months of 1923, and for September was 6 per cent above.

An interesting sidelight on the number of passengers in September was that during the State Fair held in this month the I. & C. offered a round-trip ride for 80 per cent of the one-way fare and took in more money than the year before with the old equipment and a round-trip fare of 1½ times the one-way fare.

As a further effort to advertise the new equipment, a $1 round-trip fare to and from any point on the line has been in effect for 24 Sundays. Without exception the revenue taken in on each Sunday has been more than was taken in on the corresponding day for the year before.

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Trolley Arrangement on Bascule Bridge

Bar Construction Is Replaced with Trolley Wire on Lift Bridge of the Galveston-Houston Electric Railway—Hinged Connections and Flexible Suspension Among Improvements

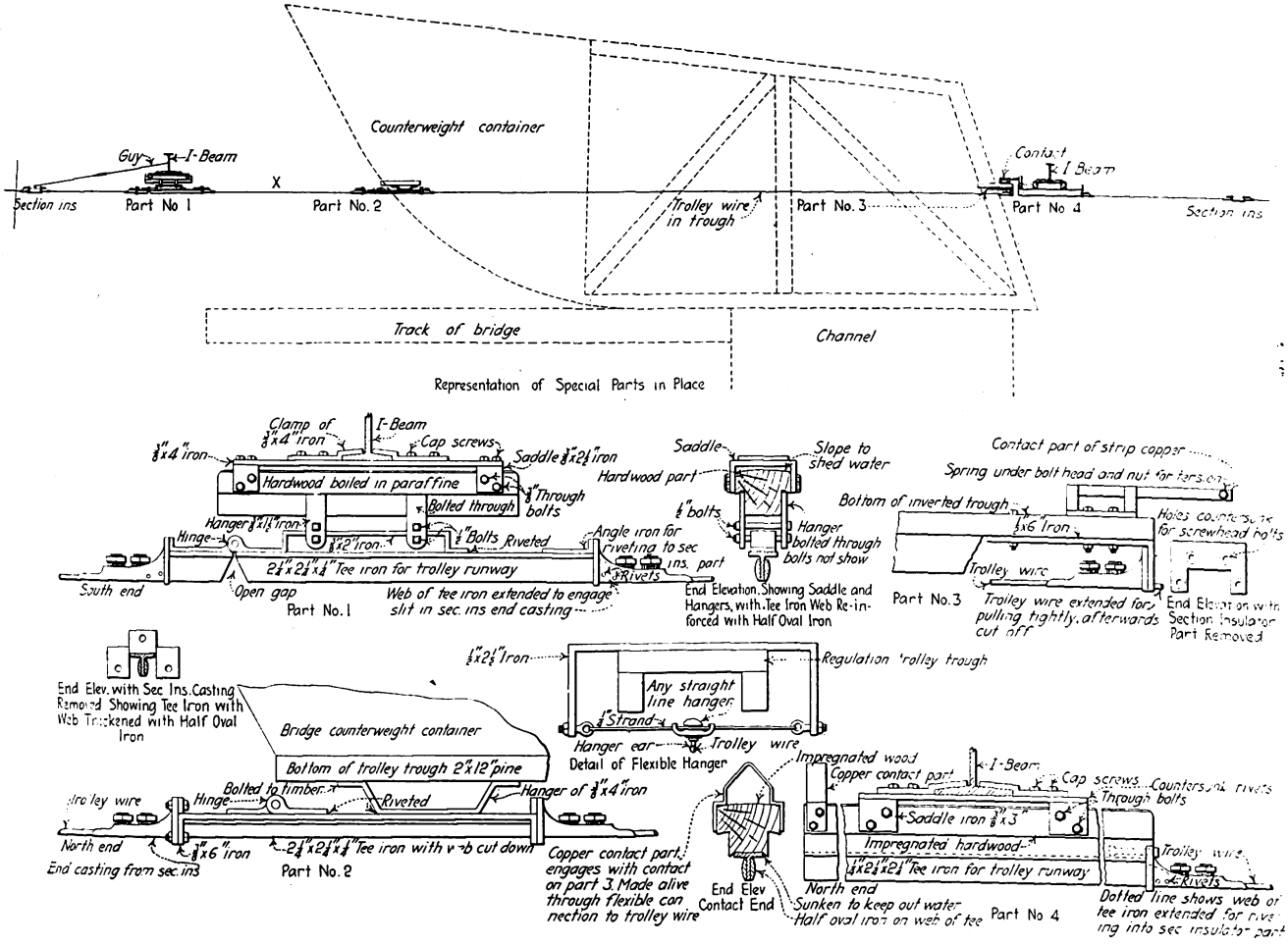
BY C. L. GREER
Galveston-Houston Electric Railway, Houston, Tex.

THE problem of providing a satisfactory trolley wire arrangement on a bascule bridge of the Galveston-Houston Electric Railway has been a perplexing one for 12 years. A satisfactory arrangement has now been obtained, and is shown in the accompanying illustration.

Before the present construction was adopted, the trolley runway over this bridge consisted of two steel angles placed together so as to form a "T," and fastened to the under side of a trolley trough. The section which slacks back as the bridge is lifted was formed of a flexible wire rope, which had a system of weights and pulleys to take up the slack as the bridge raised. This arrangement was unsatisfactory, as the wire rope wore out rapidly and serious difficulty was experienced from the trolley wheels leaving the runway.

The construction illustrated has now been substituted. Considering the parts as they appear from left to right in the accompanying illustration, the first is a section insulator, which separates the trolley runway on the bridge from the line to the left, so that the section of trolley on the bridge is fed from the right end. This section insulator is connected to Part 1 by standard No. 0000 grooved trolley wire. The end castings of Part 1 are made from standard section insulators. The center part is made to form a hinge and is supported from one of the I-beams of the bridge by a saddle fastened to a hardwood insulator. The top of this wooden section is sloped so as to shed water readily, and the lower part is formed to take two hangers from which a $\frac{3}{8}$-in. x 2-in. iron is supported. This in turn supports a $2\frac{1}{4}$-in. x $2\frac{1}{4}$-in. x $\frac{1}{4}$-in. T-iron, used as the trolley runway. The sides of this iron are reinforced with $\frac{1}{2}$-in. oval iron. The part between 1 and 2 slacks back as the bridge is lifted, and in the latest construction consists of No. 0000 grooved trolley wire, the same as the remainder of the line. In the first construction used, $\frac{3}{8}$-in. galvanized messenger wire was tried. As it is sometimes necessary for cars to stop and start on the bridge, heavy currents are drawn, and the galvanized wire proved unsatisfactory. The hinged arrangement of Part 1 allows this section of the trolley to drop as the bridge is lifted.

At the left-hand end of the bridge counterweight container another hinge construction is used. This is shown as Part 2 and is quite similar to that of Part 1. The end castings used are from standard section insulators. Parts 3 and 4 are arranged to break the contact as the bridge lifts. No. 3 supports the end of the trolley wire and has a contact piece of strip copper at the top. Part 4 has contact jaws to form the other part of the switch, which breaks as the bridge opens. The section insulator shown at the right has a jumper around it, with a disconnecting switch. The bridge trolley wire is fed through this jumper.



Construction Used for Trolley Wire on Bascule Bridge of the Galveston-Houston Electric Railway

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Slacking back of the line trolley is prevented by guys which run from the section insulator at the left-hand end of the bridge to the I-beam, to which Part 1 is clamped. When the bridge is down, the guys are slightly slack, and the section between Parts 1 and 2 takes the full trolley strain, but as the bridge rises, the guys are pulled taut so as to take the entire trolley strain.

The section insulator at the left end also has a jumper with a switch, which is normally kept open and is used only in case it is necessary to energize the trolley wire on the bridge from the left end.

A detailed sketch is also given of the special hanger for the trolley wire used along the trough. This type of hanger is very flexible and much better than the stiff barn hanger commonly used in such locations. It also eliminates the hammer blow which usually takes place with this type of construction.

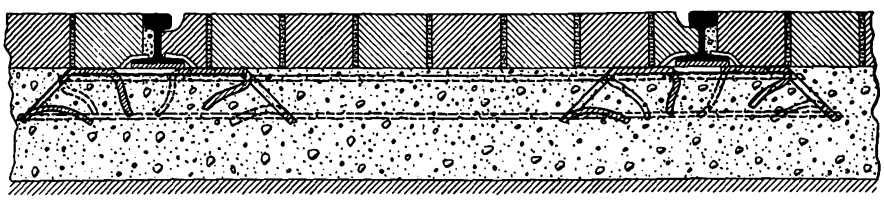
Cushion Tires Tried at Cleveland

Experiments Are Being Made with a Track Structure Which Provides Unusually Wide Support for the Rails—An Asbestos-Asphalt Cushion Is Expected to Have an Important Effect in the Elimination of Noise

A NEW type of substitute tie designed by Charles H. Clark, engineer maintenance of way Cleveland Railway, and Chester F. Gailor, consulting engineer, is being tried in Cleveland. This differs from the ordinary type in that it has a greater width of support for the rail. Contrary to usual practice the rail supports are not continuous from one rail to the other, but are provided for each rail individually and connected only by tie rods.

Each of the supports is made from flat sheet steel formed into a trapezoidal channel or chamber open at the bottom. At suitable points tongues of metal are punched out and bent inward to project into the chamber. Other portions in the form of lugs or clips are punched out and bent outward or upward extending lengthwise of the track and being arranged to project over the two edges of the rail base. There are four of these to each support.

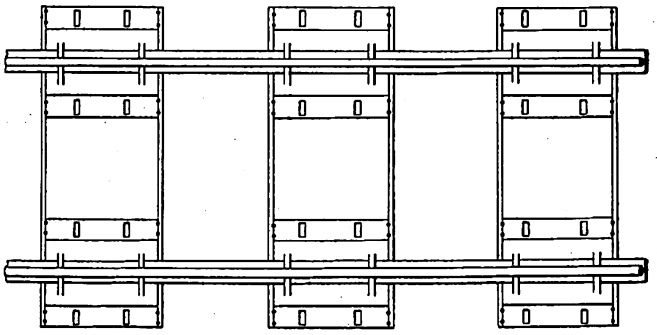
The chamber is then filled with concrete, which is done in the yard of the track department or at any other suitable place before the supports are taken to the job. The pouring is done while the support is in an inverted position held by a suitable frame. This frame has end walls to close the open ends of the chamber and thus hold the concrete. The tongues or inward projections form steel reinforcing members. It is thought that pouring the concrete with the side walls of the chamber converging downward will insure that the mass of concrete will be homogeneous and that a good connection between the concrete and the metal will be obtained.



Type of Track Construction Being Tried in Cleveland with Asbestos-Asphalt Cushions Under the Rails

Rail holding clips take the place of spikes or similar rail fastenings. To fasten the rails after they have been placed on these metal supports the clips are hammered down until they are in firm contact with the rail base. As this sometimes proves difficult in practice, small wedges are driven between the upper surface of the rail base and the lower surface of the clips. These are then welded to the rail.

The rail base rests on an interposed flat strip of asbestos-asphalt or other suitable material, which forms a cushion of the same width as the rail base and as long as the top member. In this way a damping effect is obtained which it is thought will eliminate most of the noise now common to street railway track structures in paved streets.



The Unusual Spread of the Rail Supports Gives This Track Greater Stability than Is the Case with Ordinary Ties

In order to maintain the proper gage, tie rods have been welded at top and bottom of the supports. These rods are then imbedded in the concrete base in which the rail supports are placed, thus forming a continuous solid mass. This also acts as reinforcement for the concrete. The upper surface of the base concrete is made flush with or slightly above the upper surfaces of the steel supports.

A cross section of the track structure is shown in an accompanying illustration. The paving blocks are grouted at the joints and the heads and webs of the rail are likewise imbedded in grout. In this way a monolithic structure is obtained. Notwithstanding the rigidity of the mass, the track is said to be practically noiseless on account of the cushions under the rail. This design provides considerably greater support for the rails than is now ordinarily furnished, the ties covering about half of the linear dimension, while the central portion of the tie, which is of no great value in monolithic construction, is eliminated.

The work of placing supports of this type can be done with the simplest track tools. The supports are comparatively light and therefore easily handled, the expense of handling and shipping them being correspondingly low. As the support is made in one piece with the rail fastening it is impossible for the parts to work loose or become unserviceable on account of rusting of the threads as sometimes happens when screws and nuts are used. It is claimed that owing to the greater area of support it is possible to use a lighter rail section without impairing the stability or the lasting qualities of the track and roadbed. Should it be desired to do so, this type of rail support can be made continuous from one rail to the other, instead of being made in two pieces connected by tie rods.

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Oldest London Tube Reopened

After Extensive Changes Taking Two Years, Including Enlargement of the Tunnel and Modernization of the Stations and Rolling Stock, the City Railway Has Inaugurated Through Service with Other London Underground Lines

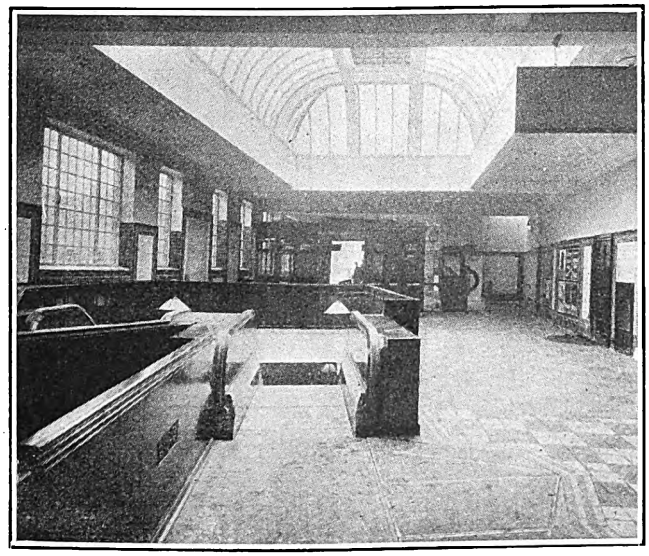
Exterior of the Stockwell Station on the City & South London Railway. This Is One of the Reconstructed Stations

THE City & South London Railway of London, England, which has been closed in parts for about 2 years during the work of enlarging its tubular tunnels, was reopened for traffic on Dec. 1, 1924, throughout its entire length of more than 7 miles. At the same time joint services were established with the Charing Cross & Hampstead Railway via the new junction between the two lines at Chalk Farm, through trains being run from the City & South London line to Highgate on one branch and to Hampstead and Edgware on the other.

The original section of the City & South London Railway, some 3 miles long, from King William Street in the City of London to Stockwell in South London, was the first underground electric railway in the world. It was opened for public service in December, 1890. Various extensions were made from time to time, both to the south and to the north, until the railway extended from Clapham to Euston, giving interchange stations with the main-line termini from the north. A further extension, some 5 miles long, from Clapham to Morden in Surrey, is now under construction.

Down to the time of the reconstruction now completed the tunnels were of only from 10 ft. to 10 ft. 6 in. diameter, with an 11-ft. 6-in. bore for a short distance. The cars accordingly were far from roomy, and they were hauled by small electric locomotives. Power was furnished by 500-volt, direct-current dynamos, and a third rail conductor was used. As the railway was extended, the three-wire system, and ultimately a five-wire system giving a pressure of 2,000 volts between the outers, was adopted for transmission to the most distant parts of the line. This involved the use of substations for stepping down the pressure.

In 1912 the railway was brought into the combine formed by the Underground Electric Railways Company of London, Ltd. This led to the abolition of the independent City & South London Railway power station at Stockwell, as thenceforward substations of the City & South London Railway were fed by the 11,000-volt, three-phase current from the larger power station built by the Underground company at Chelsea to supply all the associated electric railways in the group.



Booking Hall and Escalator Exit on Street Level at Stockwell Station

The management of the various railways then entered on a scheme for extending them in various directions and for linking them together. No through

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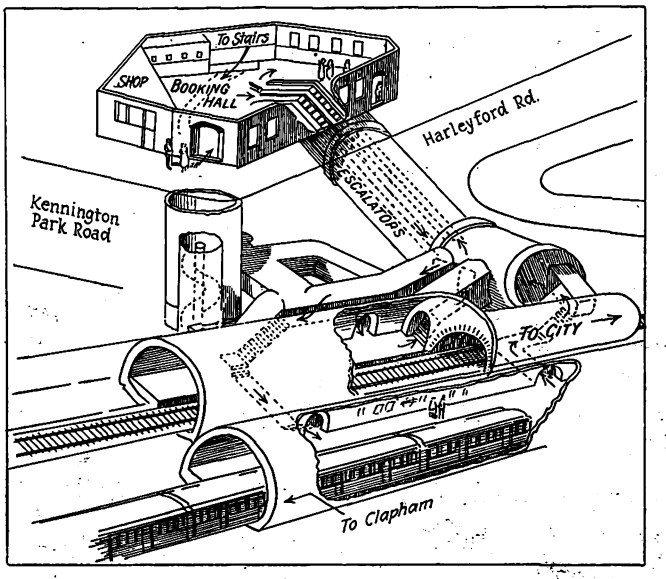
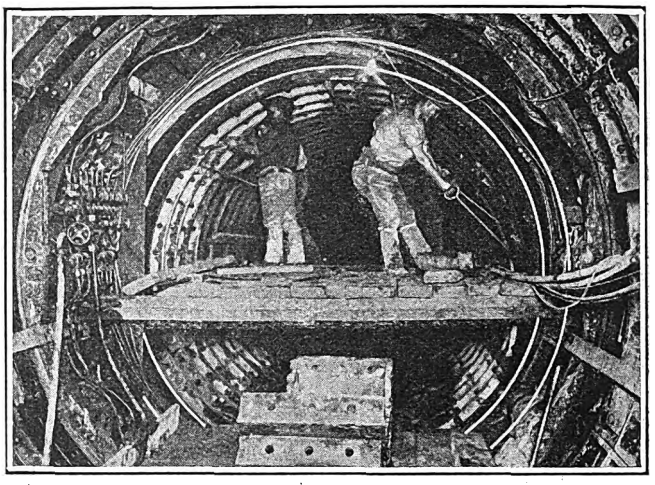


The Reconstructed Stockwell Station, Showing the Lifts Replaced with Escalators



The Tunnel During the Work of Enlargement. The Cast-Iron Segments Were Removed and the Tunneling Carried Out with the Greathead Shield System

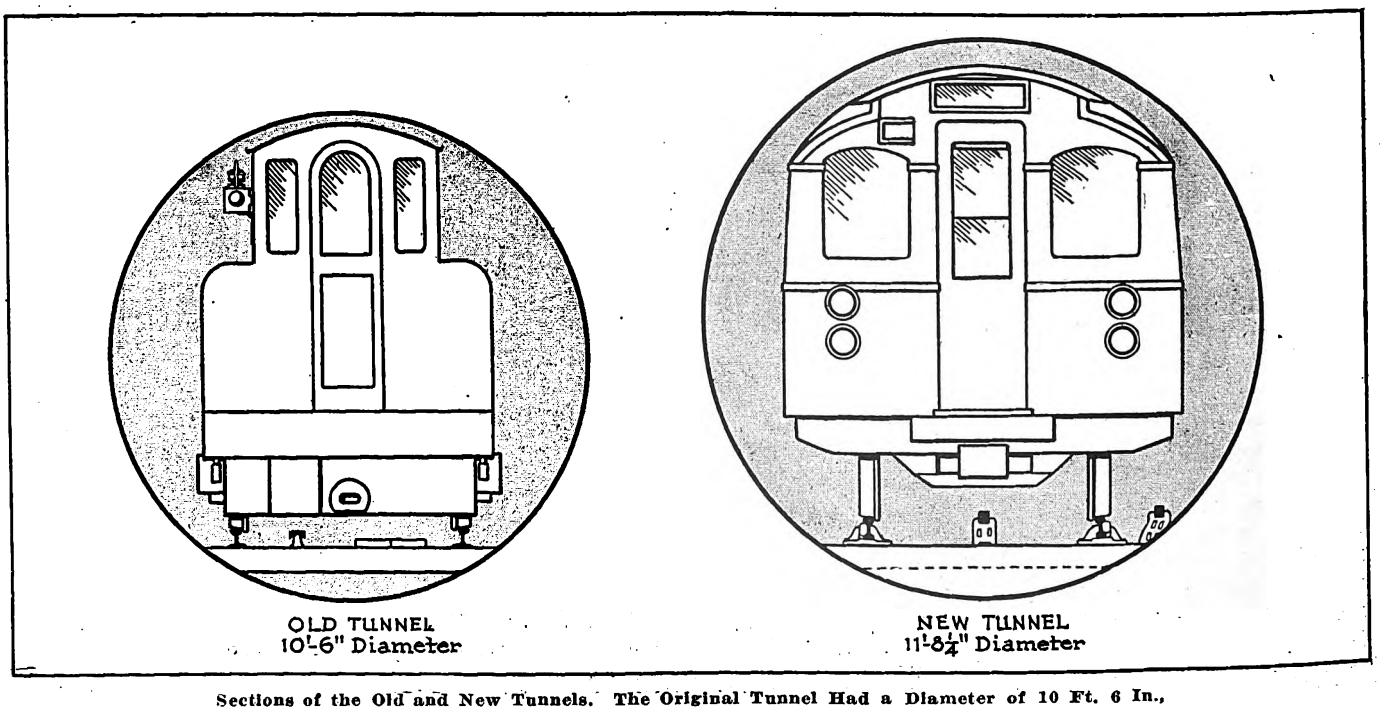
running, however, could be carried out in the case of the City & South London, as its tunnels were too small to admit of the standard size rolling stock used on the other tube railways. It was decided to enlarge the diameter of the City & South London tunnels to the size of 11 ft. 8¼ in. standard on the London Underground lines, and to make a junction with the Charing Cross & Hampstead Railway at Chalk Farm. This is the work which, after 2 years of construction, has now been completed. The electric locomotives have been abolished, the small old cars done away with, and new multiple-unit rolling stock similar to that on the other tube railways, which was described in this paper (issue of Sept. 20, 1924) substituted. The whole construction and equipment, including the passenger stations, have been modernized.

To enlarge the tunnels, the whole of the cast-iron lining segments were removed ring by ring, and as the tunnel was reamed out by the Greathead boring shield the lining was built up again, partly with new segments. On curves the tunnels have been enlarged to from 12 ft. to 15 ft. in diameter. The curves have been smoothed out and the general running conditions improved. The work was one of great difficulty, as during part of the period of reconstruction train services were continued in the daytime. Owing to the infiltration of water, work on some sections had to be carried on under compressed air.

Improvements have been carried out on many of the passenger stations, some of which have now their booking halls under the street level. Escalators in many cases supersede lifts, and everything has been brightened up. New track and new conductor rails have been installed, the running rails consisting of London standard 85-lb. per yard bull-headed section, laid on chairs bolted to wood sleepers. The positive and negative conductor rails are of special high-conductivity steel. The latest system of automatic signaling has been installed.

Train schedules have been speeded up and fares reduced, while through season ticket arrangements have been made with connecting railways and buses.

It was stated by Lord Ashfield, chairman of the Lon-



Sections of the Old and New Tunnels. The Original Tunnel Had a Diameter of 10 Ft. 6 In., While the Reconstructed Tunnel Has a Diameter of 11 Ft. 3¼ In.

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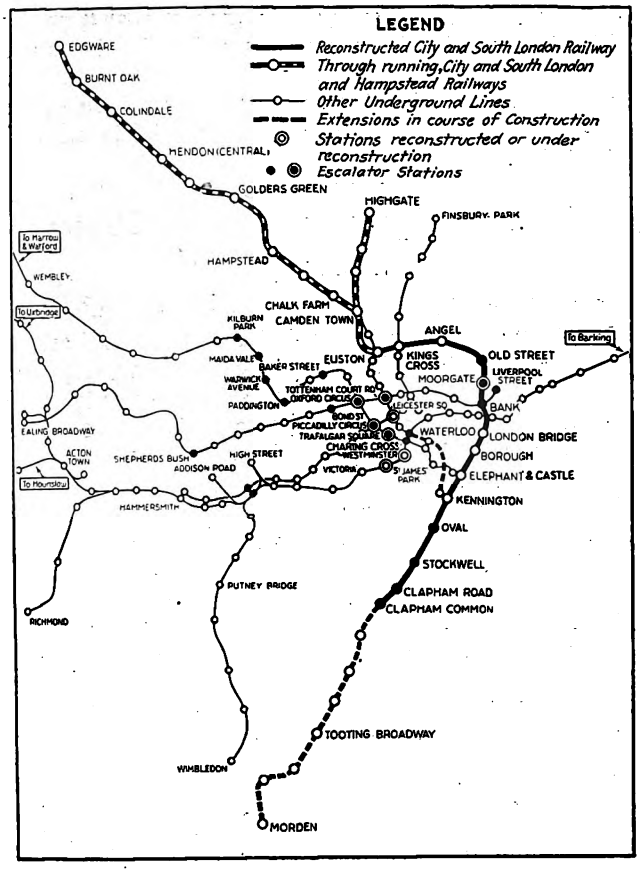


The City Railway Is Shown on the Map in Its Relation to the Other Portions of the London Underground System

don electric railway companies, at the opening ceremony on Dec. 1, that when extensions are completed the City & South London Railway will have the longest railway tunnel in the world, namely, 14 miles. He also mentioned that the various underground railway extensions with which his companies are associated will cost £16,000,000.

The spaciousness of the new cars and their easy and comparatively noiseless riding qualities were commented on at the opening run. It is proposed to call the reconstructed line "The City Railway."

On the opening day, beginning at 12:30 p.m., the passengers carried totaled 95,000, including 15,000 who were provided with free tickets. The bulk of these free tickets were not presented until after 7 p.m. Their holders were then accompanied by their wives and families, all riding the entire length of the line and back. No fewer than 500 passengers purchased season tickets at Clapham Common or took away forms for that purpose.

On the second morning the travel was unprecedented. Dense traffic presented itself at Clapham Common, Stockwell and Elephant Stations. At 5:30 a queue of more than 200 passengers lined up at Clapham Common booking office. Additional booking clerks were at once rushed to the station, but even then the queues showed no signs of abating. Ultimately, a number of ticket collectors provided with tickets from the booking office paraded along the queues and did a roaring business. This stream of passengers two and three deep was maintained until after 9:30 a.m.

Zone Check System Used on P.-O. One-Man Interurban Lines

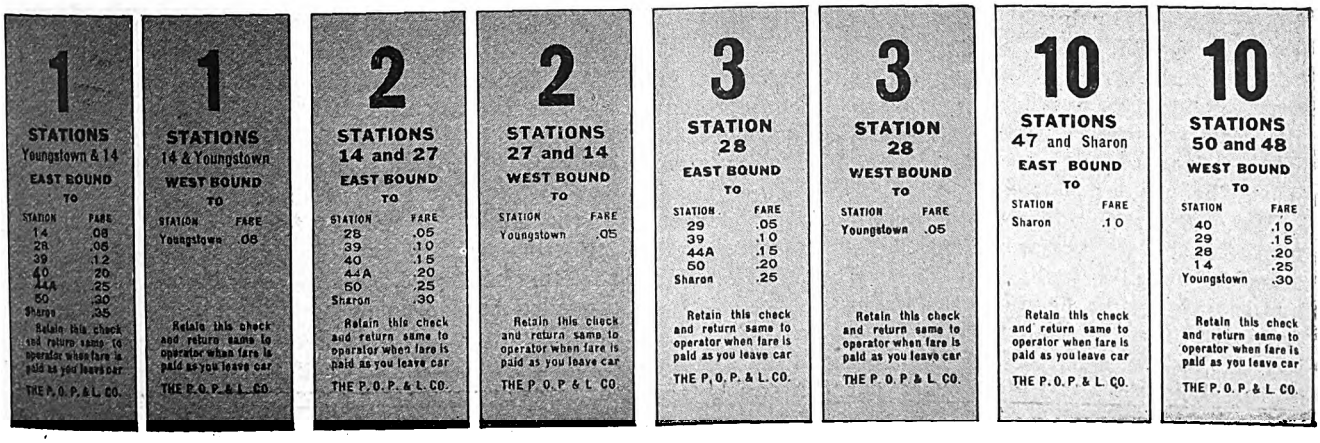
BY H. H. BEST
Traffic Engineer Pennsylvania-Ohio Electric Company

ONE of the biggest problems in one-man interurban operation is to provide a convenient, speedy, practical, inexpensive and workable system of fare collection. The tariff rates on the interurban lines of the Pennsylvania-Ohio system are arranged by zones. It was logical, therefore, to inaugurate a zone-check system for the identification of passengers. On the line between Youngstown, Ohio, and Sharon, Pa., there are 10 zones, the through fare being 35 cents. The interurban line between Youngstown, Ohio, and New Castle, Pa., consists of nine zones, the through fare being 45 cents.

Ohmer registers are used for "pay-as-you-leave" collection of fares. Each zone has a differently colored check. These are carried in a convenient container mounted on a pedestal at the rear of the register. The checks are of thin cardboard 1¼ in. x 3⅜ in. in size. Each check carries the number of the zone in which it was issued, the names of the stations in that zone and the exact rates to all other points on the line. One side of the check covers eastbound traffic and the opposite side covers westbound traffic.

A check is issued as the passenger boards the car except in the initial zone. Passengers who do not have checks as they leave the car are required to pay the maximum fare. The non-issuing of checks to passengers in the initial zone has the advantage that passengers who board elsewhere and who are entitled to them will be sure to get zone checks when they board and to return them to the operator when they leave.

Commutation tickets, school tickets, reduced-rate



These Zone Checks Tell the Passenger the Exact Fare to Any Point on the Line. One Side Is Used for Each Direction

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strip tickets, reduced-rate round-trip tickets, full-rate cash tickets, free transfers, paid transfers, trip passes, card passes and weekly passes all are used. The flexibility of the zone-check system permits the collection of fares in this multiplicity of ways. On the Youngstown-Sharon line through service is operated on a 30-minute headway. These through cars, on which the zone-check system is used, carry an average of 135,000 passengers a month or approximately 4,500 daily. The zone-check system has been in service for more than 6 months on the Sharon line. It has proved so successful that a similar system has been installed on the Youngstown-New Castle line and on the Youngstown-Warren line.

A desirable feature in connection with the use of these checks is an improvement in public relations which can be attributed directly to the system. The use of the checks has facilitated the loading of cars at all points on the line. It has eliminated the necessity of a passenger asking questions of the operator regarding the fare, as the check tells just what fare to pay and when to pay it. It has reduced to a minimum the necessity of the operator making change for passengers, as generally the passenger will present the exact change if he knows how much the fare is. From the standpoint of the company, the operators who handle the work, and the traveling public who use the service, the zone-check system has been a marked success.

Telephone Dispatching Saves Time of Work Cars

THE track maintenance department of the Boston Elevated Railway believes that its labor-saving machinery should be kept in service as much as possible. In order to accomplish this a telephone dispatching system for work cars and trucks has recently been adopted. Brief mention of this system was made in an article describing the use of track machinery in Boston published in ELECTRIC RAILWAY JOURNAL for March 17, 1923, page 458. Since that time, however, the system has been modified and extended.

Each foreman on a track construction job telephones the dispatcher's office about 3 o'clock in the afternoon and tells him the quantity of material which will be needed for that job the next day. The hour at which it is needed is also specified. If the quantity is small, delivery is made by motor truck. If the quantity is as much as, or more than, a carload, delivery is made by one of the company's work cars. After having heard from the various foremen, the dispatcher works out his program for using his cars and trucks the next day on work needed.

Trucks are ordinarily employed in the removal of waste incident to track reconstruction. This work can be done by motor truck without blocking the rail, whereas the use of an electric car might somewhat delay the regular passenger service.

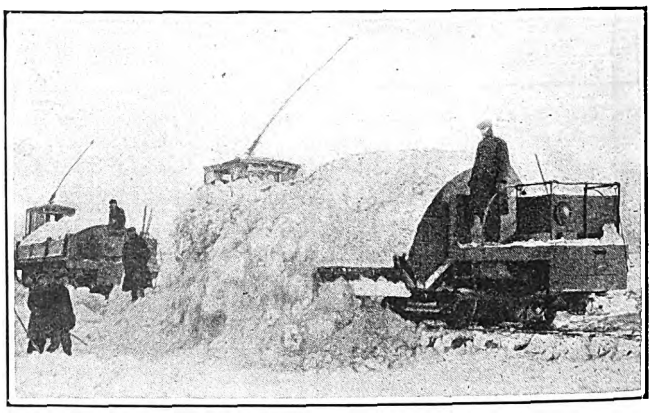
Men are borrowed from the transportation department to operate the work cars. Only as many are asked for as will actually be needed. When slow loading material is being handled, trainmen are transferred from one car to another, rather than allowed to remain idle during the time the car is being loaded. Details of this kind are carefully worked out the day before in the dispatcher's office.

No special forms are used by the work car dispatcher. He simply notes the material required by the foremen and the hour at which they require it when they telephone to him. He then prepares the schedule for as many cars and trucks as he expects to need the next day.

Railway Equipment Used to Remove Snow by City

THE people of Toronto, Canada, are quite accustomed to snowstorms, but one of unusual severity required special effort in order to relieve traffic conditions. The Toronto Transportation Commission, which operates the street railway, cleared its tracks of snow quickly and with little interference to service. But as other parts of the streets were not cleaned, the car tracks were used for all traffic, which caused considerable congestion and affected general business conditions. Prompt action by the city department was necessary, and so arrangements were made with the Toronto Transportation Commission for the use of its tracks and equipment in cleaning snow from the sides of the streets.

In order that the passenger car schedule should not be interfered with nor the street car tracks be blocked for vehicular traffic, the work was done between 12 o'clock midnight and 6 in the morning. Ten Differential dump cars, of the regular equipment of the maintenance-of-way department, supplemented by four flat cars, were used.



Dumping Snow at Manhole for Disposal After Removing It from the Streets of Toronto

The snow was loaded into these service cars from the street by hand and taken to the nearest available manhole and dumped in. Accurate cost was kept by the city and comparison was made of this method of removal with previous methods where trucks and teams were used. The cost of loading and disposing of the snow by means of the dump cars was 17 cents per cubic yard, including rental of the car, based on the regular rental price established by the Toronto Transportation Commission; all labor in loading, and the labor in shoveling that part of the snow which did not fall into the manhole as the cars were dumped. The Differential dump cars are 40 ft. 6 in. long and are propelled by four motors.

The cars carry a load of about 25 cu.yd. per car. The cost of labor for loading and unloading the flat cars was apprximately 5 cents per cubic yard more than with the Differential dump cars.

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Graphs of European Tramway Statistics

THE accompanying graphs are from a report on "Fares in Northern and Central Europe," read at the Homburg meeting of the Internationaler Strassenbahn Verein last September by August Winter of the Vienna Municipal Tramway. An abstract of this report was published in the ELECTRIC RAILWAY JOURNAL for Nov. 29. In these charts, the author gives the relations between the lengths of tramway lines, passengers carried, and populations of the districts served for some 47 systems in northern and central Europe from which statistics were collected. These statistics were divided into four groups as follows: (1) systems in German cities; (2) systems in Norway, Sweden, Denmark and Holland; (3) systems in Switzerland; (4) systems in the various countries formerly forming the Austro-Hungarian monarchy.

Chart Fig. 1 shows the relation between the length of route, measured in kilometers (or miles) of single track, and the number of inhabitants in the city served.

The second (Fig. 2) shows the relation between car-kilometers (or car-miles) run and length of line. This the author calls service load and it might be considered an index of service. As will be seen, the line rises rapidly with the size of city served.

The third (Fig. 3) shows the relation between car-kilometers (or car-miles) per unit length of track and population of the city served. This the author calls service density, and plots two lines to indicate the averages in each of two groups; i.e., German and all other roads. It will be noticed in both lines that the ratio of car-miles to miles of route increases with the size of city served, but in varying degree.

The fourth (Fig. 4) shows the number of passengers carried in cities of different size, and the chart Fig. 5 shows annual rides per inhabitant in cities of different size. This index is usually known as the riding habit. In both of these charts, as will be noticed, the curves take the general form that might be expected in American cities, though the lower riding per inhabitant in the German cities as compared with the other groups is very marked. Of the groups outside of Germany, the Swiss roads seem to show the greatest riding per inhabitant. Some of this additional riding may come from the greater number of tourists in the Swiss cities.

The charts as presented originally showed metric dimensions only. English equivalents have been added.

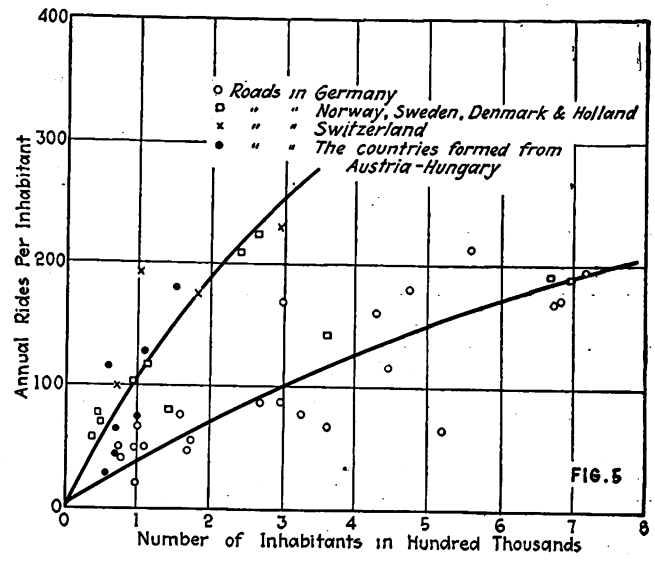
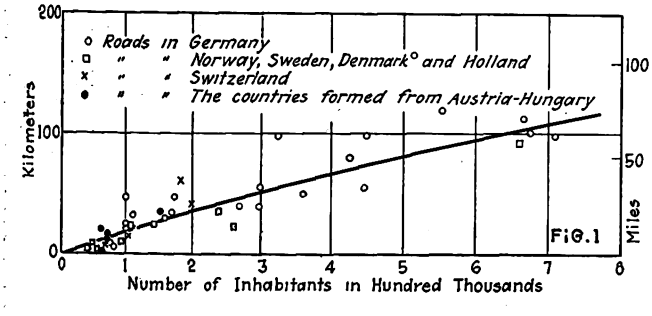
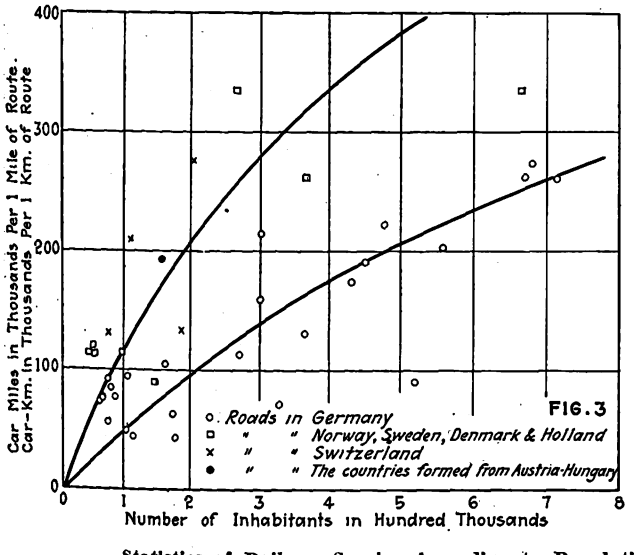
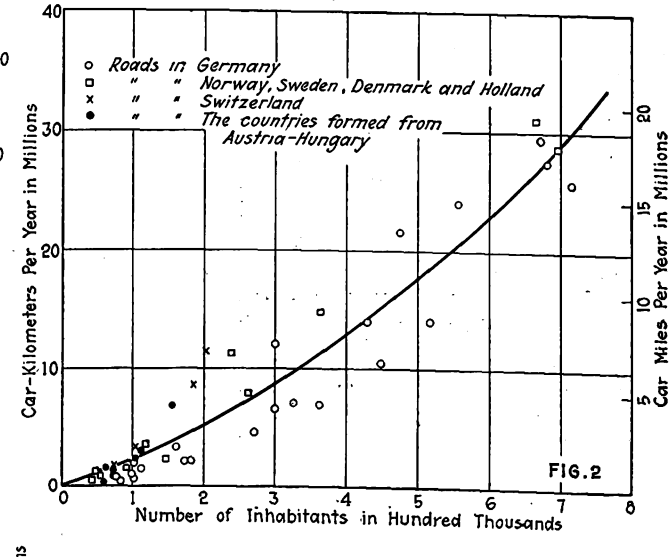
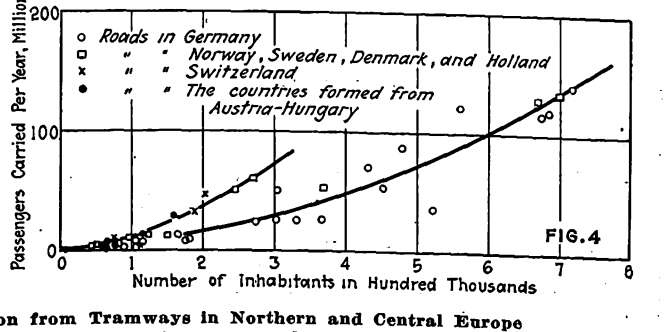


Fig. 5—European Tramway Statistics: Rides per Inhabitant in Cities of Different Size









Statistics of Railway Service According to Population from Tramways in Northern and Central Europe

Fig. 1—Route lengths in cities of different size.
Fig. 2—Tramway service given per inhabitant in cities of different size.
Fig. 3—Service per unit length of route in cities of different size.
Fig. 4—Passengers carried in cities of different size.

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Association News & Discussions

New Yorkers Discuss Interurban Service

Light-Weight Cars, Motor Trucks, Freight Traffic and Fare Collection Are Taken Up at the Midwinter Meeting of New York Electric Railway Association—Developments in Gas-Electric Buses, High-Voltage Insulators and Discipline Also Topics

NEW types of passenger cars and methods of operation in interurban service were the features of the midwinter meeting of the New York Electric Railway Association, held at the Hotel Commodore, New York City, on Jan. 22. The opinion generally expressed was that light-weight one-man cars have proved satisfactory and have not only reduced costs but have given better service to the public than the older types of heavy cars.

The morning session was opened with a paper on modern fare collection methods by W. P. Butler, president Johnson Fare Box Company, New York. N. Y. He described the mechanism of the new type "J" automatic coin switch fare box manufactured by his company which was developed with and first applied on the cars of the Brooklyn City Railroad. Speaking of the experience on that property Mr. Butler went on to say:

"There were 220 of these machines installed on the cars of the Brooklyn City Railway more than a year ago, and the result of their operation has been most gratifying to the management as well as ourselves. These machines were not hastily built nor were they perfected without making mechanical changes to meet the full operating requirements. This work required constant study of platform operations over a period of months before it was finally perfected.

"The "J"-type box eliminates the human element. The coin does the work and each coin deposited in the slot gives instantly an audible and visible registration at its value. It provides means for making positive inspection. The conductor is accorded ample means for observation of fares deposited. He can see, in most all cases, what is being placed in the slot; if he is not certain, he has the facilities of the intermediate inspection plate within the fare box. The coin, after registration, drops upon this plate, where clear visibility is afforded, and the coin remains in this position until it is released by the following coin.

"The instantaneous feature of registration occurring with the coin itself provides for maximum collection of the passenger revenue. We are advised that on the Brooklyn City Railway lines, after these devices had been in operation one year, the revenue increase attributed to the Johnson box is 4 per cent. This expressed in terms of money approximates $500 per year per car equipment, which in turn represents in round figures four times the cost of the entire equipment. I do not know of any equipment investment that pays a higher return.

"The speed with which the passenger boards the car and makes fare payments is most gratifying. It has shown conclusively on the Brooklyn operation and on the Public Service of New Jersey, where a test has been in progress for some months, that this box speeds in double-quick time the platform passenger movement and affords a splendid contribution to time saving.

"It has its attraction from the public viewpoint too. The rider appreciates the opportunity of quick fare payment and his uninterrupted passage into the car, where vacant seats may be few. Psychologically, there is a thrill in hearing the bell ring in the register; it is an innovation and it is these things that please. It helps to bring home to the riding public the advantage of having exact fare ready."

In the discussion which followed, C. E. Morgan, president of the association and vice-president and general manager Brooklyn City Railroad, confirmed the statements made concerning the successful experience of his company with automatic fare boxes. H. G. Tulley, president International Railway, Buffalo, said that his company abandoned the use of fare boxes last November. It was felt by the management that the conductor had a better chance to get fares from all passengers if he collected them personally. With multiple-coin fares particularly it is difficult, he said, to be sure that each passenger deposits the right amount. E. M. Walker, president Schenectady Railway, concurred in part. He said that while the fare box is probably ideal for single-coin fare collection, it is not entirely satisfactory with multiple-coin fares.

FREIGHT TRAFFIC

"Freight Traffic — Its Source and Developments," was the subject of a paper presented by F. W. Brown, general superintendent Michigan Railroad, Grand Rapids, Mich. An abstract of this paper appears elsewhere.

In the discussion on this subject F. W. Watts, general express agent New York State Railways, said that his company had put in operation motor trucks supplementing the electric lines and primarily for short-haul service. The trucks had been in service for so short a time that no definite figures could be given as to the financial results. In some cases, shippers had expressed a preference for trucks rather than electric cars, even at a higher rate, because better speed could be made. The longest route on which these trucks are being run is 22 miles, and service is given to some places which are not reached by trolley.

H. C. Stanton, general freight and passenger agent Rochester & Syracuse Railroad, said that company was making a study of the truck business, but as yet had not engaged in it.

T. C. Cherry, general manager Rochester & Syracuse Railroad, suggested the association should take the position that motor trucks engaged in the general transportation of freight should be classed as common carriers by the state and placed under the supervision of the Public Service Commission. This suggestion, on motion, was referred to the legislative committee.

There was no discussion on the paper on "Light-Weight Interurban Cars," by W. J. Clardy. This appears elsewhere in this issue.

LIGHT-WEIGHT INTERURBAN CARS

In the absence of J. M. Bosenbury, his paper on interurban one-man operation on the Illinois Traction System was read by W. J. Harvie, vice-president of the association. An abstract appears elsewhere in this issue.

In a written discussion F. E. Fisher, general manager Illinois Valley division, Illinois Traction, Inc., described some of the things that have been done to facilitate one-man operation with these cars. Spring switches have been installed at all meeting points and overhead frogs at the turnouts. Where single-end sidings are in use the spring switches are so arranged that the operator of the car first arriving at the meeting point can unlock the switch, go into the siding, reset the switch for the main line and then after the other car has passed can back out and proceed without leaving his position on the car. For train dispatching jack boxes have been placed on the poles with telephone sets on the cars. This permits the same train-order system to be used as with the two-man cars. Fare collection is done with Ohmer registers, which are worked by pedals and are so placed that the majority of the passengers can see the reading. Hat checks are issued by the conductor and are collected when the passengers leave the car.

George L. Kippenberger, assistant manager St. Louis Car Company, sketched the extreme conditions of competition now existing due to the development of highway transportation methods. He mentioned the demand that exists among the public for "something new." This has been satisfied to a considerable extent by the motor bus. He feels that an interurban car with

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the same features as those which have been adapted to the de luxe type of interurban bus would draw passengers back to the railway, as it is possible to make them materially better than can be done with vehicles running on the highways. Following the formal discussion a moving picture was shown illustrating the actual operation of the Illinois Traction cars that had been described.

In the informal discussion which followed, J. C. Thirlwall, General Electric Company, remarked that while until recently 1,000 lb. per mile per hour of free running speed was considered the lightest weight that was feasible in an interurban car, recent cars have been built weighing not more than 40,000 lb. for a maximum speed of 50 m.p.h. The reorganized Buffalo & Erie Railway has just begun operating cars weighing 37,000 lb. at a speed running well over 50 m.p.h. With good weather, he said, it would be possible to bring the maximum speed up to 60 m.p.h.

The old idea was that light-weight cars were inherently flimsy. Modern light-weight types, however, have proved satisfactory. The Western Ohio Railway is operating 34,000-lb. cars which stand up well in high-speed service. A similar record has been made by the Dallas-Terrell line. The maintenance of 34,000-lb. cars on this line has been brought to a very low cost. The Kentucky Traction & Terminal Company is operating similar cars up to speeds of 40 m.p.h. After making 330,000 miles per car, the maintenance cost last year, which was the third year of service, was at the rate of 1½ cents per car-mile.

Carl H. Beck, Westinghouse Traction Brake Company, pointed out the necessity for very high braking rates for all cars that have to run in city street traffic. This demand has been met by the variable load brake, which permits the same braking ratio for a full car as for an empty car and makes possible much quicker stops in traffic with resultant reduction in accidents.

An interesting paper on "High-Voltage Insulators and Their Relation to Radio as Affecting Railways" was read by G. B. Smith, engineer Ohio Brass Company. He spoke of a number of the problems of insulation of power transmission lines at 100,000 volts and over. The interference with radio reception produced by imperfect insulation has resulted in finding many defective insulators. He cited a case where radio co-operated to locate a section of track where the bonding was poor, so that the railway was able to correct the difficulty. An interesting development mentioned by Mr. Smith was the use of high-frequency currents for telephoning over power transmission lines. He said that this made it possible to transmit messages where the use of ordinary telephone lines was impossible and assisted materially in assuring continuity of power service. Following the presentation of his paper, Mr. Smith showed a number of lantern slides illustrating different methods of controlling high frequency discharges and the effects of screening to prevent flashovers.

A paper describing the development of gas-electric buses was presented by J. C. Thirlwall of the General Electric Company. This was discussed by J. A. Queeney of the Philadelphia Rural Transit Company. Abstracts of this paper and the discussion are published elsewhere in this issue.

Dr. F. S. Macy of the Brooklyn-Manhattan Transit Corporation presented a paper in which he discussed the essentials of discipline. This also is abstracted elsewhere in this issue.

The afternoon session was concluded by a short progress report by the accountants' committee of the association, which was read by its chairman, E. H. Reed, auditor Brooklyn City Railroad.

The principal speaker at the dinner was Clifford E. Paige, vice-president Brooklyn Union Gas Company, who said that public sentiment was changing in favor of the public utilities since they have been giving more attention to winning the confidence of the public. The street railways are now advertising their business more extensively than ever before. Their best salesmen, however, must be "contact men"—conductors or motormen. Courtesy, he said, is never an accident but always a development, which should be fostered in all those having to deal with the general public.

President Morgan announced that this was the largest meeting the New York Association ever held, some 750 being present at the banquet. Nine past-presidents of the association were in attendance. J. K. Choate responded for these past-presidents with a few fitting remarks. The meeting concluded with a humorous address by the Rev. W. W. Giles of East Orange N. J., who spoke on "Personality—The Business Man's Greatest Asset."

Interurban Freight Traffic—Its Source and Development*

Importance of Developing Additional Source of Revenue for Interurban Properties—Use of Motor Trucks in Connection with Electric Railway Lines Opens Up New Possibilities—Joint Rates and Through Billing Important

By F. W. Brown
General Superintendent Michigan Railroad, Grand Rapids, Mich.

FREIGHT traffic handled by electric lines in the last 10 years has increased fourfold, the freight car-miles operated have increased two and one-half times and the freight equipment has been doubled. This of itself ought to be a convincing argument in favor of freight traffic as an undeveloped source of revenue.

Many electric line managers now recognize that the greatest opportunity for development lies in freight service, and realize that the standardization of equipment, the possibilities of more through and competitive rates between cities and stations, the operation of longer trains, and the loading of cars to capacity are all important factors to successful and profitable freight transportation.

There are still a number of difficulties that have not been overcome, not the least being that so many of the lines operate over city tracks, and are therefore subject to municipal regulations as to the hours during which they may haul freight cars, or the number of cars in such train, also the type of equipment required by such municipalities.

On the side of personnel, it is important that all the employees be efficient. One incompetent or disagreeable employee coming in contact with the public will offset the work of several capable and excellent men. To be more specific—I would say that one local freight agent who is curt, or has not the faculty of meeting and pleasing the public, can do more harm than can be overcome by several solicitors, or by several months of first-class service. Therefore, the right men should be engaged as local freight agents, the right sort of solicitors put in the field, and the right men to handle freight claims are essential to the success of the undertaking. To be too saving in salaries at this point might easily be fatal to the whole project. Any solicitor who cannot increase the business five times over and above his salary is in the wrong field.

Sources of Freight Traffic

Where can we look for traffic? First, in our own immediate territory; second, in adjacent territory. It is astonishing how much new business a solicitor will find in a territory that he has worked over and over again, by knowing intimately all the sources of traffic, and the men who control it, and by acting promptly on tips he receives, or things that come under his observation, often accidentally caught from some casual source.

Another feature, and one which has not been greatly developed, is to use truck lines for reaching towns not now served by electric railways. From nearly every terminal of any importance there are truck lines operating to villages and towns within a radius of 30 miles, that should become feeders of the electric line, through rates and through billing being provided. In other words, the truck line in this case would become an extension of the electric line. There is no reason to believe but that such service can be successfully developed, and is one of the fields now open to electric lines. Any number of localities not well served by steam roads on account of their location on branch or short lines would be susceptible to a far greater develop-

*Abstract of a paper before the New York Electric Railway Association, New York City, Jan. 22, 1925.

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ment if they had better transportation facilities. It is not meant by this that the truck, in connection with electric lines, is expected to deprive the steam railroads of their business, but that with additional transportation facilities there will be more traffic to move. This co-ordinates the truck and the electric railway to the mutual benefit of both.

Electric railways should endeavor to locate industries on their lines, and while it has not yet become possible in all cases to handle standard M.C.B. equipment in road haul, as all lines are not physically able to do so, and also because of the objection of steam roads to pro-rating with electric railways, for the present revenue may be obtained from handling such equipment in a switch movement. However, we should not say that the electric lines should not expect to be able in the not far distant future to move traffic in connection with steam railroads. There are a number of the larger steam lines which have fought this for years, but there are signs of a break among some of the other lines, and I believe it is not impossible, with the right kind of effort, to establish joint rates in connection with certain steam lines, very much to the advantage of the electric. In view of the experience of the past this may seem a bit visionary, but it is not so; we have not gone after it half hard enough.

Another opportunity that is opened can best be presented by relating an actual experience: An electric railway served a celery-growing district and had for a number of years counted on that business as certain. It was regular until the motor truck came into the field and picked up the celery at the grower's place and transported it direct to the market, some 25 miles distant. The representative of the electric immediately started to develop another market for this celery and, after bringing the commission men from another city and growers together, succeeded in developing a business the second season that totaled 100 carloads. The new market was 200 miles distant and is not likely to be affected by the motor truck.

THROUGH RATES IMPORTANT

Through billing and competitive rates should not be overlooked. Agents should be able to quote promptly the through rate to as many points as it is possible to establish. A truck haul between two terminals may be necessary, but that can be arranged; make the truck line part of the through transportation and participating in the through rate; but where lines can be made to connect, through cars should be run.

These cars should serve the double purpose of affording the shipper the through service and saving the cost of frequent handling. Every time a shipment is handled it adds from 50 cents to 75 cents to each ton so handled, depending on the volume. The through rate, and especially the through service, appeals most to the shipper and increases the importance of the electric railway in his mind.

One other matter I should like to mention. That is to appeal to managers not to handicap their traffic departments by failure to furnish facilities for the development of freight traffic. Many a traffic manager has become discouraged when he sees where business can be obtained but cannot be handled for lack of terminal facilities, or other conveniences necessary. Additional facilities, oftentimes provided with the expectation that such would take care of the needs of the traffic department for some time, are found to be taxed to their utmost in a very short period after being provided.

Essentials of Discipline*

Principles Underlying the Methods Used by a Large Electric Railway in Obtaining Loyalty and Co-operation from Its Employees

BY F. S. MACY

Physician-in-charge, Medical Bureau of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

DISCIPLINE is essentially teaching, training, the cultivation of some particular belief or code, education in some especial occupation or profession. Industrially, discipline is any method, system or kind of training designed to accomplish profitable results by regulated, co-ordinated, combined efforts.

Good discipline begins with the proper selection of employees. Given the men, the next point is in recognizing the principle that control of the mass is based upon the control of the individual. All discipline narrows down to that. And the secret of controlling the individual lies in knowing and in understanding every employee to the limit of our ability in that art. In addition certain conditions must be fulfilled or fostered as the case may be. For instance, respect for himself and his boss; for he cannot give the full measure of return to his company unless he respects it, and he cannot respect it unless he honors himself in working for it. And he must respect his boss because he is a disciple of the boss, who, to him, the employee, typifies the company. Courtesy is one road to respect. "Please" and "Thank you" are the most powerful words in industry. They make unnecessary many pages of rules, because they prompt consideration and forethought.

Courtesy, to be exacted from the men, must be punctiliously extended to them by their chief. A man must not be treated like a yellow dog if he is expected to act and to work like a thoroughbred. Before a man can respect himself and act like a man, he must be treated like one. Even in reprimand, cold, calm courtesy is a weapon that baffles all offenders because it admits no rebuke in reply.

An employee must be loyal, otherwise he is an indifferent worker and a mere time server, so that his product falls below the standard of excellence that it is the object of discipline to maintain. Loyalty, like respect, is mutual if it is genuine. It is the cultivation of this spirit, mutual respect, mutual loyalty, mutual confidence in and fidelity to one another and the common code, that forms the basis and the very structure of military discipline and national security. We can have no better model.

It is usually easy enough to get men. It is quite another thing to keep them, to train them into a high state of efficiency and to hold them after they are trained and hence most valuable. Nothing else helps in this respect so much as these few principles so briefly outlined. The individual must be intelligently studied and analyzed, so that he may be fitted into his right place as a cog in a machine; he must respect and be respected. He must be loyal, and the company must be faithful to him. The net result is an appeal to the sense of personal possession. The man comes to look upon the company as something so intimately associated with himself as to be, in a sense, his own; the object of his affection and pride, upon whose prosperity his own depends, in the spirit of which he lives and for which he would die, and not seldom does, especially in the railroad industry.

So much depends upon the superintendents or the immediate bosses of the men in cultivating the essential qualities of concerted effort that a corporation is largely what these men make it. Personal bias or preference manifested in the guise of office are fatal to discipline. The privileges the boss confers, the preferments or promotions he recommends must have no foundation of friendship. On the contrary, to promote, for example, a man on his merits but known to be personally distasteful to the boss, is a master stroke of discipline when the occasion justifies it; because it is a visible evidence of a square deal, an advance untainted by personal considerations. And just as he must not be influenced by personal favoritism to confer privileges, so, too, he must not use his official position to obtain favors for himself. To borrow money from subordinates, for example, or to gamble with them, is worse than dangerous.

Yet the personality of the chief is bound to be reflected in his performance of duty, nor do I maintain that it ought not to be. Indeed, the right kind in the right way is necessary. Neither do I mean that he should not do humane, kind things officially when I say that his office is impersonal. On the contrary, he should study to do those things for reasons I have given. But I do make a distinction between personality in the sense of character and personal attributes as biasing factors in office.

When I say that the chief should be approachable I have in mind what I call the open-door policy. This consists simply in giving every man a hearing

*Abstract of a paper before the New York Electric Railway Association, New York City, Jan. 22, 1925.

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no matter how perfectly the merits of his case may be known. If for no other reason the practice is desirable because it adds to general confidence, and to the chief's fund of information about men in general. One can always get a new viewpoint, useful, perhaps, on some other occasion. Besides, no matter how thoroughly subordinates are trained in the policies of the boss, as they must be, differences are bound to arise and it is one of the most important duties of the chief to see that these are adjusted.

Occasionally it will be found that the man is right and the chief's assistant wrong. In such cases the assistant must always be sustained, in appearance. The chief should hear all parties concerned and then follow up the case to conclusion, as an added source of information concerning the qualifications of his personnel, and to assure himself that justice has been done. He must also be equally scrupulous in analyzing himself and in correcting such mistakes as he himself may make. It takes a big man to say to his inferior, "I am wrong in this case," but he seldom loses by doing so.

The open door naturally suggests the closed door; in other words, punishment, which is often confused with discipline itself. Appreciation, commendation, appeal to the common spirit, are often far more effective and better means politically of securing or maintaining discipline. Nevertheless, punishment is a valuable and necessary aid in appropriate cases, though theoretically it is a confession of weakness, an admission of inability to cope with a situation intellectually. Sarcasm, loud bawling, angry epithets, are cowardly and weak because they admit no official reply or explanation and reduce a judicial process to a personal quarrel. For the same reasons, no man should be allowed to be impudent or disrespectful to his chief. The boss should put him out and resume the matter when, and as soon as, it can be settled coolly and judicially; and if he finds his own gorge rising to the spillway he should promptly dismiss his man until he can control himself.

Know everything that is going on; not by spying or through spies, but in the open with keen ears and keener eyes. Let praise or approval be bestowed in the open. But let reproof and reprimand be administered behind the closed door. Public humiliation destroys self-respect and antagonizes all who witness it.

Punishment or penalties should seem to be the natural consequence of the offence. They must therefore be appropriate, even ingenious, and duly proportioned to the circumstances, but never degrading.

Discharge is a terrible thing, both economically and humanly. It deprives the company of a man more or less trained, and it causes human suffering. Yet it is necessary at times, for the good of the whole. It has but one legitimate function, the elimination of the hopelessly unfit, the incurable agitator who undermines the common prosperity and the man who has proved himself temperamentally or otherwise not amenable to any constructive influence. But remember that the incorrigible and the incompetent may be only square pegs jammed into round holes.

One cause of resentment among men at being penalized is the feeling that the boss is on a plane so much higher than themselves that he cannot understand them. To overcome this I devised what I called a "Discipline Board," composed of an odd number of men with excellent records and suitable qualifications in general. Complaints and infractions were referred to this board. I retained the approving and amending powers, for obvious reasons. and made it plain that the board was advisory only. I often mitigated, but I never exceeded their findings if these were adverse to the man concerned.

This board accomplished several things. Men felt that they had been tried by a jury of their peers, and there was never a question of fair treatment. Membership on the board was an expression of the highest commendation and furnished a wonderful incentive to good work. It provided me with a number of men undergoing practical training in the judicial side of management from whom I could choose a tested assistant as occasion arose. It operated as a buffer between the men themselves and the consequences of individual prejudice or misunderstanding. It strengthened rather than weakened my own position by promoting contentment and inspiring confidence in me as a man and an official. Incidentally it saved me some terrific strains on my temper.

Now comes the question, how may one judge whether discipline is good or bad? Here are a few tests:

Is the quality of the output what it should be?

Do the men work willingly and come to their duties promptly and cheerfully?

Are there incentives such as the prospect of advancement, pension, etc.? In other words, can they see something ahead for themselves? These are essentials to contentment, and contentment is necessary to loyalty or company spirit.

What is their opinion of the boss? It ought to be that he is a fine man who can be hard as nails when occasion demands.

All things considered, is the labor turnover high or low? If it is high there is something wrong in working conditions. Too often it means injustice and wrong principles of control; poor production as a result of untrained and discontented workmen and consequently too high an overhead and lower profits.

Is the sick rate higher or lower than conditions warrant? The higher the rate the more likely it is that men are malingering to escape hateful conditions and that they are therefore lacking in loyalty. In general, too high a sick rate has the same significance as an excessive labor turnover.

Are punishments and penalties imposed in excessive numbers? A high punishment rate reflects discredit upon the boss, as a rule, and indicates a fault in his ability to understand and train his men. On the other hand, an exceedingly low rate must not be taken as an index of high discipline without corroborative indications.

Finally, analyze every disciplinary incident. Take it apart and see how it is humanly made. There is a lesson in every one. Superintendents should discuss their difficult cases with one another; transfer them from one to another to observe the effect of change of environment and personality on efficiency. Indeed, if the art of discipline had been sufficiently cultivated in the beginning, the necessity for organized labor would never have existed; and if the art were even now as far advanced as it should be, the organized labor would have no justification. Discussions, experiences, opinions, all are productive. I offer you mine for such service as they may render.

Results with Light-Weight Interurban Cars*

By J. M. Bosenbury
Superintendent of Motive Power Illinois Traction System, Springfield, Ill.

THE Illinois Valley division of the Illinois Traction System, consisting of approximately 101 miles of road, was originally built about 20 years ago. It was equipped with heavy double-truck two-man interurban passenger cars weighing approximately 94,000 lb. each and seating 56 passengers. These cars were operated on hourly schedules, but the decrease in business caused the operating officials to reduce the service to headways averaging about 2 hours, with few trippers morning and evening

An analysis of the factors involved showed that the solution of the problem was a light-weight one-man interurban car. With this idea in view, the officers of the company directed the engineers to design a car that would as nearly as possible meet all of the requirements of the traveling public. Comfort and attractiveness were considered most desirable. This was provided by use of more comfortable seats. better heating and ventilation, better toilet facilities, easier egress and ingress and a pleasing appearance, both inside and outside. The car was equipped with all of the modern safety appliances and labor-saving devices. While it was of light weight, strength and safety were not sacrificed to obtain the desired result.

It was also considered that the car must be of an entirely new design, that would embody all of the good features of past practices and at the same time all desired new developments, incorporated in a car that would appeal to the traveling public and also be easily operated on an interurban line by one man.

The resultant car in general is a single-end, double-truck one-man interurban car with arch roof, having the main passenger compartment at the front and with a combination smoking, baggage and express compartment in the rear. [This car was described and illustrated in the ELECTRIC RAILWAY JOURNAL for Jan. 10, 1925—ED.]

Particular attention was paid to insulating the car, both the roof and the side girder plates. To make the car

*Abstract of a paper before the New York Electric Railway Association, New York City, Jan. 22, 1925.

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more comfortable in extremely cold weather, storm sash are mounted over the lower sash in long sections. These storm sash have small ventilators at the bottom, which may be operated from the inside of the car. The upper or Gothic sash are prevented from radiating heat by being protected on the inside with a ⅛-in. mahogany veneer panel, which gives a dead air space. This panel is hidden by the curtains which are arranged to stop with the lower edge at the top of the movable sash. This provides clear vision at all times. The car being single-ended, with the main passenger compartment in the front portion and without a front bulkhead, provides the passengers with a clear and unobstructed view of the track ahead and of the surrounding landscape.

The new service was started on an hourly schedule on Aug. 3, 1924, and operated in this manner until Aug. 20, at which time an unprecedented storm accompanied by a cloudburst washed out a number of bridges and embankments. These unfortunate occurrences cut the line into several sections, making it impossible to operate through cars and maintain full service. So much damage was done that the reconstruction of the bridges and track was not completed until Dec. 4. Therefore, sufficient operating statistics to show the value of this new service are not available. However, the manner in which these cars were received by the public and the officials of the communities through which they operate, and the many former patrons that had been lost to other forms of transportation that have returned to these cars, indicate that they are meeting expectations, and that portion of the December report that is available indicates increased earnings and decreased operating expenses, which latter was materially affected by a large decrease in power consumption.

Gas-Electric Drive for Buses*

Experience with Vehicles of This Type During the Past 20 Years Is Outlined—The Advantages Are Claimed to More Than Offset the Greater Weight and Original Cost

By J. C. THIRLWALL
Railway Engineering Department General Electric Company

MANUFACTURERS have been building various forms of gas-electric drives for rail cars, automobiles, buses, tractors and ships for 20 years or more, and a great deal of such equipment has been put into actual operation. In 1905 a single-deck bus was built for the Fifth Avenue Coach Company that was driven by a gas-electric set built by the General Electric Company. This weighed about 9,400 lb. and used a 40-hp. four-cylinder engine to which was attached a 12-kw. generator. Two motors were used with chain drive and a double-reduction gear, giving a maximum speed of 15 m.p.h.

Three years later 10 more buses were put into service by the Fifth Avenue Company, with similar equipment. These operated for about 6 or 7 years before being retired. The only criticism of their performance was the inferiority of their engines as compared with the De Dion type that had been adopted by the operating company for its other buses. Due to relatively lower engine speeds, the weight of the electrical equipment per kilowatt capacity was considerably higher than it is today. Nevertheless, these buses, designed throughout for the electric transmission, weighed only 347 lb. more than the buses with mechanical drive. A single-motor vehicle built in 1910 actually weighing 70 lb. less than the mechanical type, operated until 1917.

About this time the Tillings-Stevens Company in England began development along similar lines and since has carried it forward to a point where there are today in successful operation numerous fleets of these gas-electric buses totaling some 1,500, about 300 of which operate in London.

In 1912 we installed a considerable number of gas-electric equipments on heavy-duty trucks, notably airial ladder trucks for fire departments, street sweepers and commercial trucks of from 2 to 5 tons capacity.

In 1918, at the request of the War Department, we designed and built 90 mobile searchlight power units, one of which served at the front-line trenches in France. These trucks, weighing 9,000 lb., used an 80-hp. Cadillac engine and a 20-kw. generator and single motor. On test in February and March, 1919, one of these units went from Massachusetts to Florida and return, through exceptionally muddy clay roads, without a failure in any part of the driving mechanism. The first American tank had gas-electric drive, and two 80-ton 240-mm. gun mounts were similarly equipped.

During the same period, 1905 to 1915, we built some 90 rail car equipments, using 100-kw. generators with 175-hp. engines in combination passenger and baggage cars that weighed from 45 to 55 tons. A considerable number of these cars are still in active service after 15 years. Several of somewhat lighter weight have been sold during the past year.

An even more extensive commercial development was made in storage battery trucks, thousands of which are today operating in every class of commercial trucking. The American express Company, for instance, has a number of fleets of battery-driven delivery trucks aggregating some 1,600.

About a year ago Mitten Management, Inc., having decided to engage extensively in bus transportation and realizing the disadvantages of the standard mechanical drive, asked us to submit a sample gas-electric equipment that would enable it to dispense with the differential and to use a dual drive. It felt, as many other operators do, that the differential itself is an inefficient and weak part; that it promotes skidding and wheel slippage in starting on slippery streets; that the hump in the center of the axle necessitates carrying the body higher than is necessary with dual drive. To build a mechanical dual drive appeared impracticable. With electric drive, it merely meant the use of two motors, mounted side by side and connected to two driving shafts.

Other objections to the ordinary automotive drive are the clutch and gear shift, which are short-lived, high maintenance parts. Moreover, as ordinarily used by drivers, they are weapons of mechanical assault and battery on the engine, chassis frame, bearings, and tires. In other words, the ordinary rapid acceleration of a heavy bus, with a gear shift, is a series of terrific torsional strains and of excessive engine speeds, that shorten the life of the engine, of the gearing, of the tires and of the whole vehicle.

Electric drive reduces the severity of the torsional stresses, applies the power in a smoother and more constant manner, greatly reduces the peaks of engine speed, and in frequent stop service appreciably reduces the number of engine revolutions per mile. The reduction in speed permits the use of higher compression and, together with the higher thermal efficiency of moderate engine speeds, results in fuel economy.

In frequent-stop service a driver will make from 1,500 to 2,000 shifts of the gears in a 9-hour day. The physical and mental strain of performing this duty is considerable. In addition, each shift requires that the driver take his hand from the wheel, and to some extent distracts his attention from the steering of his car. With the electric drive the entire speed control is in the foot accelerator and he need never take either hand from the wheel except to apply the emergency brake.

For the reason just mentioned, and because there is less danger of skidding, the passenger rides in greater safety. He is less apt to be thrown while standing in the aisle as a result of jerks in starting, and his comfort is enhanced by the lack of noise and vibration that is ordinarily so noticeable.

Equipment developed for use on the larger size buses, tests of which have been made in Philadelphia during the past eight months, includes a 25-kw. generator, weighing approximately 900 lb., directly connected to the engine. The particular engine used in the P. R. T. tests was a six-cylinder machine that developed 60 hp. at 1,200 r.p.m.

On its shaft has been mounted the armature of an exciter provided to obtain instant pick up of voltage as the engine is accelerated. (One of the objections to previous designs was a lag in voltage pick up that reduced acceleration of the buses.) The generator has a main series field and an auxiliary shunt field that is energized

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by the exciter. The series windings build up a magnetic field in opposition to that created by the shunt winding, giving a nearly constant power, the voltage drooping at high current output and increasing as the current drops. There also is a neutralizing effect at low speeds, so that when the engine is idling the voltage generated is so low as to produce a negligible current throughout the motors. They can, therefore, be permanently connected to the generator.

While the generator has a nominal rating of 25 kw. in actual tests, its output varied from 500 amp. at 70 volts, or 35 kw., to 160 amp. at 200 volts, or 32 kw. Under tests that boiled the radiator of the driving engine it operated within safe temperature limits.

Two motors, weighing 440 lb. each, of the automotive type, barrel shaped, and of about 20 hp. on a railway rating, were used in these tests, with a double reduction gear ratio of 10.8/1. With this combination on a double-deck bus, which without load weighed 16,870 lb. and with full load approximately 26,000 lb., free running speeds of from 26 to 30 m.p.h. were obtained, depending upon the loads carried.

Rates of acceleration were very uniform, approximately 2 m.p.h.p.s. up to 10 m.p.h. and 1.5 m.p.h.p.s. up to 15 m.p.h. being the average of many tests. It was found that the buses with mechanical drive could equal these rates, but only by racing the engine through holding too long in intermediate gear positions. The normal engine speeds while accelerating with the gas-electric drive were between 600 and 1,300 r.p.m. The maximum engine speed (at 30.5 m.p.h. bus speed) was 1,550 r.p.m. On hill-climbing tests, on grades of from 5 to 8 per cent, the engine speed varied only between 1,150 and 1,325 r.p.m.

With mechanical drive on second or third gear position engine speeds of 2,000 to 2,200 r.p.m. were frequently reached, and readings as high as 2,600 r.p.m. were noted, depending on the individual driver and his methods.

Schedule speed tests gave similar results. On various runs involving from three to nine stops per mile the drivers of the gas-electric bus established uniform records of schedule speeds. It was found that for short periods drivers on the mechanically equipped buses could, by abusing the equipment, get over the course in approximately the same time, but they all admitted that to maintain such schedules all day would be physically impossible.

The electric equipment and the dual-drive axle add some 1,800 lb. to the weight of a 66-passenger bus, less than 8 per cent of its loaded weight, and approximately 10 per cent of its first cost. Those are the only apparent disadvantages.

Against these may be set the greater comfort and safety for passengers and crews, lower maintenance and reduced depreciation on the entire bus and its equipment, greater mileage per gallon of gas or of oil, and higher schedule speeds.

Philadelphia's Reasons for Gas-Electric Buses*

Constant Starting and Stopping of Buses in City Service with Clutch and Gear Shift Produces Strains in Body and Chassis That Result in Mechanical Trouble and Short Life of the Bus

BY J. A. QUEENEY
Philadelphia Rural Transit Company, Philadelphia, Pa.

SIX weeks ago the Philadelphia Rural Transit Company, which is the motor coach organization of the Philadelphia Rapid Transit Company, purchased 200 gas-electric motor coaches, 125 of which are 66-passenger double-deck coaches and 75 of which are 33-passenger single-deck coaches. The Mitten Management has been studying the subject of motorcoach operation for several years. During these studies the conclusion was reached that in cities where motor coaches are in operation the street railway continues to carry a certain proportion of the people transported over the streets of that city and increases that proportion as the population grows. In cities where motor coaches are not in operation, the percentage of the people carried by the street railway decreases as the population grows, or, in other words, the private automobile increases in number and carries a larger part of the people transported over the city streets. With these facts before up, Mitten Management decided to supplement its railway system with the motor coach.

With a few exceptions, the type of buses in operation in various cities was really a truck chassis with a body mounted on it. We found it to be the opinion of bus operators that the life of the bus was somewhere between 3 and 5 years, a most startling situation to us who are accustomed to dealing with street cars whose life is admittedly not less than 20 years. We found that not only was the life of the bus relatively short, but its operating costs much higher than those of a street car of the same capacity, so we devoted much time to find the reasons for the shorter life and the higher cost of the motor coach.

In the Dec. 13 issue of ELECTRIC RAILWAY JOURNAL appeared an article by B. Hilburn, general manager Tulsa Street Railway, Tulsa, Okla., which summarized the defects of the ordinary mechanical drive of the gasoline bus and the rapid deterioration of the vehicle that results. This sums up in a few words one important reason why we decided to adopt the electric drive instead of the mechanical.

As a result of our studies we drew up what I might call fundamental specifications covering a gas-electric double-deck coach that would seat not less than 65 passengers and a 33-passenger single-deck coach the chassis of which would be an exact duplicate of the double-deck for the purpose of standardization. Our specifications stated that the electrical apparatus must have sufficient capacity to transmit the entire output of the six-cylinder 4x6-in. engine which we had designed and operated in order to demonstrate its advantages over the four-cylinder type.

The General Electric Company supplied all electrical equipment for the first coach, which consisted of generator, two motors and a reversing switch. The clutch, gear shift, transmission and rear axle of one of our 64-passenger double-deck coaches were removed and the generator and two motors substituted.

We placed the gas-electric coach on test alongside of an exact duplicate coach equipped with identically the same engine and conducted a series of tests extending over a period of months. We found that the gas-electric coach would accelerate rapidly, smoothly and quietly, being free entirely from the noise, shocks, stresses and strains set up in the mechanical drive coach, because of the abrupt changes in speed and torque as gears are shifted, depending largely upon the skill of the driver of the mechanical bus.

Incidentally, we learned that it was adsolutely impossible to stall the engine of the gas-electric; i.e., with the coach at rest, you can instantly push the throttle wide open and the gas-electric coach will automatically accelerate to its free running speed rapidly, smoothly and quietly.

The faster schedule that can be operated with the gas-electric coach, because of the elimination of the time required in operating clutch and gear shift, is most important when we consider that our largest item of operating expense is trainmen's wages, which of course are materially reduced as the schedule speed is increased.

All of our tests and operation to date indicate, and I am convinced, that the tire mileage of the electric drive coach is very materially greater than the life of the same tires on the same coach with mechancial drive, due to the even torque applied to the wheels of the electric drive, while that of the mechanical drive is subject to great variation.

We are convinced that the operating cost of the gas-electric will be materially less than that of the mechanical drive and we base our opinion on our knowledge of the cost of operation of mechanical drive coaches as compared to the gas-electric drive in Philadelphia and various parts of the world, the cost of operating our trolleys and other electric vehicles, together with those facts which have been established during our tests.

I think that it will be interesting to call the attention of our mechanical men to the fact that at present it is the practice of motor coach operators to inspect the coach after it has operated 2,000 miles. This is a purely arbitrary decision. The inspection is a most costly one and includes removing of head of engine, cleaning out carbon, cleaning and grinding of valves, renew-

*Abstract of discussion before the New York Electric Railway Association, New York City, Jan. 22, 1925.

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ing of oil, tightening of bearings and inspection and adjustment of numerous other parts. After the inspection is complete it is doubtful whether the engine is in such condition that it will operate at an efficiency of 90 per cent, 80 per cent or 70 per cent. The mechanic simply knows that the carbon has been cleaned out, that the valves looked good and that the engine is operating smoothly, without knocking. After it is operated 2,000 miles it is brought in again and the same procedure gone through, without knowing whether it is necessary or not. With the gas-electric the exact condition of the power plant can be readily determined by simply connecting the generator to a water rheostat, taking the speed of the generator, and the output at once determines the exact efficiency of the power plant.

The inspection and adjustment of the gas-electric equipment is therefore based scientifically on the work actually performed by the vehicle and not arbitrarily based on general experience. To obtain the same information with the standard mechanical-drive coach it would be necessary to remove the engine of the coach and connect it to a dynamometer, which of course is prohibitive because of the expense involved.

Gas and Oil Consumption on Gas-Electric vs. Mechanical Drive

The question that has been asked more often than any other, and consequently I assume is of great importance in the minds of those who make the inquiry, is, "Is the gas and oil consumption of the gas-electric greater than that of the mechanical drive?" I am afraid that many of the engineers and motor-coach operators have given more thought to the problem of increasing the miles operated per gallon of gas and oil than they have to the reduction of other expenses that go to make up the operating cost. As a matter of fact, the oil consumption of the engine of the gas-electric is approximately but 50 per cent of that of the engine of the mechanical drive, which the gas consumption is approximately the same, slightly in favor of the gas-electric.

The gas-electric coach has this further advantage, which is probably of particular importance to the operators of the smaller properties, and that is that the gas-electric with its motor drive is much closer to a street car and therefore in operating and maintaining it there will be less departure from standard street railway practice, particularly in the maintenance of the equipment, than with the standard mechanical drive bus, so that your present street railway equipment organization, because of its familiarity in the maintenance of electrical apparatus, will have no difficulty in caring for the gas-electric equipment.

On the contrary, the standard mechanical drive bus, in my judgment, requires a new force of men trained and experienced in the maintenance of the clutch, transmission and differential, which is entirely foreign to street car equipment.

Light-Weight Interburban Cars*

Results from Thirty-eight Properties Show Marked Economies and Other Gains—Most Desirable Features of Equipment Are Discussed

By W. J. Clardy
Railway Engineer
Westinghouse Electric & Manufacturing Company

During the past 3 years a number of interurban properties replaced rolling stock with modern light-weight equipment and several interesting types of cars are now in service. An analysis of car weights between 25,000 and 60,000 lb. on 38 interurban properties which have purchased new equipment in the past 3 years indicates that the cars may be divided into three classes: (1) 25,000 to 32,000 lb. cars; (2) 32,000 to 40,000 lb. cars; (3) 50,000 to 60,000 lb. cars.

The first class includes 80 cars in service on 15 properties, and the average weight for this type of equipment is 28,000 lb. complete. The application of these cars has been confined to properties that have comparatively low schedule speeds which do not require free running speeds in excess of 45 m.p.h. Twenty miles per hour is a representative schedule speed for this class of service.

The average weight of the cars in the second group is 36,000 lb. complete, and a total of 152 cars distributed among 17 properties are considered. Most of the service performed by this equipment is of the same character as that in which the 28,000-lb. cars operate, that is, comparatively low schedule speeds requiring balancing speeds not exceeding 45 m.p.h. However, on a few properties, the 36,000-lb. equipments are applied in what may be termed high-speed service. In these instances schedule speeds of 30 m.p.h. are made, and the cars are capable of attaining free running speeds of 55 m.p.h.

The purchase of cars of the third class has not been extensive. Six properties are considered that are operating 137 such cars, and the average weight of these equipments is 57,000 lb. complete. Seventy-three per cent of the cars are in service on one property, and 84 per cent are applied where service is of a suburban character that does not require high speeds. The service is similar to what has been classed as comparatively low-speed operation, where schedules of 20 m.p.h. are typical and maximum free running speeds of 45 m.p.h. are not exceeded. The remaining equipment approaches the minimum weight limit of the 57,000-lb. class and has been applied to replace heavy cars in high-speed service requiring balancing speeds of 55 m.p.h.

The cars in the first two classes are representative of the lightest interurban equipments, and it is interesting to see that the average weight of 232 cars on the 32 properties is 33,000 lb. complete. Another important fact is that cars have been built corresponding to all of the even thousands in weight between the limits of 25,000 and 40,000 lb. This variation indicates that it is not practicable to establish definite weight standards for interurban cars to meet certain service requirements. However, the average weights as determined for the three classes will assist in the selection of cars and car equipment.

*Abstract of paper before the New York Electric Railway Association, New York City, Jan. 22, 1925.

Electrical Equipment and Trucks

The application of motors to the three classes of cars considered is instructive in that the influence of weight and service requirements are very definitely pictured. Seventy-nine per cent of the 28,000-lb. cars are equipped with quadruple 25-hp. motors, and the remaining 21 per cent have quadruple 35-hp. motors. In all cases the weight of the cars which are equipped with the latter motor exceeds 31,000 lb. Eighty-eight per cent of the cars in the second or 36,000-lb. class are equipped with quadruple 35-hp. motors, and quadruple 40-hp. motors are applied on 12 per cent. The 40-hp. equipments are used on high-speed cars, and tapped field motors are utilized to obtain good free running speeds on cars which approach the maximum weight limit. In one case the application of the 35-hp. motor on a 34,000-lb. car provides a fairly satisfactory high-speed equipment, but the 40-hp. motor is better suited for this class of service.

The principal equipment used on the 57,000-lb. cars consists of quadruple 50-hp. motors. Eighty-four per cent of the cars considered in this class have this size motor, and 16 per cent are equipped with quadruple 60-hp. motors. In general, the 50-hp. motors are applied on the moderate speed cars, and the 60-hp. motors on high-speed cars. Tapped field motors of the larger size are used in several instances to assist in obtaining the desired high free running speeds.

Remote control is favored on the equipment in the 57,000-lb. class for either single car or multiple-unit service, and drum control is more extensively applied on the lighter cars when operation does not require trains. However, some of the properties which have heavy traffic and are operating the lighter types of equipment use multiple-unit control to solve their problems of mass transportation successfully. They have found that train operation provides the best means of handling a large number of passengers economically.

One interurban road operates a 10-mile line joining two moderate-sized towns which are manufacturing centers. New 36,000-lb. cars equipped with qaudruple 35-hp. motors and multiple-unit control were recently placed in service and are proving very satis-

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factory. Two-car units are provided to handle the heavy traffic to and from the industrial plants during rush hours. The excellence of the service secured from these equipments is striking when compared to previous operation with single cars. A Western property operating 59,000-lb. cars finds multiple-unit control a necessity to provide equipments capable of meeting the severe requirements of a heavy suburban traffic.

The small-wheel trucks which are practically a universal application on the class of equipment considered are well standardized and are very successful in providing good riding qualities. Twenty-six-inch wheels are used on 97 per cent of the cars, while the remaining 3 per cent have 28, 30, or 33-in. wheels. Truck springs require careful attention, for in a number of cases it has been necessary to make changes in springs to secure satisfactory riding qualities.

Car Fittings

In the light-weight interurban cars enumerated, careful attention has been given to the planning of every detail of the car body. The factors which have the greatest effect on bodily comfort are necessarily of first importance, and the principal items which have received exhaustive study are seat design, heating equipment, ventilation, type of windows and lighting system.

Plush seats are favored for main passenger compartments, and leather or some type of imitation leather for smoking compartments. On some cars folding slat seats are provided in baggage compartments for emergency use, but in general light-weight interurban cars are seldom in service where the entire seating capacity is utilized. The most comfortable seats are 38 to 40 in. wide, have high backs, employ deep automobile type cushions with substantial springs, and are spaced to provide ample knee room. Experience has shown that these are essential features, and the results obtained indicate that comfort rather than cost should determine the type of seat provided. There is no excuse for crowding seats on light-weight interurban cars as occurs in some cases, since capacity loads are seldom handled for long distances and consequently a slight loss of seating capacity is immaterial.

On single-end cars which have seats that are not reversible, the desirability of facing those adjacent to the smoking compartment forward and cutting the partition to obtain foot room is questionable. Some transportation superintendents favor the use of full-size seats facing the rear of the car, thus providing accommodations for two parties of three or four passengers who may desire seats together.

Electric heat predominates on the light-weight cars because it represents less weight, is easily controlled, maintains a good interior appearance and in most cases is effective in keeping cars warm. Hot water and hot air are used on some of the cars to reduce heating costs and provide better systems for severe climates. Where stoves are used, the most satisfactory location is in a fireproof baggage compartment, and this arrangement does not increase weight if carefully designed. On cars which do not have baggage compartments the completely inclosed stove is desirable, even at an increased cost, since appearance is improved and cleanliness assured. In one case a weight reduction of 600 lb. was realized by using aluminum piping for the hot-water heating system but, of course, this increased the cost materially.

Good ventilation is essential to the comfort of passengers, and on the most successful types of light-weight cars the ventilating system has been carefully planned. Improved visibility, reductions in weight and close fitting sashes represent some of the accomplishments in window design which tend to enhance interior appearance as well as reduce construction costs. A single window with metal sash is being tried on some cars and seems very satisfactory. A number of the light-weight equipments have lighting systems that show how an interior can be improved by a definite plan to obtain effective illumination with attractive fixtures.

Other features which assist materially in providing the most satisfactory equipments are commodious baggage and coat racks, linoleum-covered floors, large saloons, elimination of vibration and noise from doors, partitions, trolley bases, ventilators, and other parts, installation of match scratchers and ticket holders, application of aluminum for baggage racks, coat hooks, seat handles and seat strips, absence of all unnecessary overhead rods and cords and good interior finish.

Gains from Light-Weight Cars

The light-weight cars on the properties considered represent applications which involve the retirement of equipment weighing 30 to 200 per cent more than the new types. Old obsolete motors have been replaced by modern efficient machines that operate economically with low maintenance. In fact, every effort has been made to reduce operating costs with due consideration to the proper balance between service, comfort and economy.

Schedule speeds have been maintained or improved in most cases. In one or two instances the possibilities of high-speed service were not fully considered previous to the selection of equipment, and operation is handicapped by low car speeds. On one property quadruple 35-hp. motors are applied on 39,500-lb. cars, and the result is low speed cars which do not meet the service requirements satisfactorily. A better equipment in this case would be quadruple 40-hp. motors, suitable for high-speed operation.

The principal operating economies that are realized by light-weight car operation occur in maintenance of way and structures, maintenance of equipment, power and conducting transportation. Way and structure maintenance is directly affected by reductions in car weights, but it is difficult to estimate the credit due light-weight equipment or to determine the saving from actual operating costs without a long period of light-weight car operation.

Maintenance of equipment is indirectly affected by car weights in that the cost of repair parts are less, but the principal savings may be ascribed to the modern designs of car bodies, trucks, motors and control. Weight reductions affect energy consumption directly, and consequently power costs are lower when lighter cars are placed in service. A saving in the conducting transportation account occurs when it is practicable to operate cars with one man and thus reduce the platform labor cost. Fifty per cent of the 38 interurban properties considered operate their new light-weight cars with one man.

A Southern property which is operating new 25,200-lb. one-man cars instead of the cars weighing 65,000 to 70,000 lb. formerly used is saving 49 per cent in the cost of maintenance of equipment, 50 per cent in the cost of power and 46 per cent in the cost of platform labor. Bus competition which developed while the old cars were operating has been entirely eliminated by the improved service, and an operating deficit has been changed to an attractive profit.

A Mid-Western property which has installed a number of 51,000-lb. two-man cars in place of cars weighing 76,000 to 80,000 lb. has reduced its cost of operation from 48 to 34 cents per car mile, a saving of 29 per cent.

Factors for Consideration

A summary of the study of the various installations of light-weight cars indicates that there are several essential factors which must receive careful consideration to obtain the most satisfactory equipment:

1. The type of car must be suitable to perform the service requirements of the particular line or system on which it is to operate. The primary factors to be considered are schedules, character of traffic, and possibilities of one-man operation. Comparisons can be made with similar properties operating light-weight cars to assist in the selection.

2. A motor equipment is required with ample speed and capacity and also capable of meeting probable increases in schedule speeds after the new equipment is installed. Possible operation in trains to handle heavy traffic must be considered in determining the type of control equipment.

3. A careful study is necessary of all details of the design, particularly in connection with the car body so that every feature which influences the comfort and convenience of passengers will be included. The most successful types of light-weight cars now in service demonstrate the effectiveness of work of this kind on the part of operators.

Southwestern Association Meets at Houston May 5-8

THE convention of the Southwestern Public Service Association will be held at Houston, Tex., May 5-8.

This is a change from May 19-22, the dates which were formerly announced. Headquarters will be at the Rice Hotel, and reservations will be handled by the hotel management. W. E. Wood, Houston Electric Company, is chairman of the general convention committee.

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American Association News

Mr. Shannahan Sees the Industry Healthy

A. E. R. A. President in Statement to the Press Reviews Progress of the Past Year—Traffic Trend Is Upward—Co-ordination of Electric Lines and Buses Encouraging

SINCE early last fall the traffic trend on electric railways has been definitely upward and the total business for the year will almost duplicate that of 1923, which set records for all time. This is the gist of the annual statement of J. N. Shannahan, president of the American Electric Railway Association, which was released to the daily newspapers Jan. 22. A banner year is predicted for 1925. The statement follows virtually in full:

STATEMENT OF PRESIDENT SHANNAHAN

Electric railways generally throughout the United States held their own during 1924. In the face of severe industrial depression early in the year, which in some communities decreased traffic 10 per cent, and an increase of 2,065,590 pleasure automobiles the record is remarkable. Final figures for the year indicate total passengers carried will be within 2 per cent of the 16,000,000,000 total for 1923, which set an all-time record.

City lines are recovering passenger business more steadily than interurbans. Substantial progress is being made, however, by many interurbans through freight business. Others are finding introduction of extra chair and dining car service and special excursion rates helpful.

The foregoing reflects only the general trend. There are both city and interurban properties, of course, which are experiencing extreme difficulties.

Today the traffic trend on electric railways is upward, as, indeed, it has been since early last fall, and indications for a banner year during 1925 are good. This because the electric railway curve invariably follows the general business trend, and it is agreed that unless the unforeseen happens business in all lines will be good.

Perhaps the most encouraging feature of the electric railway business today is the gradual but definite co-ordination of electric lines and buses. Very steadily electric railway managements throughout the country are assuming control of all local transportation, including both rail and motor lines, and co-ordinating it under one head. At the beginning of 1924 only 100 electric railway companies were operating a total of 1,000 buses in conjunction with their rail lines, but today there are 2,500 buses, owned by 170 different electric railway companies, in the field.

The bus is fitting into two distinct places. The first is in the extension of passenger service into suburban territories whose traffic does not warrant the extension of rail lines. The second is in supplementing established rail service.

These are the two logical fields for the bus, and all far-seeing transportation men realize it. The cry that the bus was about to supplant electric lines generally no longer is raised seriously by any one thoroughly familiar with the experiences of American and European cities. Of course the bus has replaced a few car lines in smaller communities—lines many of which probably never should have been built—but nowhere have they succeeded in supplying entire cities of any size with complete transportation.

Far-seeing electric railway executives everywhere are supplementing their rail service with buses where traffic warrants such action and enlightened public officials and citizens are co-operating with them in an endeavor to establish the best possible car-bus services. Under this new understanding the wildcat bus and jitney is rapidly disappearing through local and state legislation.

The pleasure automobile today is a far more serious competitor of electric railways than buses. How far they will go in competing against established transportation lines through giving "free lifts" at the risk of imperiling service remains to be seen.

ELECTRIC RAILWAYS NOW ON A SOUND BASIS

Underlying conditions with the electric lines are sound, as evidenced by the way the industry withstood the serious depression of the early part of the year. Although many industrial plants throughout the country either were closed down completely or in part, thus cutting into the regular car riders represented among office and factory workers, the operating ratio on the lines remained good. An increase of only two points, from 73.75 to 75.75, is shown. An increase of only 1 per cent is shown in operating costs, although wages alone were up 2 per cent. There were 65 wage increases, 13 decreases and 60 renewals without change.

Fares also increased during the year and exhibited a responsiveness to operating conditions, indicating anew that the old fixed fare idea has been eliminated. The average cash fare in cities of 25,000 population and over increased from 7.31 in January, 1924, to 7.49 in January, 1925, or about 2½ per cent. The January, 1925, figure represents a new peak in electric railway figures, the highest previous point in the average cash fare being 7.46, reached in November, 1921.

Another evidence of the healthy condition of the industry is the record of receiverships. Despite the fact that business depression and subnormal traffic conditions prevailed throughout the greater part of the year, only 13 street railways went into the hands of receivers, representing 1,022 miles of track and with outstanding securities of $75,000,000. Twenty-two companies, representing 1,650 miles of track and $176,000,000 of securities, were discharged from their financial difficulties.

A total of 312 miles of new track was constructed in 1924, being the largest single year's construction since 1918, and 712 miles of track was reconstructed. Total bus-mile extensions amounted to 2,870 miles, making an increase of more than 3,000 miles of service added by the electric railway companies during the year.

Abandonments amounted to 225 miles. No single abandonment, however, amounted to more than 29 miles, and the average for the 23 companies affected was slightly less than 10 miles each.

A survey made by the ELECTRIC RAILWAY JOURNAL indicates that $342,000,000 will be spent in 1925 by electric railways for new plant and equipment, maintenance, material and supplies. This total represents an increase of 30 per cent over the amount spent for similar purposes in 1924. A total of $75,700,000 will be spent for way and structures, $103,400,000 for rolling stock and equipment and $32,400,000 for power facilities. The balance will go for material, supplies and maintenance. These expenditures are exclusive of labor costs.

Wood Preservation

A MEETING of the committee on wood preservation of the Engineering Association was held at Association Headquarters, New York, on Jan. 20. Those present were A. P. Way, chairman; M. J. Curtin, J. L. Fritsch, W. L. Harwood, C. A. Smith, L. P. Scanlan and R. C. Cram, sponsor.

The work of the committee for the ensuing year was laid out. The assignments of the various sub-committees and their membership follow, the first name in each case being that of the chairman:

1. Review of existing standards. Messrs. Fulweiler, Hartman and Woods.

2. Open tank treatment of wood poles. Messrs. Fritsch, Hartman, Harwood, Morier and Scanlan.

3. Brush treatment of wood poles. Messrs. Hartman, Harwood, Smith and Woods.

4. Pressure treatment for wood poles. Messrs. Curtin, Fritsch, Woods and Scanlan.

5. Increasing life by methods other than the use of timber preservatives. Messrs. Harwood, Fritsch, Hartman and Scanlan.

6. Use of other preservatives than creosote. Messrs. Smith, Curtin, Fulweiler and Morier.

7. Forms and methods for keeping continuous records on performance of treated timber. Messrs. Morier, Curtin, Fulweiler and Smith.

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Maintenance of Equipment

Motorized Equipment Reduces Track Maintenance Costs

Welders and Compressors Mounted on Rebuilt Ford Trucks Are Readily Moved Between Jobs—Rubber-Tired Mounting Reduces the Repairs to Apparatus

FOR the purpose of increasing the mobility of track equipment and at the same time reducing its maintenance cost the Denver Tramway has adopted the practice of mounting such apparatus on 1-ton Ford trucks. Each of these units is self-contained and no trailers are hauled. The equipment is run into the shop at night, where it is under cover and easily fixed when repairs are necessary.

It has been found possible to buy second-hand Ford trucks in fairly good shape at exceptionally low prices. With very little overhauling these trucks are put into condition which makes them suitable for track maintenance work. The average price of trucks thus purchased was approximately $85.

The welding truck, shown in an accompanying illustration, is a good example of this type of equipment. It carries a crew of three men and has two welding heads. A light body is used to house the equipment, having substantial corner posts and a permanent top. Rolled curtains on the sides protect the equipment in inclement weather. The welding cables are carried on reels mounted under the top, so that they readily may be paid out to considerable distances on the track. Signs directing traffic and warning passers-by to avoid watching the arc, as well as shields to set up around the actual welding work, are carried in convenient racks built over the running board at one side of the body. On the opposite side a pair of brackets is arranged to carry the poles for connecting the welder to the trolley.

This equipment is used for welding bonds and also for building up cupped joints. On the latter class of work an Atlas grinder is used to smooth off the surface of the rail after welding.

Formerly six men were required in a repair crew because ordinarily one grinder can do the work after two welders. By using two heads on this welding equipment as mounted in the truck, four men do the work formerly requiring six. This crew consists of one grinder, two welders and one common helper. The grinder is hauled out with the welding truck, thus making the most efficient use of the equipment.

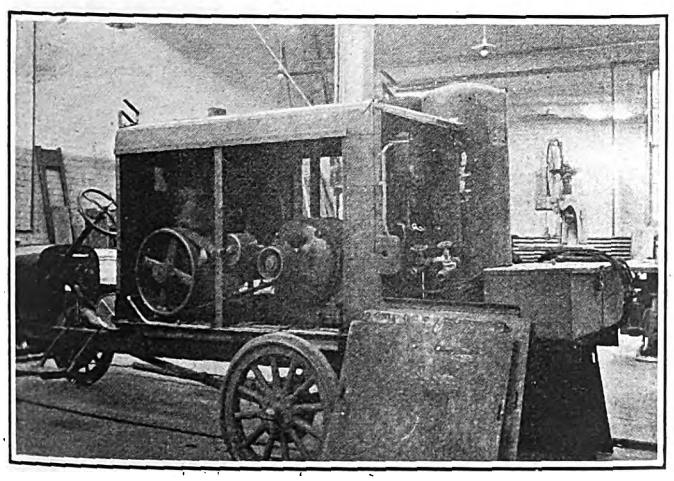
A similar piece of track maintenance equipment mounted on a Ford truck is shown in a second illustration. This consists of an Ingersoll-Rand type 14 compressor, which has sufficient capacity to handle four tie tampers or four concrete breakers at one time. In joint repair or similar maintenance work it has been found extremely convenient and, like the welding equipment, its mobility is a decided advantage.

As shown in the illustration, the body for this compressor truck is provided with removable metal sides so that when set up in operation these sides may be removed to expose the compressor for oiling or other operating attention. The compressor is motor driven from the trolley. Compressed air tanks are mounted vertically near the back of the body, and a circuit breaker for protection of the motor is installed in a small control cabinet at one side of the tank. A large tool box is mounted on an extension of the chassis at the rear.

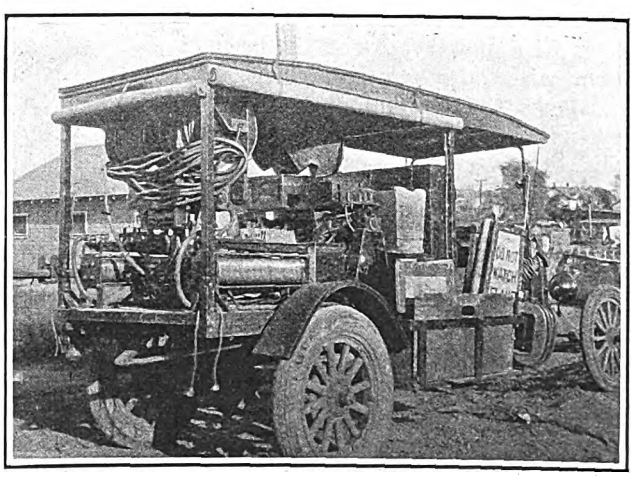
For concrete repair work, a portable boiler is used to furnish warm water. This is required for a large part of the work in Denver, since the nights are cold. The boiler is mounted on a trailer so that it may be hauled out to the job behind one of the Ford trucks just described.

Railway Builds Heavy Tower Truck

TO TAKE care of heavy overhead construction work the Middlesex & Boston Street Railway, Newtonville, Mass., purchased a 2-ton White truck and built a body and tower on this



A Motor-Driven Compressor Mounted on a Ford Truck Chassis Will Handle Four Tie Tampers or Concrete Breakers



A Crew of Four Men with This Portable Welding Outfit Can Do the Work of Six

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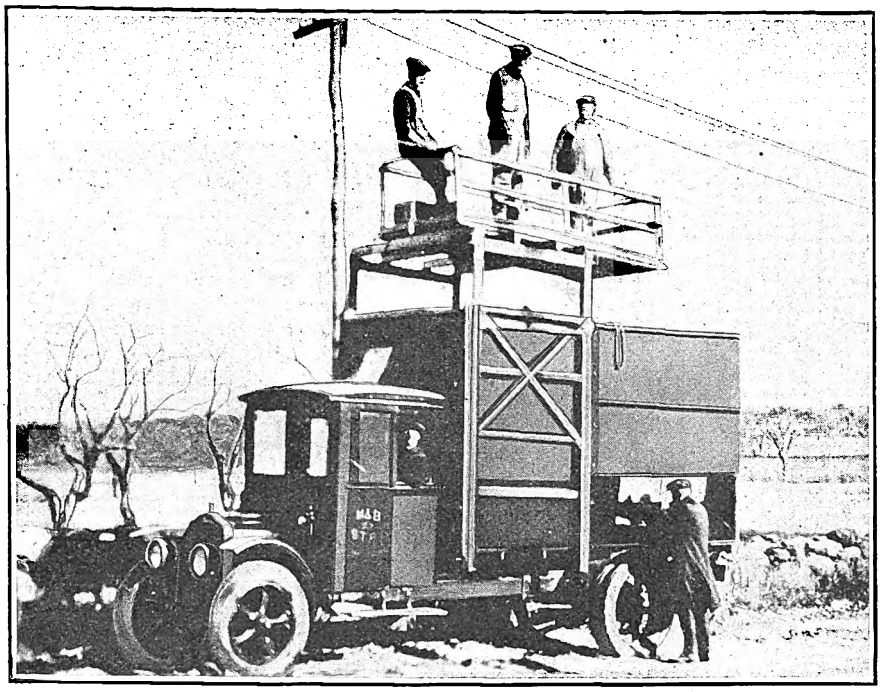


A Permanently Inclosed Body Is a Feature of This Heavy Tower Truck

chassis. The work was done at the Waltham shops of the railway. The body is of oak, while the sheathing on the sides and top is pine covered with canvas. This tower truck is similar in general design to one built some time ago by the same company, and described in ELECTRIC RAILWAY JOURNAL for Aug. 12. The new vehicle, however, is heavier and better adapted for doing work where extensive reconstruction of the overhead is involved. The crew consists of six men, a foreman, a driver, and four linemen.

Poles Set with A-Frame Derrick

AN A-FRAME derrick attached to an extension of the truck frame of a standard tower truck for setting iron and wooden poles has been used during the past 4 years by the Omaha & Council Bluffs Street Railway, Omaha, Neb. A 2½-ton Gary truck with power take-off is used. When raised, the sheave is about 15 ft. above the ground. Power is transmitted through a set of gearing with three speeds ahead and one reverse. This transmission drives a 5,000-lb. Bay City winch, which is located back of the tower. A length of 600 ft. of ½-in. hoisting cable is used for the winch. The cable is carried from the winch up over the sheave on the A-frame and then to the pole to be raised. One man operates the control levers and another steers the pole into the hole. When not in use, this A-frame is removed from the truck by taking out two bolts. When 35-ft. poles are to be set, an additional 5-ft. piece is added between the truck and the bottom of the short A-frame.

With this addition to the company's standard line truck, the cost of setting poles has been cut to half and the cost for removing iron poles to about one-fourth of the former cost where a gin pole was used. An additional saving has also resulted when removing iron poles by lifting out the concrete base intact without loosening it from the iron pole. The pole is then ready to be set in another location without much work. The poles to be set are hauled on a 2½-ton trailer behind the line truck. The trailer is uncoupled when the job is reached.

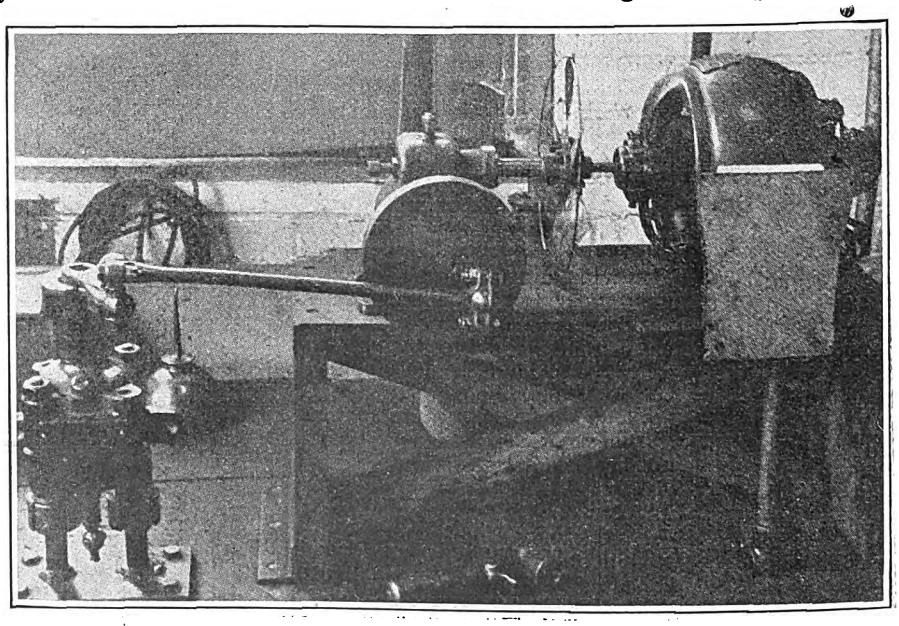
Motorman's Valve Worked In by Machine

BY O. R. HOTT
Columbus Railway, Power & Light Company, Columbus, Ohio

A MOTORMAN often complains that a recently overhauled air valve works hard, due to the newness of the seat and the close fit of the valve stem. To work in new valves an apparatus is used in the car repair shops of the Columbus Railway, Power & Light Company. This operation duplicates the wearing-in process which would require several days actual use by a motorman.

As shown in the illustration, a ¼-hp., 500-volt d.c. motor drives, through worm gearing, a crank which in turn operates the valve. After the valve has been lapped in by hand, it is assembled on a valve support on the bench and connected to the shop air line in the same manner as on the car. The special motorman's valve handle used has a connecting rod, the other end of which is fastened to a crank pin of the propelling mechanism. Both ends of the connecting rod have ball and socket joints. The stroke of the connecting rod is such that the valve is oscillated back and forth 120 times per minute through the usual operating arc. Working in a valve takes from 15 to 30 minutes, depending upon its tightness at the start.

This entire outfit was made in the shops from materials at hand. The reduction gearing and crank were designed and built in the shop, while the connecting rod is a portion of a



An Apparatus Which Gives the Motorman's Valve the Proper Freedom of Movement Before It Leaves the Shop

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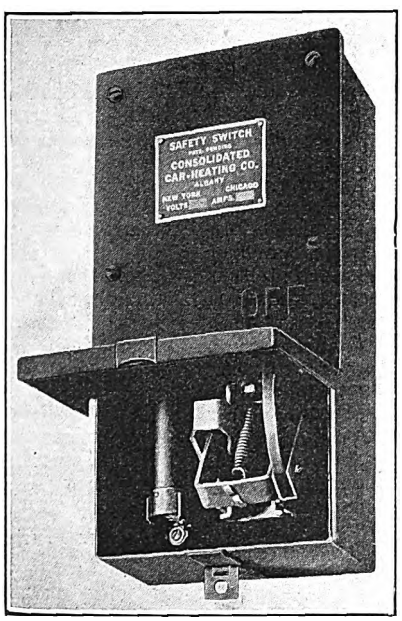
Ford automobile steering gear. Since this mechanism has been used motormen have experienced no trouble from sticking valves.

New Equipment Available

Safety Switch

SEVERAL improvements have been made in a design of safety switch manufactured by the Consolidated Car Heating Company, Albany, N. Y. The switch box is arranged to contain the fuse for car heater circuits. By opening the cover the switch is automatically opened so that there is no danger of a person touching live parts while replacing a fuse. The switch is mounted in a steel box 6 in. x 12 in. x 4 in. deep. The lower part of the cover is hinged so as to provide for replacement of fuses. For ordinary operations of opening and closing the switch an arm projects through the cover and the two positions are lettered so as to indicate "On" and "Off." Opening the cover automatically shifts the handle to the off position, so that a fuse cannot be removed with current on.



Safety Switch for Car Heater Circuits. The Cover Is Shown Raised to Permit Fuse Replacement

Improvements in construction include contacts mounted in molded insulation and an arc chute with blow-out coil. The contact tips can be replaced and screws can be taken out from the front.

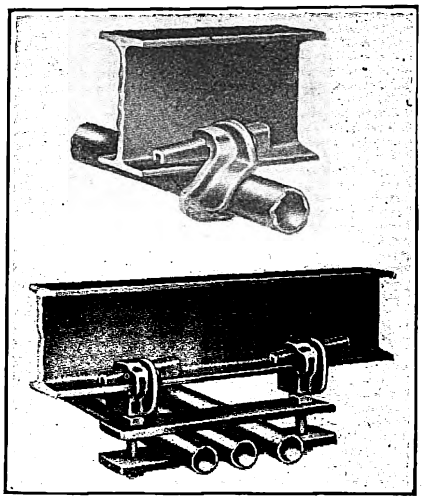
Copper Bearing Steel Poles

OF THE substitutes for wood poles which have been tried, those made of steel have many advantages and no doubt would have superseded wood but for their high first cost, when compared with wood, and lack of dependability due to danger of damage by corrosion. Up to the present, galvanizing has been the only method tried to prevent corrosion, but this adds greatly to the cost. Recently the Truscon Steel Company, Youngstown, Ohio, put on the market a steel pole fabricated from copper-bearing steel which contains new features in design tending greatly to reduce manufacturing costs.

The mechanical construction of the pole was described in the June 21, 1924, issue of ELECTRIC RAILWAY JOURNAL. It consists of two structural steel channels, each with the center portion of the web sheared and pressed out normal to the web. The pressed out sections have a triangular shape and when riveted together a latticed tapered pole is formed.

Hangers for Clamping Pipes to Framework

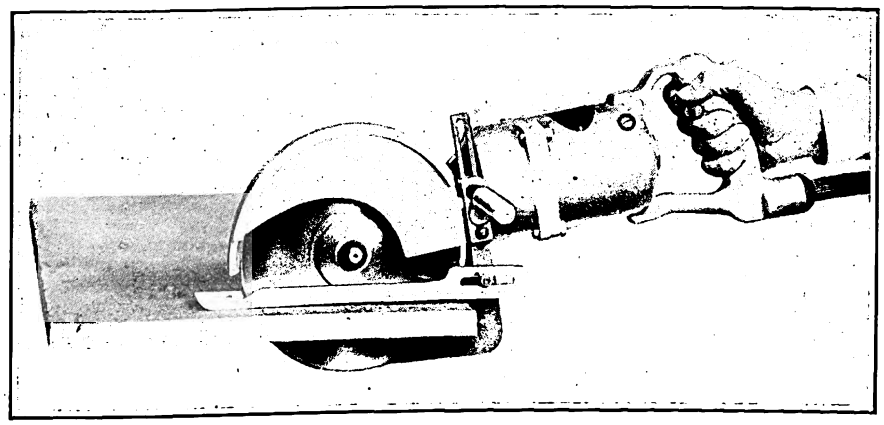
A LINE of pipe hangers for clamping conduit or pipe to structural shapes is being marketed under the trade name of "Wedgtipe" by the Crouse-Hinds Company, Syracuse, N. Y. These pipe hangers allow pipe or conduit to be clamped to supporting members where the flange is not less than $\frac{1}{8}$ in. at the edge and not more than $\frac{3}{8}$ in. thick at a distance $\frac{3}{4}$ in. from the edge. They are particularly convenient for fastening conduit to the underframing of car bodies. Each hanger consists of two pieces, a hook and a wedge. The hook fastens underneath the pipe or conduit and the wedge provides the clamping action when driven into place. The wedge has serrated surfaces at both top and bottom, so that when driven into position, there is no danger of its working loose through vibration.



New Hangers Used to Clamp Single Pipe to I-Beam and Also Several Pipes by Means of Cleats

Electric Circular Saw

A PORTABLE type circular saw which is electrically driven is being marketed by the Michel Electric Hand Saw Company, Chicago, Ill., under the trade name of "Skilsaw." This can be used for cutting lumber up to 2 in. thickness. By means of a special cutter furnished with the saw other building materials can be cut. The body of the saw is made of No. 12 sheet aluminum, so as to keep down the weight of the tool. The electric motor for driving the saw is of the universal type and can be furnished in sizes for use on either 110 or 220 volts, a.c. or d.c. The motor is air cooled by forced ventilation. The control is by a contact trigger switch on which the operator's finger must be held to keep the motor running.



Cutting a Board with the Portable Electric Circular Saw

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The News of the Industry

Chicago Bankers Insistent

If Municipalization Scheme Is to Go Through, Security Holders Must Be Accorded Protection

A new tone of militancy has entered the Chicago traction negotiations. With all parties in the municipalization program holding in steam nearly to the bursting point, something like an explosion seemed imminent. The tenseness was created by the statement of Silas Strawn, attorney for the bankers holding Chicago Surface Lines securities, that the city could not get control of the lines until the last cent had been paid. An election in February impends.

"Do you mean to say that when we have paid in 90 per cent we will still have 30 per cent control?" shouted an Alderman when Mr. Strawn made known the bankers' insistence on those terms.

"Not if you had anything but stage money to pay us," retorted Mr. Strawn ironically.

"We won't stand for it," broke in Chairman U. S. Schwartz, who conducts most of the city's negotiations. "We'll kill the whole deal."

This was only one of several stormy incidents, but it was the major development of the negotiations of the city of Chicago to create a city-owned transportation system to cost upward of $500,000,000. The upshot was that Mayor Dever backed up Mr. Schwartz and issued a veiled threat to the Surface Lines securities holders.

"The bankers are mistaken if they think the city powerless," said the Mayor. "And if they think that because we are on top of the elections we haven't another program for just this contingency, they are due for some information.

"They can take this as an ultimatum: co-operate or we will step out with another plan at once. The air has been cleared and I am not discouraged. If they want a settlement they can have it, but they will have to come to us now."

The contested section is one providing for tripartite control of the lines until the city pays off all the so-called Schwartz certificates, which are the notes to which Mr. Strawn referred as "stage money." The city will have outright dictation over three of the nine members of the operating board and it has been the intention of Mayor Dever's advisers to have him take over the appointment of additional members in proportion to the amount of indebtedness paid off.

Committee members then asked Mr. Strawn to try another plan on the bankers.

"I am not smart enough to devise a substitute," he said in reply. "The bankers feel that their obligation to the last certificate holder is as great as to the first one paid off. They will not recede."

A poll of the committee on the question of acquisition of control in proportion to retirement of the city's notes brought a dissent from Alderman Guy Guernsey, one of the foremost members of Council. Pressed for a reason, he retorted:

"I care too much for this plant to let a Council run it. I am concerned about our transportation not so much during the period of payment while private traction men have control as for the ten years that follow."

Alderman Fick, calling the traction plan a 50-year franchise for the Surface Lines, recalled the day when he entered the chamber to vote on a Yerkes 50-year franchise.

"Nooses dangled from the gallery and there were bombs on the floor," he said. "The franchise got 12 or 13 votes."

Divided Report on Boston Elevated

Wide Conflict of Opinion Among Members of Special Legislative Committee—Bare Majority Seeks Delay—Minority Would Extend Public Control Twenty Years—Battle in the Legislature Expected

TWO separate and distinct reports were filed on Jan. 17 with the Legislature of Massachusetts by the joint special committee of that body created to investigate the question of control, finances and equipment of the Boston Elevated Railway and to consider and report on the advisability of establishing a transportation district for the financing of metropolitan rapid transit. The membership is widely divided on questions of policy and in its conclusions. There is a majority report signed by five out of the nine members, headed by House Chairman Henry L. Shattuck, and a minority report signed by four other members, headed by Senate Chairman Charles C. Warren.

At the outset of the committee's investigation the public trustees of the Elevated presented a statement of capital needs calling for an expenditure of approximately $20,000,000 in the next 10 years, at the same time calling attention to the company's inability to provide the necessary capital without Legislative aid.

The majority in their conclusions state that the several questions presented in the order creating the committee are so interrelated that new capital should wait upon a further study of the termination or extension of public control, complete public ownership and the question of the creation of a transportation district. The majority state that while they are aware that many of the improvements which the Elevated desires are desirable and should be made in the near future, raising new capital for the purpose of making these improvements is so involved with the other questions that further study should be made of the whole problem; and a resolve is submitted providing for a further investigation.

The minority are in accord with the majority in its recommendation for a further study of the formation of a metropolitan transportation district, but is opposed to the remainder of the conclusions and recommends that the present General Court extend public control for 20 years. An extension of public control for this period, they believe, will be ample to allow the Elevated to finance itself. They take the position that the road must not be hampered nor obstructed in its progress and operation. New capital is needed and should be provided without delay. The greatest obstacle in the way of the company's obtaining new capital is the uncertainty as to the future, and the minority recommend the 20-year extension, confidently believing that it will furnish the necessary relief. They also present a bill providing for an extension of public control for the period mentioned.

In brief, the majority committee has concluded that there are a number of desirable improvements for which capital should be available within the not remote future. The method by which such needed capital is to be raised, if a far-sighted plan is to be adopted, involves at one and the same time the questions of termination, modification or extension of public control, of complete public ownership or further steps toward public ownership, and of the creation of a transportation district.

These questions, the majority committee says, are interrelated and inseparable. They involve problems of great complexity and of the highest statecraft. No decision concerning public control should be made without the fullest examination, from every angle, of complete public ownership and of further steps toward public ownership; and no decision on either public control or public ownership should be made without the most careful consideration of the need for a transportation district and of the powers, duties and political structure and control of such district if created. The committee believes that it would be most unwise to attempt to pass on any one of the questions without the fullest study and

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consideration of all. The majority of the committee said in part:

If the fixed term of public control is extended, various amendments to the public control act should be made, and if a transportation district is established to take over the control of the Elevated system and provide for the ownership, construction and financing of rapid transit lines, the public control act must be so revised as to make it fit the district plan. In carrying out any such changes, and in the financing of any capital expenditures which may be required, the stockholders of the Elevated should give their hearty cooperation.

No plans for raising capital in any considerable amount on satisfactory terms pending further study of these questions as a whole have been suggested to the committee except such as might greatly hamper, if not hamstring, a wise, long-range solution of these questions. The committee, therefore, looks with disfavor on the adoption of any palliative which in no way strikes at the root of the difficulty.

The proposal that the fixed term of public control be extended for 20 years, if adopted, would give no assurance that new capital could be raised through the sale of Elevated stock.

PUBLIC CONTROL CONTINUES

The principal advantage, so far as the public is concerned, of extending the fixed term of public control beyond 1928 is to enable the company to raise new capital at reasonable rates.

If this object is not attained, the principal argument for an extension of the fixed term fails. Before making any extension of this fixed term we should be very sure that such extension will make possible the accomplishment of this object. As previously stated, there is no such assurance.

Furthermore, if the 20-year extension were granted and the question of establishing a metropolitan transportation district were postponed, it might be much more difficult, if not impossible, to obtain the required assent of the Elevated stockholders to such changes in the public control act as might prove advisable in connection with the establishment of the district.

Another objection to rushing into any extension of public control is that certain plans have been submitted to the committee for financing capital needs without any extension of public control. These plans should be further studied before any final commitment is made on this question.

RECOMMENDS FURTHER STUDY

For the reasons stated above, the only recommendation which the committee makes at this time is that these questions of public control, public ownership and transportation district be further studied.

The committee believes that no vital public needs will be imperiled by the delay caused by further study.

More important at the moment than new capital is the balancing of the budget. That must come before any considerable capital expenditure can be thought of.

As previously pointed out, there has been a great change since July, 1923. Then receipts were running at the rate of more than $1,000,000 a year above expenses, and the margin of receipts over expenditures was increasing.

In October, 1923, came a wage award which increased annual expenses by about $1,800,000, and the year ended June 30, 1924, closed with an operating deficit of $144,202, which was wiped out only by a fortunate settlement of old claims. Since then every month from July to October has shown a deficit, and in October, 1924, came another wage award, increasing the annual wage expense by about $500,000 more.

Following this, the 5-cent fare went by the board. No one knows now whether fares must be increased to meet expenses. No one knows whether wages will be lower or higher this year. Much depends upon the wage settlement to be made for the year beginning July 1, 1925. The committee repeats that the question of revenue and expense is the question of the hour. Further capital expenditures must and can wait.

The minority of the committee agrees with the majority in its recommendation for a further study of the formation of a transportation district, but opposes the remainder of the conclusions. It undertakes as briefly as possible to set out its reasons why it believes it is necessary that the questions of continuance or discontinuance of public control, the needs of the road for additions and improvements, and the financing of the same, are subjects that should be presented to this session of the General Court for discussion and debate, and an opportunity be then given to remove the uncertainty that surrounds the future of the company. The minority report said in part:

When the trustees came before the committee at the first public hearing and presented a statement of their requirements, they filed with it a schedule of plant improvements, the construction of which was to cover a period of 10 years and was estimated to cost $20,000,000.

Whether every item listed in said schedule is imperative we do not undertake to say, but from our investigation of the plant made by visiting and examining places where improvements were contemplated, it was obvious that many are needed, and that some should be made in the near future in the interest of economy of operation.

The law puts restrictions on the sale of Elevated stock. It does not allow the issue of that stock at less than par, and the common stock of the company, under present conditions, has lately been selling in the market around 76 and the 7 per cent preferred at 94, so it is clear that raising capital by this method is out of the question. It does not seem advisable for the trustees to issue stock bearing 8 per cent dividends, as they have authority to do, as this would place an unfair burden on the car rider.

Under the present law the trustees may issue notes that are made payable not more than 12 months from date of issue, but special legislation would be necessary to enable them to issue notes for a longer period. The trustees have already borrowed on short time notes the sum of $5,200,000, and believe they have approached the limit with notes of this character; to borrow further on short-time securities would, in their opinion, seriously affect the general credit of the company. As obtaining capital by the sale of stock is impossible, and an issue of bonds or short-time notes inadvisable, how, then, are the trustees to get capital to the amount recommended?

PUBLIC CONTROL A SUCCESS

Public control has been in operation sufficiently long to impress the public with its practical success. Those who appeared and spoke at the public hearings of the committee were practically unanimous in recommending a continuance of public management. All were agreed that the affairs of the road had been administered by the public trustees in an economical and business-like manner. Its efficiency has been restored, and satisfaction with the service rendered prevails to a greater extent today than for some time past.

With the possible end of public control so near and that fact well known and recognized, uncertainty prevails. This is having a marked effect upon the development and expansion of the company. The price of the common stock on the market is a strong reminder of the present situation and a true indication of how uncertainty will affect the standing of a large corporation.

The trustees are fully alive to this state of affairs and have convinced us of the necessity of removing as soon as possible this state of doubt, so that the credit of the company will not continue to be adversely affected.

We, therefore, recommend that the act be extended for a further period of 20 years, together with amendments that are advisable, and submit an act. We believe an extension for that period will provide such assurance as to the future of the road as will enable it to finance itself. Such an extension will also afford reasonable permanency and permit broad plans for development over a period of years.

We further point out in support of our position that the trustees have already been delayed over one session of the Legislature, having first presented their needs at the session of 1924, and if they are now compelled to wait further study and a report upon all the questions in the order, any action in their behalf will be delayed until the session of 1926.

It is not at all clear that if the formation of a transportation district is further studied and recommended that it will ever be established. It may appear that the towns and cities adjacent to Boston are not yet ready to become united in a plan of this kind. The fact that a metropolitan transportation district may be established at some future time does not justify delaying action as to the extension of public control. In any event, with the future so uncertain as to a district and the needs of the Elevated so apparent, further delay would be a mistake. The public control act directs the trustees to maintain the property "in good operating condition and to make such provision for depreciation, obsolescence and rehabilitation that upon the expiration of the period of public management and operation the property shall be in good operating condition.

We therefore reiterate that improvements should be permitted and capital provided, and that this Legislature at the present session should extend such assistance to the road as will enable the trustees to maintain the railway in such operating condition that it can render efficient service to the public at a minimum cost.

Injunction to Stop New York City's Bus Program

The Board of Estimate of New York on Jan. 19 appropriated $135,000 for buses with which to equip a city-operated line on Eighty-sixth Street. Twenty buses were to be purchased. Commissoner Mills of the Department of Plant and Structures anticipated a profit of $100,000 a year. The line was to be established on the assumption that Comptroller Craig is right in saying that the city has power to operate buses under the home rule amendment passed by the Legislature at its last session. This assumption was challenged a few hours after the appropriation had been made by Leonard M. Wallstein, acting for the Citizens' Union. He secured a temporary injunction against the disbursement of the $135,000. It has been Mayor Hylan's contention that additional legislation was needed for the city to enter upon its own bus program, but Mr. Craig has stuck stoutly to the contention that the city already had powers sufficient to permit it to proceed. The Mayor finally capitulated.

Dallas in Throes of Fare Difficulties

The City Commission of Dallas, Tex., recently granted the Dallas Railway a second extension of the 6-cent fare for 30 days ending Feb. 10. The first extension was granted Dec. 27 for 15 days. In line with the 6-cent fare extension the company will be expected to carry out improvements suggested in the amended Everman Plan No. 3, soon to be drafted by the city attorney. The plan provides for $243,000 in betterments to the system in return for being permitted to charge a 6-cent fare for another 18 months. The amendment includes the rebuilding of 25 cars. At the same time Supervisor Everman has left the way open to negotiations eventually to remove the time limit on the 6-cent fare.

A spokesman for the City Commission explained that this would be done by an alteration in the phraseology in the ordinance giving legal effect to Everman Plan No. 3. It reads: "At the conclusion of 18 months the fare will automatically revert to 5 cents." The alteration will be to this effect: "At the conclusion of 18 months the fare will continue at 6 cents unless otherwise ordered by the City Commission."

It was said that this proposed change would place the Dallas Railway in position to borrow or float bonds to the sum of $1,000,000 of new money to be placed in the properties.

This development, however, can not take place unless the State Supreme

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Court at Austin decides the Geller suit favorably toward the traction company and the city. This suit, filed by F. J. Geller of Dallas, questions the right of the City Commission to grant a 6-cent fare when the franchises of 1917 specify 5 cents. Until this suit is adjudged, the traction company is not in a position to borrow money, officials testified at the public hearings.

Under the terms of the franchises when the reserves are refilled, the $900,000 of improvements made in the past under Everman Plans Nos. 1 and 2 will be added to the property value of the company. At present the company is permitted to earn 7 per cent on a property value of $9,500,000. With the improvements admitted to property value the company will be permitted to earn 7 per cent on $10,400,000. It was brought out in the hearings that the gross revenues of the company have remained the same for the last 3 years in spite of the improvements. It is not estimated that they will increase next year. On that basis it is feared that with more money going to pay the authorized return less money will be in the surplus for improvements.

Talk of Railway Buses at Worcester

Whether or not the Worcester Consolidated Street Railway, Worcester, Mass., operates buses in the near future is reported to depend largely upon what the 1925 Massachusetts Legislature does regarding the enactment of laws intended to control the use of these vehicles. Officials of the railway are said to believe that in some of the outlying sections which the railway covers the buses could be operated more economically than trolley cars. The present laws do not cover certain points regarding transportation by bus which the Consolidated officials want to see cleared up before they consider the operation of buses.

Charter Sought for Subsidiary Bus Company in Pittsburgh

Application has been made for a charter for the Pittsburgh Motor Coach Company, which will be affiliated with the Pittsburgh Railways, or more properly the Philadelphia Company. The proposed incorporation of the new company is regarded as the first steps toward establishing a network of bus lines in Pittsburgh and other parts of Allegheny County.

In the charter application, two proposed routes are specified. One of the routes proposed is the so-called Squirrel Hill route, along the Boulevard of the Allies, through Squirrel Hill and to Thomas boulevard in Homewood. The other is the route from Butler and Fortieth Streets across the Washington Crossing bridge to Millvale.

After the initial routes are established, the present plans include the gradual extension of route establishments until those points in the city and suburbs not covered by street cars are furnished transportation. Activities outside of Allegheny County, in which Pittsburgh is located, are not likely to be projected for some time to come.

What Would You Do?

WEATHER like that of Friday and Saturday is enough to try the patience of most folk, and nowhere more than on the street cars can there be found evidences of the varying reaction upon the human animal of the delays and inconveniences to transit. "Rotten service" is perhaps the first and most natural verdict of the average man or woman who stands in the slush waiting for the car that does not come or, worse yet, stands in impotent rage when it runs past without stopping. And the same conclusion is often reached by the more fortunate one who, once inside the car of his choice, is compelled to stand in a space far too small and await seemingly indefinite hours while stalled automobiles and trucks are dug out of the drifts.

It is not wonderful that patience breaks under the strain, but it is peculiarly a time for philosophical endurance and for that give-and-take without which intercourse with our kind would often be intolerable. Car conductors and motormen are only human, and if they sometimes lose their tempers, if they run by when they ought to stop, if the side door is closed to waiting and shivering folk on the corners and if the trip to business or home again takes two or three times the normal period, it is unfair to put all the blame on "the service." Impolite or tactless carmen can be admonished or disciplined, but the weather we have to take as it comes. And the narrow streets and their increasing use by wheeled vehicles cannot be remedied or checked by cussing at them or at the transit company. If the fellow who damns the "rotten service" would only consider what he would do on days like Friday or Saturday to make it better, perhaps he would realize that there are limits beyond which executive management cannot hope to go and that rain and snow and ice, like time and tide, wait for no man.

Editorial from Philadelphia *Public Ledger*, Jan. 5, 1925.

Seeks Amendment of Syracuse Franchise

The New York State Railways, seeking to abandon its railway line in Grape Street and establish bus service in its place, is to ask amendment to its franchise covering the route. The move is sought by the city in an effort to relieve congestion in the downtown section of the city. The company has never before sought to replace trolleys with buses. The bus routes have all been in sections where the railway did not hold franchises. These lines are operated under special bus permits.

The company fears that if it established buses on the Grape Street line under permit the provisions of its franchise would become void. It wishes to hold the franchise for the streets traversed and at the same time operate buses.

Alabama Decision Protects Railways

The Alabama Public Service Commission has ordered a number of jitney operators at Huntsville and Gadsden, Ala., to discontinue service until they have complied with state regulations. By this ruling the state commission lays down a precedent that railway service must be protected. The commission held that jitneys are a public utility and as such are subject to the rulings of the commission. It was the opinion of the commission, however, that cities having utilities should adopt their own jitney regulations. The action of Birmingham in forbidding the use of jitneys was cited as an example of the success of city regulation.

Hopes of Service Resumption Blasted in Marietta

All hopes of an immediate resumption of railway service between Marietta and Atlanta, Ga., were blasted on Jan. 16. That day, after an agreement had been reached between the officials of the Georgia Railway & Power Company and a group of Marietta citizens that the service should be resumed Jan. 17 and the City Council of Marietta had passed an ordinance forbidding the operation of jitneys on its streets, Judge Morris of Marietta, representing a number of bus lines, filed suit in the Fulton Superior Court asking a receivership for the railway. Filing of the suit caused railway officials to abandon the agreement reached at the conference and wrecked all hopes of an immediate resumption of service.

The petition filed by Judge Morris seeks the following things:

That any and all patrons of the said road who may so desire be permitted by order of this court to intervene and be made parties to this cause.

That the defendant, its agents and employees be enjoined from at any time in the future disconnecting or dismantling any of the tracks, electric lines or other properties of the said defendant which are necessary for the operation of the road.

That a temporary receiver or receivers be appointed instantly by this honorable court, with direction and authority immediately to begin the operation of the said road as it was operated up until Jan. 14, 1925; that the defendant, its officers, agents and employees be ordered and directed to turn over and deliver to said receiver all of the physical properties of the Atlanta Northern Railway, and that the conductors, motormen, agents and other employees of the company who were engaged in the operation of said cars immediately prior to the time the defendant ceased the operation of the same be ordered and directed by this honorable court to operate the said cars under the direction of the receivers appointed by the court.

That on the final hearing of this cause the said receivership be made permanent unless the defendant, through its properly constituted officers, agree to continue the operation of the said railroad in the manner in which it was being operated prior to the time it ceased operations or until it, in the manner prescribed by the laws of the state, be duly authorized to cease the operations.

That on the final hearing of the cause the defendant, its officers, agents and employees be permanently enjoined and restrained from at any time in the future, in any manner, dismantling or disconnecting any of the physical properties of the said railroad or ceasing the operation thereof until authorized to do so in the manner prescribed by the laws of the state.

That the petitioner have such and further relief as the court may deem right and proper in the premises.

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New Co-ordination Scheme to Meet Financial Emergency

An electric railway that was profitable three months of the year and unprofitable the other nine months has turned the bus to its advantage. About 6 months ago the Newport Electric Corporation, Newport, R. I., operating the road in question, made plans to supplant the railway service nine months of the year with buses and to operate both the electric railway and the buses during the three summer months in order to take care of the peak business. In other words, the electric railway service with the shops, etc., would be closed down approximately nine months of the year or until the congestion of the highways should bring about the use of the electric railway.

In order to do this the company secured a certificate of necessity and convenience from the Public Utilities Commission of Rhode Island. Before the railway could secure delivery of its buses, however, an independent operator established service. The Newport Electric Corporation secured an injunction and stopped this service. It is now giving the service itself. The court proceedings of this case were used as a basis for similar action on the part of the New York, New Haven & Hartford Railroad and the Boston & Maine Railroad in their efforts to restrain the operation of bus services which they regard as particularly unfair. As indicated previously in the ELECTRIC RAILWAY JOURNAL preliminary injunctions restraining seven bus lines from continuing operations have been granted by Judge Chester W. Barrows in the Superior Court at Providence on petition of the United Electric Railways and the New York, New Haven & Hartford Railroad. The case of the New Haven road against the Interstate Buses Corporation has been removed to the United States District Court.

The electric railway department of the Newport Electric Corporation consists of 22.39 miles of track, using 62 cars, in the city of Newport and the towns of Middletown, Portsmouth and Tiverton, and an interurban line from Newport to Fall River, Mass.

Duplication of Service Voted Down in New York

The Public Service Commission on Jan. 5 denied the application of the Bee Line, Inc., for permission to operate a bus line from the New York City line at Rosedale to the village of Freeport. The petition was opposed by the receivers of the New York & Long Island Traction Company, who produced figures in evidence showing that during 10 days of operation of the bus line in August and September there was a considerable falling off in receipts of the railroad. The investment of the New York & Long Island Traction Company from Freeport to Jamaica Junction was testified to be at least $300,000, and the company is now in position to continue operations and effect betterments out of its income if not deprived of operating revenue. A reorganization of the company for further financing and betterments is expected to take place shortly. The commission concludes that if the road and its receivers and the reorganized company do not give proper service a new application for a bus certificate may be proper.

Boston "L" Can Discharge Citizens from Employ

Trustees of the Boston Elevated Railway, Boston, Mass., have the right to discharge employees who are citizens or World War veterans and retain noncitizens. An opinion to this effect has been rendered to the Governor of Massachusetts by Attorney-General Jay R. Benton. The question was put up to the state authorities by Leo M. Harlow, commander of the Massachusetts department of the American Legion. He declared that the Elevated, under its seniority of service rule, was laying off employees who were World War veterans and keeping men who were not citizens. In view of the fact that the Elevated is under public control, Mr. Harlow questioned the right of the trustees to deprive the World War employees of the preference right given similar employees in other branches of the public service. Mr. Benton holds that "the service in which the employees of the company are engaged is not in any branch of the public service and that the statutory provisions giving preference to citizens and veterans in the public service are not appreciable."

Carol, Sweetly Carol

Clinton D. Smith, general manager, and H. O. Allison, commercial manager of the Beaver Valley Traction Company, New Brighton, Pa., promoted the revival of the singing of carols Christmas Eve last year throughout the district of thirteen towns and townships in which the lines are operated. Obtaining the services of Prof. T. Earle Yearsley and Prof. J. Christian Ringwald, Beaver College, the carol singers, numbering 200, were rehearsed, divided into groups and assigned to districts prior to Christmas Eve. After the separate groups had visited a large number of homes where there were "shut-ins" they were assembled into one group and sang at the various hospitals and institutions. Transportation was by street car and by motor coaches, obtained from the Beaver Valley Motor Coach Company, a subsidiary of the traction company.

Recommend 112 Miles of Railway Construction in Maine

An investigating committee recently recommended to the Interstate Commerce Commission the construction of 112 miles of electric railroad in Aroostook County, Maine. The new line, which will be known as the Quebec Extension Railway, will develop Maine's timber region east of the Rocky Mountains, consisting of 1,200,000 acres of virgin timber in northern Maine. The Quebec Extension Railway is controlled by the Aroostook Valley Railroad, which has been in successful operation about 15 years. The cost of the project is estimated at $4,000,000.

Illinois Central Seeks Increase in Commutation Rates

The commutation lines of the Illinois Central Railroad, now in the midst of a $26,000,000 electrification program, and three other big railroads spreading fanwise out of the heart of Chicago have taken steps to increase commutation fares 20 per cent, effective as soon as permission can be obtained from the state. The change will affect more than 150,000 passenger trips a day.

The Illinois Central operates 402 suburban trains and carries 87,000 passengers a day. It announces a deficit of $3,824,116 in 4 years on suburban service without adding any return on property investment and says it could save $1,000 a day in running expense alone by stopping all its suburban service. The income in the 4 years was about $10,000,000.

Electrification has already cost $12,000,000. This sum includes $4,000,000 already paid out and $8,000,000 of obligations entered into in the last 60 days for equipment. With the electrification will also be completed a park project, so that the Illinois Central will run its first 8 miles virtually all through lake front parkway, lagoons, golf courses and bathing beaches.

The change in rates is expected to have a profound effect on part of the city's transportation, as all the lines have heavily populated zones in direct competition with elevated, bus and street car lines. The present Illinois Central 10-ride ticket fare to competitive stations is 11 cents a ride, the elevated 10 cents cash or three tickets for 25 cents, bus 10 cents and surface lines 7 cents. The railroad, however, makes the run in half the time. The Northwestern's 10-ride rate to competing territory is 11 to 19 cents a trip, the latter being the fare to Evanston. The road has 184 daily trains carrying 33,000 passengers. The other lines seeking the increase are the Burlington, with 185 trains daily, and the Rock Island.

Bus Legislation Suggested in Wisconsin

Agitation has been revived to tax bus lines in Wisconsin 3 per cent on their gross earnings, as a contribution to the state highway fund. It is estimated this tax would produce more than $1,000,000 annually. An effort is also expected to be made at the present session of the Legislature to bring the bus lines under the supervision of the Railroad Commission with respect to service, routes and fares.

Home Rule Agitation Renewed

Suggestions have been made in Minnesota to have the Legislature of 1925 restore to the individual cities control of street car fares and regulation. In 1923 the Legislature authorized the Railroad and Warehouse Commission to regulate fares in St. Paul, Minneapolis and Duluth. Valuation hearings proceeded throughout the 2 years with only one decision, that in the Duluth case. St. Paul and Minneapolis evidence is now in the hands of the state commission. The Duluth order was annulled by a federal court ruling.

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License Board Refuses Bus Permit to Boston & Worcester

The Worcester, Mass., license board has refused to grant the Boston & Worcester Street Railway permission to operate buses in Worcester as a part of the Boston-Worcester bus line. During the hearing it was made to appear unlikely that a satisfactory arrangement could be made with the Worcester Consolidated Street Railway for the transfer of passengers from buses to the trolleys at the city line.

The plans of the company as explained to the license board involved the operation of four 25-passenger buses on 2½-hour schedules. The proposed fare between Boston and Worcester was set at $2. Two subdivisions of the fare were contemplated, however, one a $1.25 fare to Marlboro from either terminal. Consolidated officials took the attitude that if the time had come for operation of buses it should receive the preference.

The Boston & Worcester representatives explained it wanted the buses even though it continued to maintain its Boston to Worcester trolley, to get back patrons lost to bus lines operating between the two cities.

The Boston & Albany Railroad was also placed on record against the petition. It was explained that this was not because of any feeling against the Boston & Worcester, but because the road felt there were adequate means of transportation between the two cities. The New York, New Haven & Hartford Railroad also went on record against the petition.

Mayor Michael J. O'Hara supported the stand taken by the license board.

Wants 7 Cents in Shreveport

The Shreveport Railways filed a petition with the Louisiana Public Service Commission on Jan. 14 requesting that body to permit an advance in rates from 6 to 7 cents per adult passenger. The fare for school children would remain at 2½ cents. The petition points out that the present fare of 6 cents was fixed by order of the Public Service Commission with the stipulation that certain improvements be made. These improvements were made, the petition asserts, at a cost of $210,457. It is further declared that while the company is permitted to earn 8 per cent, during the period of Jan. 1, 1924, to Oct. 31, 1924, the company earned only $17,122, whereas it should have earned $116,667. It states that bankruptcy will follow such a condition, but that a rate of 7 cents would be likely to bring a gross income of $734,355.

Illinois Traction Petitions to Handle Freight Into St. Louis

The Illinois Traction System has asked the city of St. Louis, Mo., for permission to handle carload freight into the city in order to supply many of the industries along its lines with coal and to haul carload business. At present the road is permitted to carry only passengers, mail and wrapped bundle freight. A hearing on the application for an amendment of its franchise ordinance was held by the public utilities committee of the Board of Aldermen on Jan. 14. The Aldermen decided to hold a general public hearing on the matter on Jan. 29. A similar bill has been advocated several times in recent years, but it always failed to get beyond the committee.

In speaking at the hearing on Jan. 14, H. I. Green, general counsel Illinois Traction System, declared that more than twenty industries along the company's lines between the McKinley Bridge and the Twelfth Boulevard station at Lucas Avenue have petitioned for the direct freight service the company seeks to install. All can be served without any further track extensions except spurs into their places of business. Mr. Green informed the Aldermen that of the system's 600 miles of tracks, 450 miles have direct connection into St. Louis. He said it is an imposition to ask shippers to continue to haul freight to and from the foot of the McKinley Bridge.

Buses of Connecticut Company Get Into Movies

An 800-ft. film to show how its buses are kept in operating condition at its main garage in New Haven has been prepared by the Connecticut Company, New Haven. A somewhat similar film was prepared some years ago with the trolley cars as the subject. The bus movie was shown at the company's booth at the Hartford Industrial Fair this past week and attracted very favorable attention.

The film story is based on a conversation between two bus passengers as to the way in which the company keeps its buses in so good a condition. The conversation is held in the central part of New Haven, after one of the single-deck Yellow type D buses, carrying 29 passengers, has made a passenger stop. The scene of the film then changes to the company's garage in New Haven. An exterior of this garage is first shown. Then, the spectator is introduced to the repair and maintenance methods of the company and learns how the buses are fueled and oiled at the end of the runs, how tires are changed, how the buses receive their periodical inspection, and how they are washed daily. Other views illustrate the process of removing the engine from the chassis through the use of an overhead crane, how the engines are taken apart and inspected, how cylinders are ground and pistons fitted.

Seven Cents Not Yet Authorized in Binghamton

The Public Service Commission issued an order Jan. 16 authorizing the Binghamton Railway, Binghamton, N. Y., to continue in effect the present 6-cent fare pending a determination by the commission of the company's petition for an increase in fare to 7 cents. The 6 cent fare expired Jan. 16. It has been in effect since 1920, but has been continued from year to year by the city and the commission.

Hearing is scheduled for Jan. 23, in New York. Consent of the city of Binghamton to the proposed increase was referred to previously.

Davenport Will Continue on Lower Fare Temporarily

The financial statement of the Tri-City Railway, Davenport, Iowa, for the 6 months test period ended Dec. 31, 1924, shows a marked deficit in operating expenses. Despite this the company has notified Mayor Louis E. Roddewig and the Davenport City Council that the right to increase fares to 10 cents straight on Feb. 1 will not be enforced for the present and that the sale of three tickets for a quarter will be continued until a more satisfactory adjustment of the fare problem has been worked out. In a letter to the Mayor and the City Council, R. J. Smith, general manager, announced that the company will retain the existing rates for the present, in the hope that future patronage of the railway lines will show that the patrons of the company appreciate the lower fares granted to regular patrons through the sale of tickets.

In making this announcement, the company calls attention to the fact that the offer to retain this present rate of fares must not be construed to mean that the company has relinquished its right under the fare agreement made with a previous Council. This agreement gave the company the right to increase its rate of fare to 10 cents straight on Feb. 1, 1925, if the income of the six preceding months failed to show a return of at least 6 per cent on the company's investment.

Montreal Tramway to Expand

Montreal's rapid growth in the past few years has brought about serious problems of traffic congestion that can only be solved by broad and sweeping changes in the downtown handling of the service by the Montreal Tramway, Montreal, Que, says the *Canadian Financial Post*. That paper says construction work will proceed very soon on a new terminal station on Craig Street, in the downtown section.

The new terminal station will be a modest affair at first, consisting merely of a covered structure adjacent to the power building, but it may in time become a sky-scraping head office for the tramways. Small as is the initial structure, the land acquired is costing the company about $500,000.

A committee of citizens and civic officials is now quietly at work producing a town-planning scheme for Montreal, and if some of the suggestions before the committee mature, the tramway and the city will have to cooperate in the construction of new lines, tubes and "arcades." The latter, while not touching the tramway directly, will enable it to improve its service. The plan is to move sidewalks on some main thoroughfares back about 10 ft. and build arcades under business structures to allow this to be done.

One of the local newspapers recently printed a story that the company intended to purchase the Montreal & Southern Countries Railway, but this was denied by officials. The line serves suburbs south of the St. Lawrence River. It is owned by Canadian National Railways.

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News Notes

Resumption of Service Expected.—Public subscriptions taken during the last fortnight have pledged sufficient funds for the repair of the Lincoln Municipal Street Railway, Lincoln, Ill. Mayor Voepel has predicted the early resumption of service on the traction line, suspended after the mid-December storm. Service, however, will be limited and fewer cars operated.

Jitneys in Richmond Disappear. — Jitneys passed out of existence in Richmond, Va., on Jan. 1 after being the cause of dissension for many years. Determined efforts were made to prevent their cessation by jitney interests. Patrons of the jitneys questioned the legality of the ordinance which was passed in the City Council last summer by a small margin. The City Council had previously defeated the ordinance several times.

Wants Continuous Seven-Cent Fare. —The Board of Commissioners of Bradley Beach, N. J., has requested the Coast Cities Railway for a continuous 7-cent fare from Bradley Beach to Deal Lake. A conference will be held on the matter. The company was also asked to grant a transfer at Main Street, Asbury Park.

Refuses Bus Fare Increase.—The Michigan Public Utilities Commission recently refused to accept the petitions of the Star Motor Coach Company and the Wolverine Transit Company for a further increase in fares to 2½ cents a mile. The two companies started some weeks ago a co-ordinating service with the Detroit United Railways.

No Reason for Granting Bus Permits.—Despite agitation by a few citizens of Webster, Mass., advocating the granting of bus licenses, Selectmen of the town have issued statements declaring they would not be warranted in granting licenses to buses to run parallel to the lines of the Worcester Consolidated Street Railway. The Selectmen do not agree with the unfavorable criticism of the railway, particularly of its service. Sight is taken of the fact that the Consolidated has contributed a large sum toward the new East Webster bridge, has paid for cement work around the tracks on Main Street and incurred much other expense in improving its lines.

Not Opposed to Buses Which Do Not Parallel Car Lines.—President Wesley W. Sargent of the Fitchburg & Leominster Street Railway says he will not oppose buses either inside or out of Fitchburg, Mass., so long as they do not run parallel to the car lines. Mr. Sargent said he was willing that the bus operators run bus lines over sections of the city where the railway had failed to make its lines pay, but he did not believe they should be allowed to compete with the railway.

Wants Railway Service Restored.—A petition signed by 1,560 residents of Spencer and Leicester, Mass., for restoration of railway service between Spencer and Worcester has been forwarded to the Worcester Consolidated Street Railway. The company discontinued service to Leicester and Spencer because unfair competition was permitted by local officials from bus lines.

Increased Rates in Effect.—The Empire State Railways, which operates a line between Syracuse and Oswego, N. Y., and the Rochester & Syracuse Railroad, which operates lines to Rochester, have put into effect new fare increases based on a rate of 3.6 cents a mile. The old rate was 3 cents a mile. Under the provisions of the Public Service Commission order the minimum fare is to be 5 cents, as at present. The Rochester line also secured an order reducing from 60 to 50 the number of persons required for a chartered car. Corresponding changes have been made in the charter car rates.

Another Direct Service to Downtown Chicago.—The Chicago & Joliet Electric Railway, control of which passed into the hands of Samuel Insull recently, will be linked direct to downtown Chicago in the near future via the elevated structure. Rapid transit will be afforded a great undeveloped territory heretofore unserved by any single agency going direct downtown.

Wife of Prominent Official Dies.—Mrs. Britton I. Budd, wife of the president of the Chicago Rapid Transit Company, Chicago, North Shore & Milwaukee Railroad and Public Service Company of Northern Illinois, died on Jan. 18 after an illness of several years. For many years Mrs. Budd took a very active part in charitable and social service work. She was an ardent student of music, astronomy, architecture and history. She was formerly secretary of the Amateur Music Club of Chicago and treasurer of the Guild of Associates of the Sisters of Saint Mary of the Episcopal Church. Interment was at Rosehill Cemetery after a private funeral service at the Church of the Atonement, Chicago.

Increased Fares Allowed.—Increased rates on the Pennsylvania-Ohio Power & Light Company's line between Youngstown and Hubbard call for a cash fare of 20 cents, but provide for commutation tickets at $3 good for 46 rides. Between Youngstown and stops 15 and 28 the tariff provides a cash fare of 10 cents and includes a provision for a ticket rate of six tickets for 50 cents. Increased rates were filed some few years ago, but were restrained by a court order. The United States Supreme Court recently dismissed the injunction.

Interurban Commutation Books at Discount.—The Texas Interurban Railway, Dallas, Tex., effective Jan. 1, has begun issuing commutation books of 30 tickets between designated stations at a discount of 40 per cent from the regular one-way adult fare. These books are good for 30 one-way trips within 20 days from date of sale.

Seeks Higher Fare.—The Manchester Street Railway, Manchester, N. H., has petitioned the Public Service Commission for permission to increase its fares from 8 cents to 10 cents. The company claims that one-man cars have saved some money, but the loss in passengers carried has more than offset the saving. The number of passengers carried in 1924 was the lowest since 1913.

Foreign News

Great Grimsby, England, to Operate Tramways. — The tramway in the Borough of Great Grimsby is to be purchased from the Great Grimsby Street Tramways Company by the city. The price to be paid was referred to arbitration and was fixed at £109,848, no allowance being made to the tramway company for possible loss due to the severance of the purchased lines from those outside the borough. The gross revenue inside Great Grimsby is about £44,368 per annum.

Reduced Student Fares Demanded in Turkey.—Demanding that special fares should be granted to them, a number of students made a demonstration against the Société des Tramways et Electricité de Constantinople, not only holding up operation of the electric street railways, but doing some damage to the company's office. Under pressure from the local authorities the tramway company granted reduced fares to the students for a period of 10 days, pending the submission of the question to the Turkish government at Angora. A decision was given in the tramway company's favor and orders issued for the protection of its property against further damages.

Paris Cars and Buses to Carry Merchandise.—Packages or merchandise are to be carried on the cars and buses operated by the Paris Transports en Commun. During certain hours half the rear platform space will be reserved for the purpose, and at night the entire platform will be used. The day rate will be the same as a full passenger fare for parcels weighing from 22 to 55 lb., and two fares for parcels from 55 to 110 lb., which is the heaviest permitted. The night rate will be uniform at 1.5 francs for parcels up to 110 lb.

Moscow to Buy Buses.—The government of Moscow, Russia, plans to place orders for buses abroad to the amount of 10,000,000 rubles, according to an announcement made by the Soviet deputation which has been visiting London, Paris and Berlin to study municipal questions. Offers of French firms were most acceptable and they received the first order.

Barcelona Opens New Subway.—The metropolitan subway of Barcelona, Spain which has been under construction for 10 years or more, has been inaugurated under the official auspices of the Infante Ferdinand, representing the King. This single route underground electric railway connects two opposite quarters of the city, supplementing an otherwise adequate street car system.

Japan to Electrify Railroads.—The Japanese government is planning to electrify 400 miles of its main line railroads, according to T. Ogawara of Tokio, assistant director of the government railway engineering bureau, who is in the United States traveling in the west. The purpose of Mr. Ogawara's visit is to study the steam and hydroelectric plants of the United States and to discuss Japan's need with American manufacturers of equipment.

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Financial and Corporate

Purchase Talk Revived at San Francisco

The special committee appointed by Mayor Rolph of San Francisco, Cal., to consider purchase of the Market Street Railway is scheduled for a meeting at which it is expected arrangements will be made for further negotiations with officials of the Market Street Railway to try to bridge the difference in valuations.

The Council has before it a revised appraisal of the Market Street Railway just completed by Fred Bullock, special accountant. It is said that his figures will bring the valuation up to nearly $30,000,000, compared with $27,000,000 three years ago.

Alternative plans for carrying out the proposal have been suggested as follows:

1. Vote bonds either for the entire purchase price or enough to provide a down payment to the company.
2. Amend the charter to permit an increase of fares to 6 cents to provide greater revenue in a "pay-as-you-go-plan."

When negotiations were in progress earlier in the year, the "pay-as-you-go-plan" was agreed upon as the best means of financing the purchase. It is said now that the adoption of a plan of this kind would be out of the question, particularly under the increased schedule now in force to trainmen.

Refunding Plan at Worcester to Be Modified

Instead of drawing up a new consolidated mortgage the Worcester Consolidated Street Railway, Worcester, Mass., has altered its plans and will use a first mortgage instrument, under which $3,551,000 bonds are held in the treasury unissued.

In November a petition was filed with the Massachusetts Public Utilities Commission requesting authority to set up a mortgage, subject to underlying liens, whereby $7,000,000 in consolidated mortgage bonds could be issued primarily to retire maturing bonds. Because of the size of the underlying liens, it was finally decided that the offering would probably meet with greater success and command a better price if the old first mortgage was used as the financing instrument. The company therefore plans to withdraw the petition before the Public Utilities Commission and ask authority to issue additional bonds under the old first mortgage.

The maturities of the company during the next 3 years total $3,083,000 Under the first mortgage, which is known as the Worcester Consolidated Street Railway first and refunding mortgage, the company issued $1,449,000 of 4½ per cent bonds in 1910. As the authorized limit is $5,000,000 the company still holds $3,551,000 unissued bonds.

A problem before the company is the interest rate. It is probable that the new securities will carry an additional coupon to be cashed with the semi-annual 2¼ per cent coupon.

Approval of Permanent Financing Measure Sought in Philadelphia

W. C. Dunbar, president of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has submitted the draft of an ordinance to the president and members of the City Council seeking permission definitely and permanently to place its $10,000,000 5 per cent issue authorized in 1911. Two changes are desired in the financing of these bonds in order to take advantage of the present favorable market conditions. First, the company wishes to increase the interest rate from 5 per cent to 6 per cent, which will enable it to sell the bonds at or near par. Second, it is desired to make the bonds a direct mortgage lien upon the Market Street Elevated Passenger Railway. The statement says that this is a change in form but not in substance, since under the existing provisions of the indenture now securing the issue the entire equity in the Market Street property is indirectly pledged. The proceeds derived from the sale of these bonds will be used, first, to pay off the loan already secured and for which these bonds are now held as collateral, and, second, to finance the down payment upon the equipment purchased under the P. R. T. series "H" equipment trust and for other additions and betterments to property.

Duluth Valuation Fixed at $5,009,510

Court Decides 6-Cent Fare, with Five Tickets for 25 Cents, Confiscatory—Adds 40 per Cent to Pre-War Cost of Pre-War Property to Give Effect to Present Day Prices

JUDGE WILBUR F. BOOTH of the District Court of the United States for the District of Minnesota on Dec. 29, 1924, rendered a decision in the suit brought by the Duluth Street Railway to enjoin the enforcement of an order of the Railroad and Warehouse Commission of Minnesota fixing the rate of fare at 6 cents cash with five tickets for 25 cents. The city of Duluth appeared as intervenor-defendant in the suit. The court fixed the fair rate base at $5,009,510 and found a 7½ per cent rate of return reasonable. The decision was referred to briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 10, page 73.

On July 13, 1922, the Railroad and Warehouse Commission made its first finding of fair value, rate of return and rate of fare. This it did under the new statute of the state of Minnesota enacted April 14, 1921, under which the street railways of the state were authorized to surrender existing franchises with the municipalities and accept indeterminate permits of the state of Minnesota, subject to regulation by the state commission and subject to an appeal providing for the trial of the case *de novo* by the state courts of Minnesota and consequently requiring the introduction of detail evidence of inventory, valuation, etc., in such case.

SIX-CENT FARE UNDER COURT ORDER

The Duluth company secured from the United States District court, Judges Sanborn, Morris and Booth presiding, a temporary restraining order permitting the charge of a 6-cent cash fare and compelling the company to issue receipts to passengers desiring to take advantage of the 5-cent ticket rate and the revenue representing such receipts to be held in escrow pending the final decision of the United States court in respect to the rate of fare. The case was tried before the Special Master in Chancery, who rendered his report to the United States court on Dec. 10, 1923. Exceptions were filed by

COMPARATIVE VALUATIONS OF DULUTH STREET RAILWAY—DULUTH DIVISION

	A. L. Drum & Co. Estimated Original Cost	Minnesota Railroad and Warehouse Commission's Decision, Dated July 13, 1922	Decision of U. S. District Court, Dated Dec. 29, 1924
Inventoried property excluding land and materials and supplies	$3,487,020	$3,487,020	$3,487,020
Expenditures not apparent in inventory	6,385	.....	6,385
General overheads	759,642	488,183	369,534
Land	150,735	140,000	128,474
Materials and supplies	105,787	105,000	105,000
Cash working capital	87,312	30,000	30,000
Total cost new	$4,596,881	$4,250,203	$4,126,413
Appreciation of pre-war property to give effect to present-day prices	.....	514,797	1,132,075
Per cent appreciated	.....	16.04	40.00
Total cost new, after giving effect to present-day prices	$4,596,881	$4,765,000	$5,258,488
Condition of depreciable property, per cent	86.02	83.00	83.00
Amount of depreciation deducted	510,548	763,300	786,331
Total cost new less depreciation, after giving effect to present-day prices	$4,086,333	$4,001,700	$4,472,157
Cost of financing	229,844	.....	89,075
Total physical property	$4,316,177	$4,001,700	$4,561,232
Going value	800,000	500,000	350,000
Value of power contract	379,542	91,300	91,300
Additions July 1, 1921, to Dec. 31, 1921	6,978	6,978	6,978
Grand total	$5,502,697	$4,599,978	$5,009,510

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the interested parties and the case was heard by Judge Booth.

The decision rendered by Judge Booth released the company from impounding funds to cover the 5-cent ticket rate and establishes several important points in the valuation of electric railway properties. For instance, the court held:

1. That when the Railroad and Warehouse Commission made and filed its findings the legislative stage of the case was ended at that point and the judicial stage was reached and that the hearing before the state District Court on appeal provided for in the Minnesota statute is judicial and not a continuation of the legislative rate-making process, and that under such circumstances the street railway company had the right to bring the present suit in the federal court.

2. That a test period of rates fixed by the commission is not an indispensable prerequisite and that the present suit in the United States court was not premature as contended by the state commission and the city of Duluth.

As to the fixing of rates by the United States court, the court said:

The proceedings before the special master and in this court are not for the purpose of fixing a rate, but to determine whether the rate fixed by the commission is confiscatory. In Pacific Gas & Electric Company vs. City and County of San Francisco, United States Supreme Court, June 2, 1924, the court said: "Rate making is no function of the courts. Their duty is to inquire concerning results and uphold the guarantees which inhibit the taking of private property for public use without just compensation, under any guise."

Nevertheless, it is held that the parties are entitled to the independent judgment of the court upon the findings and conclusions of the commission. Bluefield Co. vs. Pub. Ser. Com., 262 U. S., 679, 689.

The court added 40 per cent increase to the estimated pre-war cost of pre-war property to give effect to present day prices.

The court allowed a per cent condition of 83, the same as found by the commission, as compared with the per cent condition of 86.02 found by A. L. Drum & Company, consulting engineers for the company, from the inspection of property.

The court allowed the estimated original cost of general overheads without depreciation.

The court allowed $91,300, the value found by the commission, for the hydro-electric contract for power. In discussing the power contract the court stated:

This contract has proved very advantageous and the steam plant has been superseded and has been dismantled. A larger amount would have been justified (referring to the $91,300 allowed by the commission). . . . The master allowed nothing for this item, saying in his report:

"While this contract might be taken into consideration upon a sale of the property or a valuation for that purpose, it should not be considered in ascertaining the proper basis for rates as it belongs to the class of provident economical contracts which it is the duty of the company to make whenever possible so as to furnish economical service to the public."

I am not able to agree with the master in this view. The contract was a thing of value, and it differed from an ordinary contract for current supplies. It took the place of a physical plant which would otherwise have been necessary and would have been valued as a part of the physical items.

Under these circumstances I think the commission was justified in including this power contract as an item in the rate base.

The court allowed $350,000 for going value figured on 10 per cent on the original cost of the inventoried physical property, excluding land and materials.

The commission excluded cost of financing, but the court allowed $89,075 for cost of financing, stating:

In my opinion this is an item which should only be included provided the evidence shows that it had an actual as distinguished from a theoretical existence.

The court allowed the 7½ per cent rate of return as found by the commission.

The court allowed an item of hidden costs claimed by the company for expenditures incurred in the past on account of contributions imposed by city ordinances for civic improvements.

The court and commission adopted as plant base the estimated original cost of the inventoried property, excluding land and material and supplies, as agreed upon between A. L. Drum & Company, consulting engineers, representing the Duluth Street Railway, and B. T. Gifford, consulting engineer, representing the city of Duluth.

The tabulation published herewith gives a comparison of the values of the property as found by the United States court with the values found by the Minnesota commission and with the estimated original cost valuation found by A. L. Drum & Company.

The Master in Chancery found the value of the property under the several different bases to be as follows:

Value for rate-making purposes	$4,599,978
Cost of reproduction, less depreciation, including going value	5,138,504
Estimated original cost	4,222,573

Separate Investment Company in New Jersey

Articles of incorporation for the Public Service Stock & Bond Company, Newark, N. J., organized to do a general business in investment securities, but to specialize in securities of the Public Service Corporation of New Jersey and its subsidiaries and underlying companies, were filed on Jan. 16 with the Secretary of State at Trenton.

The incorporators are Thomas N. McCarter, president of the Public Service Corporation of New Jersey; E. W. Wakelee and Percy S. Young, vice-presidents. The papers authorize 500,000 shares of no-par-value stock, which will be owned, except for qualifying directors' shares, by the Public Service Corporation. A million dollars will be paid into the treasury of the new company at the start of business on Feb. 1.

Mr. Young, in charge of finance of the Public Service Corporation, said:

The success of our various customer-ownership campaigns has given us a total of more than 70,000 stockholders and subscribers to stock. Adding bondholders and those who own securities of underlying companies, there are more than 120,000 financially interested in various Public Service enterprises.

Mr. McCarter will be president and Charles G. Colyer vice-president, in charge of the company's activities. T. W. Van Middlesworth will be treasurer and Charles M. Broder secretary. The company will have offices in the Public Service Terminal Building, Newark.

Customer-Ownership Campaign at Reading

Customer ownership is the purpose of a campaign being conducted by the Reading Transit Company, Reading, Pa., for the sale locally of $1,250,000 of first and refunding mortgage gold bonds, series A, 6 per cent, dated Nov. 1, 1924, and due Nov. 1, 1954. The offering price is 98 and accrued interest to yield 6.15 per cent. In calling attention to the offering the company said that another opportunity is offered prudent investors to share in the earnings of one of their important public utilities, the first having been afforded in the sale of cumulative participating

Conspectus of Indexes for January, 1925

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Jan. 1925 **7.17**	Dec. 1924 **7.17**	Jan. 1924 **6.91**	May 1921 **7.24**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	Jan. 1925 **150.3**	Dec. 1924 **148.7**	Jan. 1924 **158.5**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Jan. 1925 **221.0**	Dec. 1924 **220.8**	Jan. 1924 **217.4**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Dec. 30 1924 **4.82**	Nov. 30 1924 **4.03**	Dec. 31 1923 **4.45**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	Dec. 1924 **18.23**	Nov. 1924 **16.66**	Dec. 1923 **17.30**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number	Dec. 1924 **18,07**	Nov. 1924 **1,471**	Dec. 1923 **1,858**	Jan. 1924 **2,231**	Sept. 1924 **1,277**
Liabilities (Millions	**51.60**	**29.51**	**80.30**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	Jan. 1925 **210.4**	Dec. 1924 **208.6**	Jan. 1924 **217.9**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Dec. 1924 **157.0**	Nov. 1924 **152.7**	Dec. 1923 **151.0**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Jan. 1 1925 **13.93**	Dec. 1 1924 **13.53**	Jan. 1 1924 **13.27**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Jan. 1 1925 **202.6**	Dec. 1 1924 **198.0**	Jan. 1 1924 **189.9**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Dec. 1924 **152**	Nov. 1924 **150**	Dec. 1923 **150**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Dec. 1924 **166.1**	Nov. 1924 **165.2**	Dec. 1923 **165.0**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials.

Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

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preferred stock of the Metropolitan Edison Company, with which the Reading Transit is affiliated.

The fact is emphasized that net earnings of the railway during the past year were more than three and one-half times the interest requirements on these bonds and the underlying divisional bonds. It is further pointed out that the mortgage under which the bonds are issued provides that 18 per cent of the gross revenues shall be devoted to the maintenance of the property each year, this amount being based on the experience of recent years, during which about $200,000 was expended annually on the upkeep of the system.

The issue of bonds now offered is a direct first mortgage on important property owned by the company in and about the city of Reading, conservatively valued at $2,600,000. This property includes the two main office buildings on South Fifth Street, carhouses, shops, other buildings, and the two plots of land they occupy on North Tenth and Eleventh Streets, the entire system of the Reading & Womelsdorf Electric Railway and all of the cars owned by the company, about 200 in number.

The proceeds from the sale of the bonds are to be used to retire $400,000, principal amount, of first mortgage bonds of the Reading & Womelsdorf Electric Railway, which fell due on Jan. 1, 1925, $40,000 principal amount of car equipment trust certificates and for other corporate purposes, principally improvements and betterments that are expected to be reflected in increased earnings for the company.

The Reading Transit Company was formerly known as the Reading Transit & Light Company. It operates about 200 miles of electric railway which it owns outright or controls through long-term leases, serving a population of more than 425,000.

Railway Service Discontinued in Rutland

Railway service in Rutland, Vt., has been withdrawn by the Rutland Railway, Light & Power Company. This move entirely eliminates electric railways as a transportation factor in and around Rutland, other lines connecting Rutland with neighboring towns having been supplanted previously by bus service. The buses that are being operated in the territory abandoned are not affiliated in any way with the railway. Rutland is a town of 15,000 inhabitants. Included in the railway system were 30 miles of track. The cash city fare has been 7 cents with four tokens for 25 cents.

Made Director. — J. S. McCulloch, president of the Union National Bank, Philadelphia, has been named successor to Col. Sheldon Potter as city member of the board of directors of the Philadelphia Rapid Transit Company. Colonel Potter resigned a month ago.

Foreclosure Ordered.—Foreclosure of a mortgage of $375,000 against property of the Groton & Stonington Street Railway, Norwich, Conn., has been ordered by Anson T. McCook of Connecticut, acting in response to the request of a majority of bondholders. The Groton & Stonington Street Railway was controlled by the Groton & Stonington Traction Company, included in the system of the Shore Line Electric Railway.

Purchase Permitted. — The Public Service Commission has issued an order consenting to the purchase by the Niagara Falls Power Company of the capital stock of the Niagara Gorge Railroad and to the creation of a trust indenture for $1,000,000 and the issue of $949,000 in Niagara Gorge collateral trust 5 per cent gold bonds to be secured thereby. The power company has plans for the improvement of the road and the extension of its business, it was brought out at the hearing at Buffalo on Dec. 29. Certain riparian rights in the lower Niagara River are also acquired by the purchase of the railway.

Report of Portland Purchase.—The Albert Emanuel Company, New York, is reported to be negotiating for the purchase of three blocks of stock in the Cumberland County Power & Light Company, Portland, Me., which controls the Portland Railroad. The blocks which will be purchased if the deal goes through are said to be the holdings of E. W. Clark & Company of Philadelphia, J. & W. Seligman & Company, New York, and A. B. Leach & Company, New York. All the stock which figures in this transaction is common stock. Common stock in the company amounts to 30,000 shares. There are 40,000 shares of the preferred stock.

Most of Equipment to Be Scrapped. —The tracks and equipment of the Milford, Attleboro & Woonsocket Street Railway will be scrapped, according to Simon I. Edinburg of the Edinburg Meter Company, Worcester, Mass., who has purchased the equipment from the receivers. The cars were not included in the sale. The purchase price was not divulged. The property was bought subject to the approval of the Superior Court. There is about 30 miles of trackage. The line was abandoned more than a year ago.

New Members of Board Chosen.— At the meeting on Jan. 19 the number of directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was increased from 16 to 18. Charles Hayden and Travis H. Whitney were added to the board.

Property Transferred.—The Tiffin & Fostoria Railway, Tiffin, Ohio, ceased to exist on Jan. 1. Sale of the company's properties, a 14-mile line linking Tiffin and Fostoria, to the Toledo, Fostoria & Findlay Railway was completed with a formal transfer made on Jan. 1. The purchasing company will continue the operation of the line on a rearranged schedule and will start a through Toledo-Findlay service.

Purchase Makes Personnel Change in Property.—The purchase of the Chicago & Joliet Electric Railway, Joliet, Ill., by the Central Illinois Public Service has caused changes in the official personnel of the new company. J. R. Blackhall, general manager of the railway, has been re-elected a director with William Redmond and George Woodruff, Joliet. Marshall E. Sampsell, Chicago, was elected president and a director, succeeding Van Horn Ely, Philadelphia; Mr. Blackhall is vice-president; Martin J. Insull, Chicago, is a director, succeeding C. S. L. Tingley, Philadelphia; LeRoy J. Clark, Chicago, succeeds W. G. Clayton, and J. Paul Clayton, Springfield, succeeds W. R. Lippincott, Philadelphia. The complete official personnel is: Mr. Sampsell, president; J. Paul Clayton and J. R. Blackhall, vice-presidents; Mr. Clark, secretary; C. L. Nash and R. N. Tulpin, Springfield, assistant secretaries; C. E. Cripe, Springfield, treasurer, and C. Nash, Springfield, assistant treasurer.

Sale of Railway Reported Under Way. — Sale of the Valley Railways, Lemoyne, Pa., operating 44 miles of electric railway, principally in Carlisle and Lemoyne, is now virtually certain, subject only to the approval of the Public Service Commission. Almost 95 per cent of the stockholders have assented and deposited their stock, and about 80 per cent of the holders of the $1,700,000 bonds have done likewise. The offer of purchase is said to have been on the basis of par for the bonds and $44 a share for the stock. The identity of the purchaser has not been disclosed.

Preferred Stock Issue Proposed in Philadelphia.—The annual meeting of the stockholders of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will be held on March 18 to elect directors for the ensuing year, and transact such other business as may come before the meeting, including the approval or disapproval of a proposed increase of the capital stock of the company from $30,000,000 common stock to $30,000,000 common stock and $3,000,000 preferred stock or a total increase from $30,000,000 common stock to $33,000,000 common and preferred stock.

Railway Man Bus Bidder.—Harry B. Weatherwax, vice-president of the United Traction Company, Albany, N. Y., was one of the bidders at the recent sale of the franchise and equipment of the W.I.A.T. Bus Corporation before Justice Frank Cooper in federal court. Rutherford B. Hayes, prominent Albany builder and contractor, bid in the franchise and equipment at $14,050. Mr. Hayes announced his plans to buy 10 new buses and spend nearly $100,000 to rehabilitate the line. Benjamin Wheat was the other bidder. Mr. Weatherwax instructed his attorney to stop bidding at $14,000, while Mr. Wheat withdrew from the bidding at $9,100. The purchase must be approved by the Common Council of the city of Albany and the Public Service Commission before the transaction will become effective.

Sale of More Railway Lines Said to Be Under Way.—Negotiations for the sale of more American Electric Power Company properties to other utility interests are reported from Philadelphia. The properties are the Scranton Railway, Scranton, Pa., and the Altoona & Logan Valley Electric Railway, Altoona, Pa. The American Electric Power Company recently sold the Chicago & Joliet Electric Railway, along with other properties, to the Central Illinois Public Service Corporation, acting for the Middle West Utilities Company, Chicago.

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Personal Items

J. P. Barnes Heads Kentucky Utilities Association

James Phillips Barnes, president of the Louisville Railway, Louisville, Ky., has had another honor conferred upon him. He has just been elected president of the Kentucky Association of Public Utilities, meeting at the Hotel Seelback, Louisville, Jan. 16. In that post he succeeds J. P. Pope, general manager of the Kentucky Traction & Terminal Company, Lexington. Mr. Barnes was the subject of an extended biographical sketch in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 23, 1923, on the occasion of his election to the presidency of the Central Electric Railway Association. Association honors are accordingly not new to him. As far back as 1917 he was president of the New York Electric Railway Association. He has also been a member of the executive committee of the American Electric Railway Association.

Wherever he has been located in a managerial capacity Mr. Barnes has been sought out for important association work because of his ability to mix and to get things done through cooperation. This ability has been recognized outside of official railway circles, with the result that the roster of Mr. Barnes' activities there includes his acting as a president of the Louisville Council, Boy Scouts of America; treasurer of the Arts Club and a director of the Citizens' Union National Bank and the Louisville Industrial Foundation. Probably not even Mr. Barnes himself could name all the clubs and associations of which he is a member in Louisville and other cities.

Alfred S. Davis Promoted at Providence

Coincident with the election of Walter Slade as vice-president of the United Electric Railways, Providence, R. I., Alfred S. Davis was appointed to the position of superintendent of power and lines. He has assumed full charge of the duties formerly performed by Mr. Slade. Mr. Davis is a newcomer in Providence. When the company launched a power expansion program about 2 years ago his services were secured. He was then assistant superintendent of power and lines. Previous to that time he had spent 2 years with Stone & Webster. He had also had experience in supervising power plants for the Connecticut Company. Mr. Davis' early engineering work began in 1900 with Eaton, Chase & Company.

After 4 years with this concern in the practice of installing steam and electrical machinery, he entered Tufts College and was graduated in 1908 with the degree of B.S. He then spent several years with the J. G. White Engineering Corporation and one year with the Electric Bond & Share Company. The appointment of Mr. Davis to the United Electric Railways was mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 20, 1923.

L. C. Datz with Bankers

Engineer Joins Newman, Saunders & Company, Inc., St. Louis Reorganization Managers

L. C. Datz has resigned as chief engineer of the Memphis Power & Light Company to become affiliated with the firm of Newman, Saunders & Company, in the reorganization of public utility properties in the Middle West. He will make his headquarters in St. Louis. Mr. Datz has been actively engaged in public utility work ever since he was graduated from Tulane University of Louisiana in 1901, with the exception of 2 years when he was associated with a New Orleans contractor in designing and constructing dredges, dredging and cane loading machinery.

L. C. Datz

In 1903 Mr. Datz entered public utility work with the New Orleans Railway & Light Company. In 1911 he went with Ford, Bacon & Davis as assistant engineer, and a year later, when the American Cities Company was organized by Ford, Bacon & Davis and the New Orleans Railway & Light Company became a part of this group of Southern properties, he returned to the New Orleans company and served successively as engineer maintenance of way, engineer of roadway and chief engineer of this system.

When the United Gas & Electric Engineering Corporation established an office in the South in 1914, Mr. Datz became engineer of its Southern properties, with supervision of public utility properties in New Orleans, Houston, Birmingham, Memphis, Knoxville and Little Rock. He resigned as vice-president of this corporation in 1919, to become chief engineer of the American Cities Company, which at that time formed an organization of its own to supervise its properties. He served in this capacity until April, 1922, when the American Cities Company was taken over by the National Power & Light Company, at which time he went to Memphis, Tenn., to become chief engineer of the Memphis Gas & Electric Company, and chief engineer of the Little Rock Railway & Electric Company, now under the supervision of the Electric Bond & Share Company.

When the Memphis Power & Light Company was organized on Jan. 1, 1923, Mr. Datz became chief engineer of that company, and since then has given his entire attention to the very extensive construction program it has carried on in the past two years.

Mr. Datz has always taken an active interest in engineering association work, both national and local. He is a member of the National Electric Light Association and of the American Electric Railway Engineering Association, serving as president of the latter in 1923. He is a member of the American Society of Mechanical Engineers, American Society of Civil Engineers, American Society for Municipal Improvements, and a member and past-president of the Louisiana Engineering Society.

H. W. Brundige President of California Commission

Harley W. Brundige has been elected president of the Railroad Commission of California. He succeeds Commissioner Clyde L. Seavey, who has held that position for the last 2 years.

Commissioners George D. Squires and Ezra W. Decoto, who were appointed by Gov. Friend W. Richardson to succeed Commissioners Irvin Martin and James T. Whittlesey, terms expired, have assumed their duties as members of the commission.

Commissioner Squires served as Insurance Commissioner of California the last 2 years. He is a practicing attorney. Commissioner Decoto has served a number of years as District Attorney of Alameda County. He is also an attorney of many years experience.

Bert Collett General Manager at Oak Park

Bert Collett, general superintendent of the Chicago & West Towns Railway, Oak Park, Ill., since 1921, was appointed general manager on Jan. 1, 1925. The position he formerly held has been discontinued. Mr. Collett entered the railway field in 1906 as superintendent of the Muncie & Portland Traction Company, Portland, Ind. He remained with this company in that capacity for 6 years. He then took on the duties of claim agent for the County Traction Company and the Chicago & West Towns Railway, the successor of the County Traction Company. Here he remained for another 6 years, up to 1918. In that year he became superintendent of transportation and gave his attention for the next 3 years to bettering the details of carrying passengers. Then it was that he assumed

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the rôle of general superintendent. The property of which he is now general manager operates 70 miles of line and connects Oak Park, River Forest, Maywood, Melrose Park, Cicero and other important places in the vicinity of Chicago.

Walter C. Slade Vice-President at Providence

Walter C. Slade is the new vice-president of the United Electric Railways, Providence, R. I. To this position he was promoted from that of superintendent of power and lines, which he assumed in September, 1915, when the local railway property at Providence was known as the Rhode Island Company.

During his last two years of service as superintendent of power and lines Mr. Slade's work was especially noteworthy. In addition to supervising the regular operation and maintenance of the power and line departments he had general supervision over the work of planning and constructing extensive

W. C. Slade

improvements on the power system involving the expenditure of slightly more than $2,000,000. These improvements involved an extensive modernization program in the power plant, the construction of two new substations, improvements in three more substations, the construction of additional overhead, an underground transmission circuit and the installation of a track circuit block signal system on a high-speed line.

His first position was with the General Electric Company, at Pittsfield, Mass., in the laboratory staff. He was born in Providence in 1885 and was graduated from Brown University with the degree of Ph.D. in 1907. Later he was graduated from the Massachusetts Institute of Technology.

V. W. Burley Appointed Assistant Manager at Binghamton

V. W. Burley, general superintendent of the Binghamton Railway, Binghamton, N. Y., was recently appointed assistant general manager by President Fuller with the approval of the board. In announcing the promotion of Mr. Burley, President Fuller said the details of the work of management had increased so rapidly within the last year that he could not give them sufficient attention, and, further, that every assignment given to Mr. Burley in the last few years had been handled with distinction and good results to the company and with satisfaction to him.

The new assistant general manager has been general superintendent only since April, 1923. He entered the employ of the Binghamton Railway as a conductor in 1910. For 10 years before that he had been connected with the Pennsylvania Railroad. It is believed that he, above all other people, is best suited to fill the position of assistant general manager, having fulfilled the duties of conductor, inspector, dispatcher, claim agent and superintendent of transportation.

F. M. Black Made Vice-President at Winnipeg

F. M. Black, Provincial Treasurer of Manitoba, has been offered the specially created position of vice-president in charge of finances of the Winnipeg Electric Company, Winnipeg, Canada. Mr. Black is regarded as one of the outstanding financial men in western Canada, where he has been held in high repute for a number of years. In 1916 and 1917 he was president of the Calgary Board of Trade and in 1917 was also a member of the Alberta Public Utility Commission. For some time during the war he was on the staff of the Food Control at Ottawa, and later became associated with the United Grain Growers' Association. This last position he relinquished when he resumed his position as Provincial Treasurer.

In announcing the important appointment, A. W. McLimont, vice-president and general manager of the Winnipeg Electric Company, said that in view of the growth and development of the business of his company and its subsidiaries during the past few years and the increased activities required in connection therewith, it had been considered advisable to have associated with the company some person of broad financial experience who could devote all of his time to that branch of the company's affairs. It was with this object in view that the position of vice-president was created for Mr. Black and accepted by him.

Premier Bracken of Manitoba has expressed the regret of the government in losing so able a minister as Mr. Black, who handled the finances of the province during a most difficult time and had thereby won for himself great appreciation.

John T. Lyle, Jr., is first vice-president of the Meridian Light & Railway Company, Meridian, Miss., succeeding S. B. Irelan.

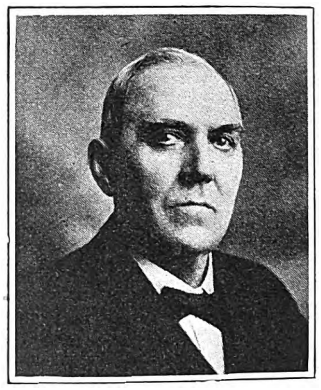
J. H. Bruce, traffic manager of the London County Council Tramways, London, England, who was appointed to take over the management of the system until Dec. 31, following the retirement of A. L. C. Fell, will be continued as operating manager until April 30 next.

Obituary

John Z. Murphy

John Z. Murphy, electrical engineer for the Chicago Surface Lines, Chicago, Ill., died Jan. 17 at Phoenix, Ariz., where he had gone to recuperate his health. He had been connected with surface railway operation in Chicago nearly 40 years. Mr. Murphy began his engineering career with a primitive mode of transportation—water. This connection was with the old Michigan & Illinois Canal, but shortly thereafter his engagements widened to include other canals and to embrace railroads and public works. In 1889 he became chief operating engineer for the West Chicago Street Railway and subsequently was noted for his work in the construction of tunnels under the Chicago River.

In other words, from 1876 to 1889 Mr. Murphy was continuously engaged in engineering work on railways, canals and public enterprises throughout the Middle West. Problems in marine engineering also received much attention and his years were busy ones.



J. Z. Murphy

As the engineer in charge of the Rockwell and Madison Streets power house for the West Chicago Street Railway he successfully surmounted some very serious obstacles in construction and won the admiration of members of his profession. When the power house machinery was accepted Mr. Murphy returned to the lakes in 1889 as chief engineer for the Marrinet Barge Company.

In 1892 the late John M. Roach appointed Mr. Murphy chief engineer for the West Chicago Street Railway. In 1908 he was made chief engineer for the Union Traction Company. In 1914, following unification of surface lines, he became electrical engineer for the Chicago Surface Lines, a post he held at the time of his death. He was also a member of the Chicago board of supervising engineers.

As long ago as October, 1911, the Chicago *Examiner* in a series of articles on men who had done most for Chicago said that in the engineering profession no man stood higher in that city than Mr. Murphy, engineer in charge of the vast work of reconstruc-

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tion and rehabilitation of the West Chicago Street Railway and the Union Traction Company and who had been continued in his high position by the Chicago railways. That paper said:

In the upbuilding of the West where today stand the giant enterprises representative of the prowess of our age there have been required men of high courage, of broad views and of inventive minds to plan and to execute, and Chicago and the West owe a debt to the engineers, civil, mechanical and electrical, whose genius has made our present achievements possible.

And in that select company the *Examiner* said Mr. Murphy stood very high.

Mr. Murphy was born in Chicago in 1857.

Secretary of Cleveland Fare Box Company Dead

Sara E. Brannon, secretary-treasurer of the Cleveland Fare Box Company since its organization in 1911, died Jan. 5, following a wound received while she was on a mission of mercy. In 1908 Miss Brannon was employed by W. T. Cook as secretary. He was at that time general superintendent of the Municipal Traction Company, Cleveland. She continued with him in that capacity under the receivership that followed the Municipal Traction Company. It was a few years later when the Cleveland Fare Box Company was organized that she went to that company as secretary-treasurer and she continued in that capacity up to the time of her death. Miss Brannon was 43 years old. She went to Cleveland in 1904, working for the next 4 years with the Land Title Abstract & Trust Company. She was born in Mageetown, Pa., and attended college in Meadville.

John M. Johnson, traffic supervisor of the Columbus Railway, Power & Light Company, Columbus, Ohio, died recently. He had been identified with the company for 32 years.

Charles Barnes Beckwith, president of the Beckwith-Chandler Company, New York, N. Y., and Newark, N. J., varnish and paint manufacturers who specialize in products for steam and electric railways, died suddenly on Jan. 20 of heart disease, at the age of 62.

Charles H. Clark, president of the Waterbury & Milldale Tramway, Waterbury, Conn., died on Jan. 17, aged 92. Mr. Clark was president of the Southington Bank & Trust Company and the Clark Brothers Bolt Company. He served in the Legislature and was the oldest active bank president in Connecticut.

Arthur D. Prince, senior assistant division engineer of the Board of Transportation of the City of New York, died on Jan. 20. Mr. Prince was born at Glen Cove on Oct. 21, 1870. He was graduated as a civil engineer from Columbia in 1899 and joined the engineering staff of the Metropolitan Street Railway, New York. Later he went into the Department of Public Works and the Department of Street Improvements in New York City. He was assistant engineer in charge of highway construction in the Bronx. In 1900 he became assistant engineer to the old Public Service Commission.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Standard Forms Adopted

Standard invoice, purchase order and inquiry forms for recommended use by all branches of American industry and commerce were adopted by a national conference held under the auspices of the Division of Simplified Practice, Department of Commerce, at Washington, D. C., Jan. 14. Forty-five organizations were represented at the conference. These included the producer, distributor and consumer as well as the wholesaler and retailer in the leading commercial fields.

The movement started in 1919, when 417 associations were invited by the National Association of Purchasing Agents to a conference in Philadelphia to discuss the subject. For 2 years thereafter a joint committee representing the Railway Officers' Accounting Association, the American Railway Association, the National Association of Cost Accountants and the National Association of Purchasing Agents studied the problem from every angle. In 1921 a national standard invoice form was adopted by these four associations for recommended use by its members. Since that time a number of other large associations have officially indorsed it and have put it to actual use.

A survey of a large number of representative firms showed an estimated average saving of $620 a year if all invoices received were standardized. This would amount to an aggregate annual saving of $15,000,000 in all lines of American business. Since this figure applies only to the standard invoice, the conference has started a movement which will involve a much larger figure through the standardization of purchase order and inquiry forms as well.

Copies of the standard invoice, inquiry and purchase order forms as adopted by the conference may be secured upon application from the Division of Simplified Practice, Department of Commerce, Washington, D. C., or from the National Association of Purchasing Agents, Woolworth Building, New York, N. Y.

Virginian Railway Locomotive Inspected

An inspection by officials of the Virginian Railway, American Locomotive Works and the Westinghouse Electric & Manufacturing Company recently was made of one of the new Virginian electric locomotives. It was built by the American Locomotive Works and had just arrived at East Pittsburgh, where the electrical equipment was installed by the Westinghouse company.

This is the first unit to be built in connection with the $15,000,000 electrification project of the Virginian Railway to electrify 134 miles of line, including 213 miles of track, lying between Roanoke, Virginia, and Mullens, W. Va. Three motive power units comprise one complete locomotive, making it the largest in the world.

Two Big Wheel Companies Merge

The National Car Wheel Company and the Southern Wheel Company were merged on Jan. 1, 1925, and are now operating under the name of the Southern Wheel Company. The plants are located at Pittsburgh, Sayre, Pa.; Cleveland, Rochester, St. Louis, Birmingham, Atlanta, Savannah and Portsmouth, Va. The company manufactures chilled iron wheels at all these plants, and in addition mine cars and parts at St. Louis and Birmingham, also miscellaneous gray iron castings at Pittsburgh. The general offices are in the Keystone Building, Pittsburgh. This company is a subsidiary of the American Brake Shoe & Foundry Co.

Bituminous Production Large

Figures compiled by the Department of the Interior indicate that the total output of soft coal for 1924 will be approximately 467,700.000 net tons. This is nearly 100,000.000 tons less than was mined in 1923, but is in excess of the production for 1919, 1921 or 1922. In comparing this estimate with the final figures for earlier years, however, it must be remembered that the preliminary estimates are usually from 2 to 3 per cent too low. It is possible, therefore, that final figures may show a total for 1924 as high as 480,000,000 tons. The production by years is given in the accompanying table.

ESTIMATED PRODUCTION OF BITUMINOUS COAL (Net Tons)

Calendar Year	Production
1918	579,386,000
1919	465,860,000
1920	568,667,000
1921	415,922,000
1922	422,268,000
1923	564,157,000
1924 (preliminary)	467,700,000

Metal, Coal and Material Prices

Metals—New York	Jan. 20, 1925
Copper, electrolytic, cents per lb	14.75
Copper wire base, cents per lb	17.25
Lead, cents per lb	10.00
Zinc, cents per lb	7.97
Tin, Straits, cents per lb	56.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.30
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.95
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-lb. lots), N. Y., per gal	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1347
Turpentine (bbl. lots), N. Y., per gal	0.93

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Rolling Stock

Durham Public Service Company, Durham, N. C., it is reported, has ordered three Mack railway-type buses.

Richmond Light & Railroad Company, Staten Island, N. Y., has just purchased two double-truck Russell snow sweepers. One was delivered just in time to be of great service during the recent heavy snowfall.

Asheville Power & Light Company, Asheville, N. C., has received five of the 22 new cars ordered some time ago. The remainder will be shipped as soon as possible. All the cars are of the latest one-man type, with up-to-date devices. They are being made by the Brill Company, Philadelphia. Two new buses are also expected by the company for the West-Asheville line.

Track and Line

Coast Cities Railway, Asbury Park, N. J., has been granted permission to install a loop at Cookman Avenue and Main Street, Asbury Park.

Williamsport Passenger Railway, Williamsport, Pa., plans to lay an additional track on Market Street, to install in Markey Square curves connecting Market Street lines; a connecting track to East and West Third Streets; a single track in Washington Street to connect at Market. The new track amounts to almost a mile. Requests are being made to the City Council.

Altoona & Logan Valley Electric Railway, Altoona, Pa., in 1924 used 296 tons of new rails, paved 17,368 track feet, used 1,000 steel and 12,066 wooden ties and renewed 139 poles.

Dallas Railway, Dallas, Tex., during 1924 spent more than $1,000,000 for extensions, improvements, new equipment and paving, and added more than 9 miles of track to its system. Nearly 4 miles of this track represents new trackage, constructed during the year. Of the more than 9 miles of track added, 5.2 miles is accounted for by the taking over of the Trinity Heights line. The new trackage added to the system during 1924 represents a cost of about $200,000.

Asheville Power & Light Company, Asheville, N. C., will build a line from Biltmore Avenue out the Black Mountain highway, a distance of 6 miles. The golf course will lie on one side of the new line and the recreation park on the other. The extension of the railway on the Black Mountain highway, together with the purchase of real estate, will represent an investment of many thousands of dollars.

New York, N. Y. — The Board of Transportation recently directed that bids be advertised for the construction of a portion of the Washington Heights subway route under the proposed Broadway Temple at 173d Street and Broadway. The bids are to be received and publicly opened Feb. 6, 1925.

Intercity Terminal Railway, North Little Rock, Ark., will extend its East Second Street line to the city limits of North Little Rock. Persons residing in the section have agreed to relieve the company of the cost of paving between the rails and 18 in. on either side of the new line.

Shops and Buildings

San Diego Electric Railway, San Diego, Cal., plans to construct extensive new shops. The new building will cover an entire square block and will furnish additional space for machine shops, paint shops, storehouses, carpenter shops and new garages for the buses. Additional space for the storage of heavy road equipment, material yards, shop offices and a lot of new electrical and mechanical devices for the handling of materials and repair work are provided for.

Community Traction Company, Toledo, Ohio, will abandon the Dorr and Galena Streets carhouses on Feb. 1. The Dorr carhouse will be used for storage of inactive cars. The Galena carhouse is in need of repair and will be razed. The abandonment will mean a saving of $15,000 a month in operation of the system.

New Incorporation

Ashtabula & Shore Line Railway, Ashtabula, Ohio, was recently incorporated with a nominal capital of $10,000 by Fred R. Moseley and associates. The company will operate a belt line electric railway, connecting the various steam roads entering the city.

Trade Notes

George E. Doke, engineer of materials and equipment tests of the New York Central Railroad, at New York, has resigned, effective Feb. 1, and has been elected president of the Association of Manufacturers of Chilled Car Wheels, with headquarters at Chicago. He succeeds George W. Lyndon, who died on Oct. 7, 1924. From 1897 to 1900 Mr. Doke served on the Indiana, Illinois & Iowa, now a part of the New York Central Railroad. Later he served on the Lake Shore & Michigan Southern. In 1916, following a consolidation of the Lake Shore & Michigan Southern with the New York Central, he was promoted to assistant engineer of tests in charge of material inspection for the car and locomotive departments of the New York Central system. Four years later he was again promoted to engineer of materials with headquarters at Cleveland, Ohio, in charge of materials inspection and the creation and development of material specifications. Two months later he was made engineer of tests of the New York Central Railroad in New York City. Since 1922 he has served as engineer of materials and equipment tests of the New York Central Railroad.

Roller-Smith Company, New York, N. Y., announces the appointment of W. H. Pugh as its representative in the northeastern part of Pennsylvania, with headquarters at its factory at Bethlehem, Pa. Until recently Mr. Pugh represented the Roller-Smith Company in the territory immediately adjoining Bethlehem, but on Jan. 1 his territory was enlarged. Before Mr. Pugh became associated with the Roller-Smith Company, many years ago, he was superintendent of the Columbia Meter Company at Indianapolis, which concern was later taken over by the Roller-Smith Company.

Norma-Hoffmann Bearings Corporation, Stamford, Conn., announces that its factory and general offices have been moved to a new plant at Stamford. The Long Island City plant is discontinued and all shipments will now be made from the new address.

Massey Concrete Products Corporation has established a district sales office in the Dixie Terminal Building, Cincinnati, Ohio. This district will comprise the states of Ohio, Indiana, Kentucky, West Virginia, and a part of Pennsylvania. W. Lyle McDaniel has been appointed resident manager of this district.

Joseph W. Irwin, until recently president of the Mitchell Spring & Manufacturing Company, Johnstown, Pa., has resigned to become connected with his former associates as general superintendent of the Fort Pitt Spring & Manufacturing Company, Pittsburgh, Pa.

O. L. Chapman has joined the sales organization of the Scott Valve Manufacturing Company, Detroit. Mr. Chapman will devote his time to the application of valves to manufacturing plants and similar lines of industry.

New Advertising Literature

Portland Cement Association, Chicago, Ill., has issued a 300-page volume entitled "History of the Portland Cement Industry in the United States." The book is illustrated and the material is arranged in an instructive way for the layman as well as for the technical man.

Combustion Engineering Corporation, New York, N. Y., has issued a bulletin describing a stoker which its associates in England have installed throughout the British Isles and continental Europe. It possesses several features which are unusual in this country.

Conveyors Corporation of America, Chicago, Ill., has issued a broadside showing the newly designed American monorail cable conveyor. Its corps of engineers has been working on the design of this equipment for several years. The folder contains illustrations.

Sullivan Machinery Company, Chicago, Ill., has just published booklet 126, entitled "You Can Do It Quicker with Air." This booklet has 60 illustrations of rock drilling, concrete breaking, asphalt cutting, digging clay, riveting steel work, drilling wood and metal, sand blasting, spray painting, and other uses of compressed air, and features the Sullivan portable air compressors and air equipment used with them. Bulletin 76-E, "Portable Electric Hoist," describes the Sullivan single-drum and double-drum portable electric hoists at 6½ hp., 2,200-lb. vertical lifting capacity with single line.

Condit Electrical Manufacturing Company, Boston, Mass., has issued a folder describing its type N-4 oil motor starter.

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New York, January 31, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

HARRY L. BROWN, *Editor*

Volume 65
Number 5

Getting First-Hand Information Concerning Quality of Service

ADVERSE criticism of electric railway service is occasioned much more frequently by small things than by really serious shortcomings. Cold cars, windows that cannot be opened or closed easily, buzzers that don't buzz, dirty platforms and stations, abrupt starting and stopping, and annoying little delays at carhouses or fare limits, cause about nine-tenths of the complaints. To the passenger the arrangement of seats is of much greater importance than the type of motor used underneath the car.

In this motorized age, the general manager of nearly every electric railway has his own automobile to take him from place to place, and the use he makes of his own railway is comparatively infrequent. It is the more difficult for him on this account to know exactly what his customers are thinking. An example showing how far a railway official who does not ride his cars may misjudge public opinion is furnished by an operating man, who some time ago sought to "improve the service" by taking out all cross-seats from his cars and putting in longitudinal seats. Whatever gain might have been made in carrying capacity was more than outweighed by the resulting general dissatisfaction among the riders.

On the other hand, some managers make a practice of riding the cars regularly just to get the point of view of the passengers. That is well worth doing. The layman does not and never will understand nor be interested in the major problems of running a railway. These he rightly leaves to the management for solution. But he is interested in the small things that affect his comfort. If these are well taken care of he has a good opinion of the company, but if they are neglected he is antagonistic. It behooves the railway therefore to pay particular attention to such details, however unimportant they may appear.

Tardy but Not Too Late

DOWN East there is a small electric railway struggling for existence. It shall remain nameless, for it is not the property but the circumstances surrounding it that count. Fares had been kicked up and up and up without result in giving more revenue. A charge of $1 per passenger would have done no good. The railway had cut off lines. It had trimmed sail in what it thought was the orthodox fashion. Each time it did so a bus turned up to afford the service which the railway had decided it could no longer give profitably. Not only that, but the buses were not content merely to cover the route discontinued by the trolley. The operators ran into the business districts.

Unlike some other cases, the management has seen the error of its ways. It has begun to study the methods of its competitors, and it is now preparing to modernize and merchandise. In a short time its cars, repainted and refurnished, will glide down the main street through the maze of limousines, vying with them in the degree of comfort afforded rather than being in strange contrast to them in that respect. Moreover, residents who have been accustomed to jump at the shrill blast of an air whistle will take warning hereafter from a siren carefully toned down. It is a small thing, but whistles don't differentiate between patrons and those they are intended to startle. The management knows this now. Another thing, resort is to be made to the use of the bus where it will be of value, particularly because the railway management has become convinced of the versatility of that vehicle. In this case, as in so many others, the bus operators were not more formidable; they were just a trifle more resourceful. They are to be met now on their own terms, with the prospects all in favor of the electric railway with its co-ordinated operation.

Sectional Associations Cultivate Broader Thinking

ONE of the most important functions that may be performed by sectional associations is that of helping to bring men up for the job ahead. This was one of the principal objects in the formation of the Mid-West Electric Railway Association, as expressed at a recent meeting of that association by F. G. Buffe, general manager Kansas City Railways. It was pointed out that the association hoped to encourage department heads and their assistants to take part in the discussion of some of the broader problems of the industry.

Undoubtedly, the programs and procedure for such meetings should be planned with this object in view. Such plans should receive the wholehearted support of the managements of member companies to the extent not only of encouraging department heads to take part in the discussion of subjects of general interest, but of urging them to do so. The average department head is far too prone not to be interested in subjects outside of his department specialty. This applies particularly to technical men as a class. They tend to overlook the broader aspects of their industry and to become so absorbed in the specialized work of their respective departments as to lose sight of the problems of transportation as a business.

Association work offers an opportunity for broadening the viewpoint of men down the line. At sectional association meetings, time for full and free discussion can be made available. Thus in addition to its function of taking up questions of local interest to the member companies, the sectional association may perform the very useful purpose of helping to bring men up for the job ahead.

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Neglected Publicity Opportunities in the Smaller Cities

EVERY town large enough to have an electric railway has at least one hotel. Somewhere in the lobby of this hotel will be found a time-table rack displaying advertising folders of various railroads, steamship lines, hotels in other towns, intercity bus lines, and the like. But it is seldom that one sees any electric railway publicity matter in such a place. Unfortunately, this is usually not because these folders are so much in demand that the supply has been exhausted, but rather because the railway management does not take the trouble to furnish them.

This important field of publicity endeavor has been neglected by a majority of the railways in the moderate size towns. There are, of course, a number of companies which have done good work along these lines, but they are the exceptions. Many of these exceptions merely supply time-tables, missing the opportunity for something more attractive and having more selling appeal. This is a field well worth cultivating.

A large number of the hotel guests are potential patrons of the electric railway. In summertime some of them may be transient automobilists, but for the most part they are strangers with no private means of transportation. To get around the town, or to leave the town, they must either walk, take a taxi, ride a bus, the trolley or steam railroad. When no effort is made to familiarize them with the railway service, it is hardly surprising that many choose the steam railroad, taxi or bus.

The average man likes to plan his movements ahead of time, and wants to have information available which will permit him to do so. Moreover, he is naturally disinclined to ask questions. If he can pick up a folder giving the routes and schedules of the electric railway and study them during his spare time, he is much more likely to use the railway than if considerable effort is needed to find out where and when cars run.

Designing Cars to Please the Public

THE demand for changes and innovations in transportation is being repeatedly emphasized in the discussions of railway men generally. One subject where this is particularly noticeable is in the design of electric railway cars, which was the subject of several papers before the New York Electric Railway Association last week. Though modern electric railway cars are a decided improvement over most of the cars built 25 years ago, they are not radically different in their general appearance. The bus, on the contrary, gives the public an impression of being a new type of vehicle, designed along new lines, and capable of being operated in a new way. Hence it has a special appeal to a certain element of the public as something novel and radically different from that to which the riders have been accustomed. Inherently, any difficulties that may be attached to the task of improving the appearance of transportation vehicles are greater in the case of the bus than in the railway car. Consequently, there seems to be no good reason why marked improvements in the appearance of cars cannot be made so that an important passenger-attracting factor will be added. Why not, then, design with an eye toward that distinctive appearance and element of novelty that creates a natural desire to ride on the new vehicle—and perhaps couple that design with a new kind of service?

Some progress in this direction has been made in some of the cars described before the meeting. The Illinois Traction car, for instance, was worked out with the particular thought of pleasing the traveling public. More comfortable seats, better heating and ventilation, better toilet facilities, easier ingress and egress and a pleasing appearance, both inside and out, have all contributed to the success of the new cars. Their light weight and low operating cost have also made it possible to couple the novelty of the design with a new type of service, in which better headways are given and high speeds are maintained.

The result was easy to foresee—receipts have increased, according to Mr. Bosenbury, who prepared the paper. This is the most substantial way in which the public finally voices its approval of the new car and the improved conditions that it has brought about.

Give Chicago Voters a Fair Choice

INCREASED attention is being attracted to Chicago as the discussion of its local transportation situation progresses. With the time of expiration of the existing surface lines' franchises now only two years off, an attempt is being made to work out a comprehensive plan that the voters will accept, which will provide a unified transportation system, and which will permit extensions and improvements to be made as needed.

Two major plans have been made public. One originated with the Mayor and his advisers; the second with Henry A. Blair, president of the Chicago Surface Lines. A third proposal by Samuel Insull offers immediate extension and improvement of the elevated lines, but does not make any provision for inclusion of the surface lines as a part of a comprehensive system.

All of the physical plans include the construction of subways in the congested business district. A general similarity appears as to the remainder of the two major physical plans. There is, however, one important difference between the views of the Mayor and Mr. Blair. The Mayor maintains that it will be impossible to grant a franchise for a long enough period to enable extensions and improvements to be privately financed. He has endeavored to work out an arrangement under which the city can purchase its transportation facilities by the issuance of so-called Swartz certificates—a lien on the income of the properties. Mr. Blair, on the other hand, maintains that private ownership will insure freedom from political management and that a franchise permitting a comprehensive plan to be financed would be approved by the voters provided that the subject were fairly presented.

So far, the Mayor has shown no inclination to put the subject squarely before the voters. A referendum will be held, as it is necessary under the law. But the Mayor's program, as disclosed so far, contemplates putting the city purchase plan alone on the ballot.

It is generally considered that Chicago's Mayor is sincere in his views of the local transportation problem. In that the city is more fortunate than under the former administration. But a sincere effort to secure the best transportation plan would mean at the least putting both the Mayor's and Mr. Blair's proposals on the ballot. Instead of this the Mayor would ask the people to say "yes" or "no" to one plan only. Acceptance means municipal ownership; refusal is generally considered to mean a receivership or long delay in improvements.

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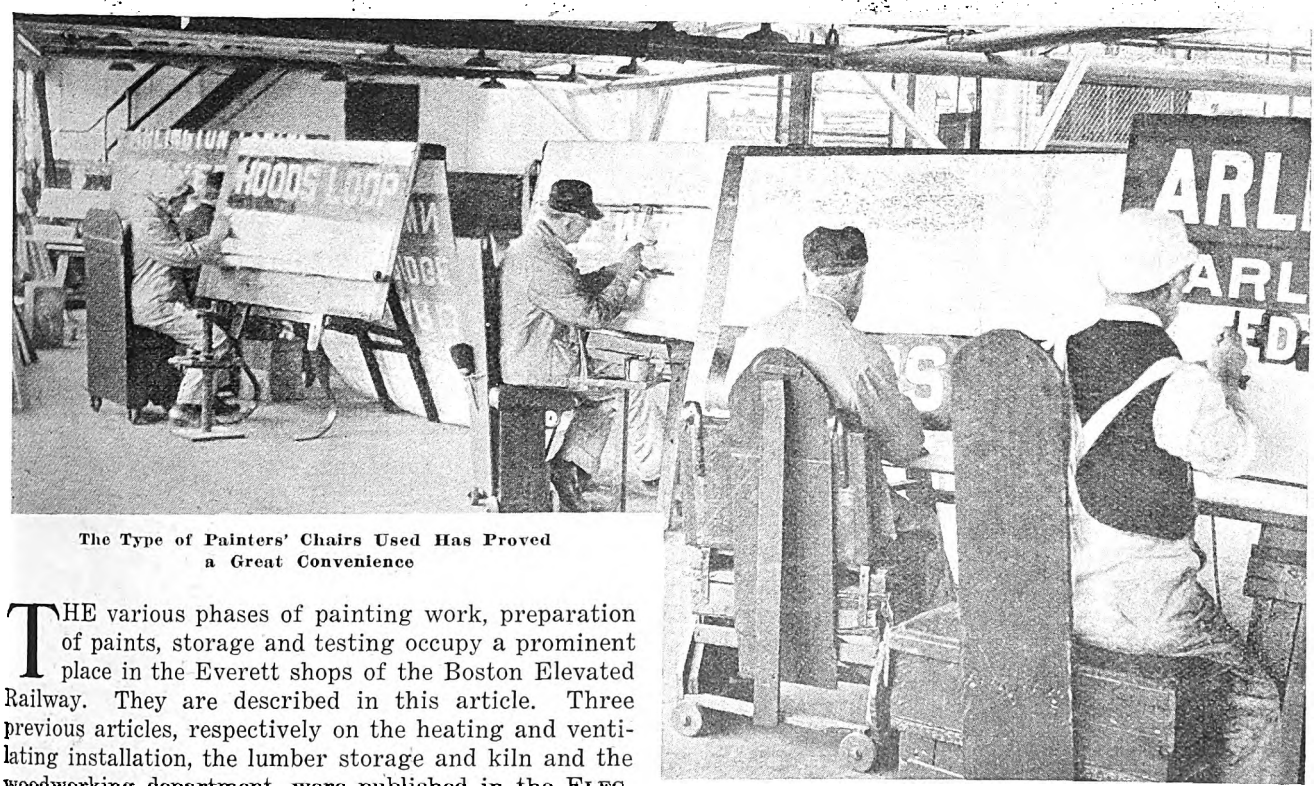
Modern Painting Methods Used in the Everett Shops, Boston

Fourth Article

Many Types of Modern Motor-Driven Equipment Used for Paint Preparation Include Paint, Enamel and Putty Mixers, Pebble Grinders and Lead Cutters—Very Complete Facilities for Paint Storage—Records of Paint Tests Kept—Procedure Followed in Painting of Cars, Signs and Various Fittings Is Described



The Type of Painters' Chairs Used Has Proved a Great Convenience

THE various phases of painting work, preparation of paints, storage and testing occupy a prominent place in the Everett shops of the Boston Elevated Railway. They are described in this article. Three previous articles, respectively on the heating and ventilating installation, the lumber storage and kiln and the woodworking department, were published in the ELECTRIC RAILWAY JOURNAL for Nov. 22, Dec. 13 and Dec. 27.

The paint shop is of the same general design from the building standpoint as the wood mill. It has 22 tracks available for car painting, with space for handling 52 surface cars of the largest type operated on the system. The floor is of reinforced concrete, finished with a surface treatment to keep down dust. Between the rails are drains in the floor to take care of the drippings from the cars. The floor, however, is practically level, to facilitate the operation of traveling painting stagings. The small amount of water coming in is taken care of by sweeping it into the drains.

Special provision has been made in this building, as in the others of the Everett group, for adequate toilet facilities. Urinals in the centers of the painting spaces are concealed with small screens. Thus the men do not have to walk any great distance. Excellent lavatory facilities are also furnished.

A thoroughly modern paint mixing and stock room is located on the ground floor, with a complete and well arranged layout of slate shelving for storage and motor-driven machinery for mixing paint and making putty. Adjoining the paint storage is a glass department, where glass is stored in cases, according to size, and so distributed as to be available at all times. The south end of the paint shop floor is assigned to the painting of trucks and buses. Beneath the paint stock room is a basement containing supply tanks from which turpentine, oil, varnish, etc., are pumped for delivery inside the storage room.

A balcony extending over the paint and glass storage rooms is connected with the ground floor by an electric elevator. This balcony is devoted to sign painting, locker rooms, shower baths and the office of the superintendent of the Everett shops. In this building the height from the top of the rails to the under side of the roof trusses is 20 ft. and the bays are 32x44 ft. The skylights were designed with the lower half stationary and the upper half movable. It was found that sufficient ventilation could be had in this way, with the operating mechanism kept at a minimum. As in the wood mill, the operating sash are moved by motor-driven equipment controlled by push-buttons from the first floor. About 150 ft. of sash can be handled satisfactorily in a run from a single motor.

The paint stock room, about 63 ft. long by 39 ft. wide, combines preparation and storage functions and is exceptionally well equipped with power-driven machinery. Three fire doors in the wall separate this section from the paint shop interior proper, another fire door on the north side leads into a stock room for dry colors and a fifth fire door opening into a driveway on the east

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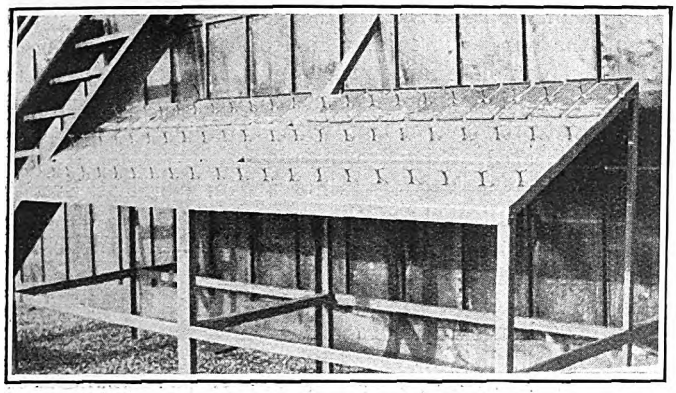
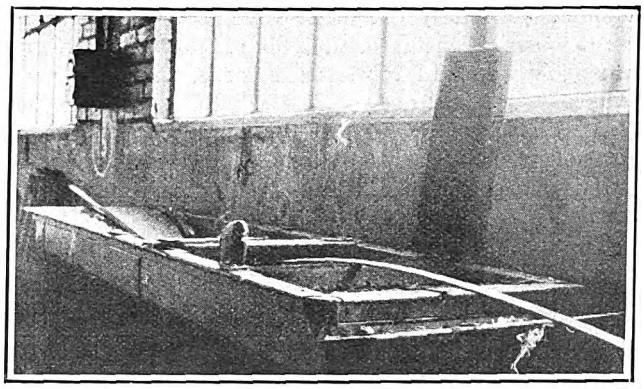




At Left, Test Rack for Paints. After Attaching Panels to Rack, They Are Exposed to the Weather. At Right, Method of Feeding Beading Through Staining Tank

side of the building is used by motor trucks in delivering supplies to the paint storage section. The handling of materials has been simplified by this door arrangement. Barrels of turpentine, linseed oil, driers and varnish are rolled off the trucks by hand and skidded into the stock room. These are then rolled over to the west side of the room, tilted upon cradles equipped with sieves and discharged into basement storage tanks through floor funnels terminating in short pipes feeding the tanks below. Racks for the storage of containers are also provided in the stock room and in the basement, these raising the containers above the floor about 12 in. to facilitate tapping.

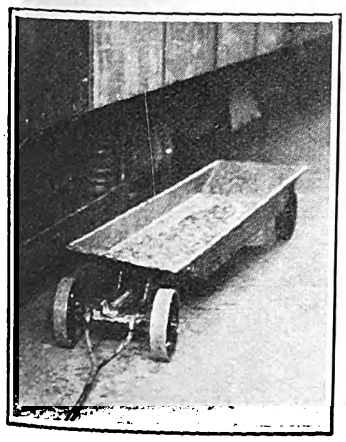
On the west side of the stock room is a battery of 11 hand-operated self-measuring Milwaukee pumps connected with the basement tanks and discharging into receptacles as required in the stock room. Nine of these tanks are in the basement, but to give fire protection a 500-gal. tank for the storage of gasoline and another of the same size for the storage of alcohol are placed underground below the driveway. These are filled from tank trucks by outside hose connections, and the liquids are drawn through pipe connections leading through the stock room basement to the tank outlets.

Containers for soluble oil, orange shellac, white shellac, paint remover, "cotelac" and electric car oil are racked on the east side of the stock room. These materials are used in color mixing and thinning and for lubrication.

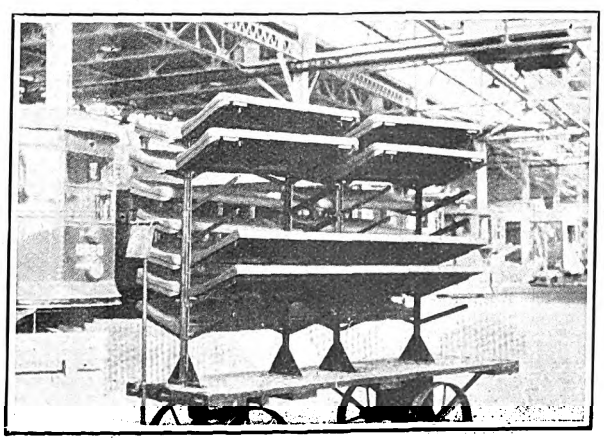
In this shop the method of mixing or agitating has been carefully worked out. Most of the machinery in the stock room was designed and built by the J. H. Day Company, Cincinnati, Ohio. Economy of labor was kept in mind at every stage. Centrally located is a group of three agitators served by removable containers holding 80 gal. each. These containers are kept in the stock room on the east side just beyond the color mixing and thinning section and hold bronze-green truck paint, zinc-white floor paint, lead-colored roof paint and bunter white. The battery of agitators is driven by a 5-hp. motor mounted on the ceiling. Each agitator is belted to a central overhead pulley chain-driven from the motor pulley. Idler pulleys for each agitator enable any unit to be cut out of service independently. The containers used with these agitators are mounted on wheels to facilitate rapid placing and removal. The mixers are so arranged that the operator can grind his color material into the requisite can, roll the container to the mixer and either thin down or tint for use as necessary.

Beyond the east door of the paint stock room are located a white-lead cutter, a 350-lb. putty mixer and a steam-jacketed kettle for breaking down and recovering paint skins from pots, etc. The lead cutter, a 50-gal. "Hero" mill, is used in breaking down and mixing heavy pastes preparatory to their grinding and thinning. This machine is driven by a 5-hp. motor with starting switch on the mill frame. Next is a 350-lb., 48-in. putty chaser, group-driven with a 50-gal. kettle from a 3-hp. motor mounted overhead. At the north end of the room are a 20-gal. pebble mill, an 80-gal. orange shellac cutter and a similar one for white shellac, group-driven by a 5-hp. motor which also drives three water-cooled mills in group. Any one of these six machines can be cut out of service by a clutch without interfering with the others.

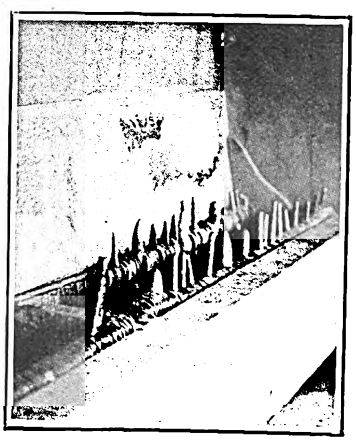
The pebble grinder is a No. 7 Abbe mill with Silex lining. It is specially designed to keep the material out of contact with the outside air and is particularly valuable where the thinner is volatile and must be



Hopper Truck for Receiving Paint Scrapings



Hand Truck with Racking to Hold Seats and Backs for an Entire Car



Brushes Are Held by Spring Clips in a Water Tank

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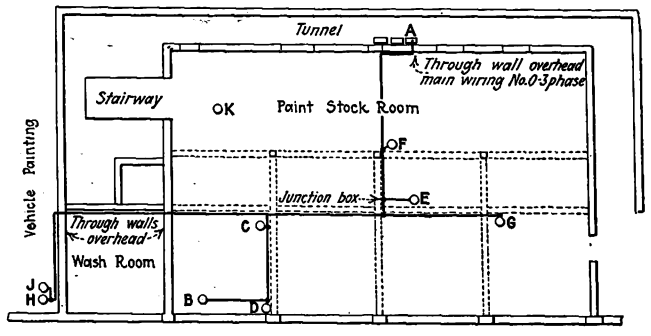
confined absolutely during the grinding process. The three 15-in. diameter color mills are arranged in gang to enable one mill to be used for a particular color, thus saving cleaning and the possibility of discoloration which sometimes results where a mill is employed for several colors. The stones are dressed for color grinding and the mills are used extensively in the preparation of delicate coach colors.

Three 200-gal. Paragon mixers group-driven by a 5-hp. motor in the center of the stock room are used in thinning down and tinting paint produced in quanti-



Wiring Layout for Motors and Ovens Used in Paint Stock Room, Everett Shops

ties and are each provided with a clutch for separate operation.

Between the pebble mill and the pump and serving shelf section of the paint stock room is a battery of 10 10-gal. enamel mixers group-driven by a 5-hp. motor. Each has an independent clutch. These mixers are assigned to the following enamels, keeping each intact for one kind of material—outside car green, inside light green, inside dark green, outside pullman, inside white, outside white, cherry, outside black, black baking and orange. A portable "Revolvator" driven by a 4½-hp. motor is in service in the paint shop.

The tank installation in the paint stock room basement consists of seven 50-gal. tanks assigned to compressor oil, machine oil, compensator oil, kerosene, lard oil, lacquer and lacquer thinner, two 300-gal. tanks for japan and driers, five 500-gal. tanks for finish varnish (3), black varnish (1) and rubbing varnish (2), and two 1,000-gal. tanks for linseed oil and turpentine. The tanks beneath the self-measuring pumps are equipped with floats connected through chains to indicators beside the pumps in the stock room.

Motor Drive Keeps Stock Room Clean

A major factor in the selection of the motor drive for the machinery in the paint stock room was the elimination of the extensive amount of belting and shafting so generally associated with this class of work. This virtually does away with the throwing of dirt and flaky scales and helps in the preparation of purer colors. The use of induction motors also does away with the objections common to direct-current commutators. In general, the motor starters in the stock room are mounted on columns adjacent to the controlled machine units and the wiring is carried in iron conduit. In addition to the complete automatic sprinkler installation, the paint shop is equipped with chemical extinguishers and a private fire alarm box, with standpipe and hose centrally located.

A great variety of paints are prepared at Everett for use in all parts of the system. A few of the more important preparation jobs are described in the following paragraphs:

Putty is made up in the mixer in batches of 350 lb., about 4 hours being required. Red putty is made by mixing 330 lb. whiting, 25 lb. oil lead, 7 gal. linseed oil and 10 lb. dry Venetian red. The last ingredient is omitted in making white putty. The red putty is used largely in setting sash in cars with cherry trimmings, the white being used mainly in setting sash outside buildings. In the mixer the putty is rolled by a 900-lb. steel wheel, whereas by the old hand methods only 25 lb. was kneaded at once.

Semi-white lead paint is used largely around stations. In a typical batch about 575 lb. of white lead is broken up for an hour in the lead cutter, and with 3 gal. of linseed oil and 15 gal. turpentine the mass is agitated in one of the 200-gal. tank mixers for 4 to 5 hours, the necessary colors being added during the latter process. The paint is then drawn as required from the agitator tank.

Structural gray paint is used largely on the elevated structure. About 1,200 lb. of white lead is prepared in the lead cutter. Zinc white, ground in oil in the water-cooled mills, is added to the white lead and made into a paste. To this are added 400 lb. of French yellow ochre ground in oil and 60 lb. oil lampblack; 70 gal. of linseed oil is then added, the proper colors having been added during the grinding process in the 200-gal. agitators. The paint is served as required from the agitator tanks.

Dry red lead is hand-mixed into a batter with oil and thinned with turpentine and driers. It is then delivered over the counter to the painters.

The ground color used as a base for orange enamel consists of white lead, red lead and golden ochre. They are mixed and thinned with turpentine and drier to form a flat color. About 60 gal. is mixed at one time in the agitators near the pebble mill and drawn off as required. Lead color, used on trucks as a base for green enamel, consists of white lead mixed with lampblack in oil and thinned with turpentine and driers. The mixing is done in the same agitator battery.

Surface car gray roof paint is an oil paint consisting of white lead mixed with oil lampblack and thinned with linseed oil and driers, with the addition of a small quantity of turpentine. The paint used for elevated car roofs is an oil paint consisting of white lead and French ochre in oil mixed with Venetian red which has been ground in oil in the agitators. This is thinned with linseed oil and driers. Plow paint is made in the

PAINT STOCK ROOM MACHINES, MOTOR DRIVEN

Ref. Letter	Description of Unit	Manufacturer	Hp.	Manufacturer	Type	R.P.M.	Control Information
A	200-amp. safety switch						
B	Puttychaser, 48-in.	J. H. Day Company	3	G.E.	KT 938	1,200	CR 1,038 G.E.
C	Three heavy-duty mixers	J. H. Day Company	5	G.E.	KT 946	1,200	CR 1,038 G.E.
D	50-gal. white lead mixers	J. H. Day Company	5	G.E.	KT 946	1,200	CR 1,038 G.E.
E	80-gal. portable mixers	J. H. Day Company	5	G.E.	KT 946	1,200	CR 1,038 G.E.
F	Ten 10-gal. portable mixers	J. H. Day Company	5	G.E.	KT 946	1,200	CR 1,038 G.E.
G	Paint grinder	J. H. Day Company	5	G.E.	KT 916	1,200	CR 1,038 G.E.
H-J	Electric ovens						
K	Revolvator		4½			1,800	Trumbull switch, 150-volt, 30-amp.

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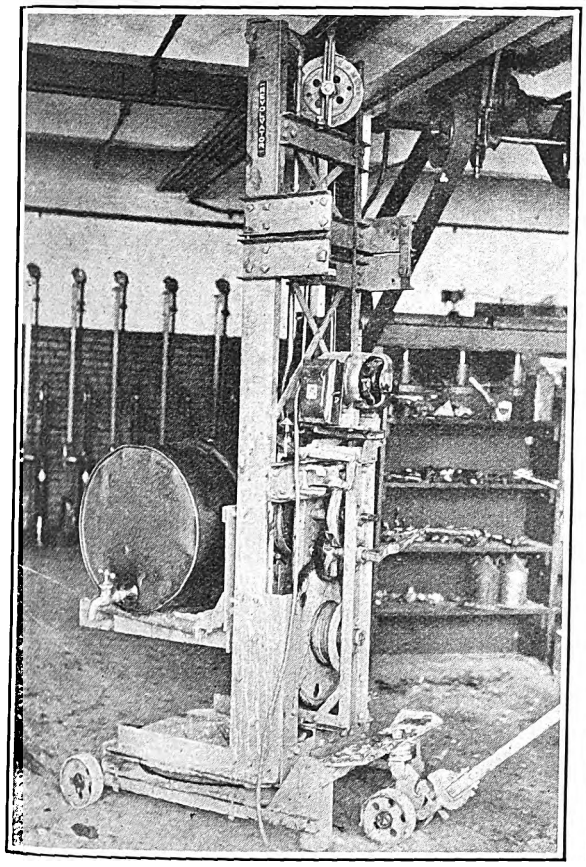
same way except that burnt sienna is used in place of Venetian red.

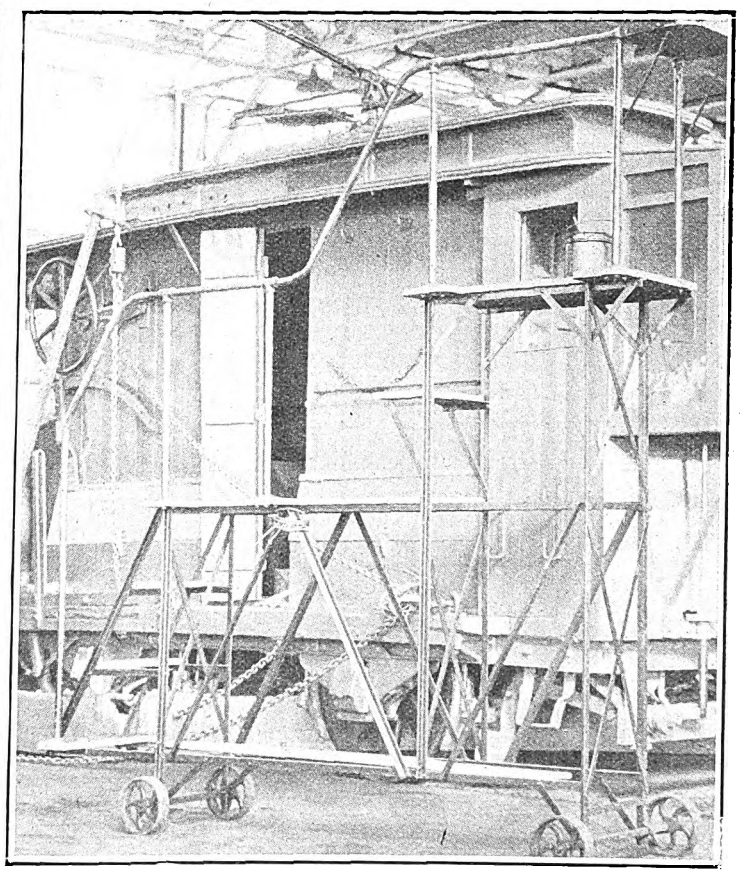
Cherry ground paint used on doors, sash, etc., as a base for enamel consists of white lead and burnt sienna mixed by hand and thinned with turpentine and drier. Bronze green used on service cars, coal cars, derricks, etc., is broken up in oil in the mills above mentioned and drawn for use.

Elevated car paint consists of white lead colored with raw umber, hand-mixed. This forms the basic color for the Pullman car enamel used on the outsides of the car bodies. On the insides of these cars white enamel and two shades of green enamel are used, the basic ground paint being white lead and green, thinned with turpentine and drier. All cars on the system are painted with white enamel on the insides of the roofs.

Truck paint is prepared by first boiling skins scraped from pots in a steam-jacketed kettle. Linseed oil is gradually added. After straining, 150 lb. of white lead is added to each 25 gal. of boiled skins to give the necessary body. This is done in the agitator tanks and lampblack and umber are added, thinning with linseed oil and turpentine to obtain the proper consistency.



Revolvator Used in Paint Stock Room



Scaffolding Mounted on Wheels for Painting Exterior of Cars

CARS ARE BEING REPAINTED ORANGE COLOR

At present the railway is repainting its surface cars orange for the sake of increased visibility over the previous standard dark green. This work will probably take three years. About four days is required to repaint an average car. The car is thoroughly cleaned, scraped and sandpapered, stripping to the bare metal or woodwork. A chemical paint remover is used where necessary. Nearly three-fourths of the cars are steel units. The paint is scraped into a hand truck equipped with a detachable hopper from which the paint refuse is later emptied and burned. Bare metal is given a coat of red lead and wood is primed with a light-colored lead primer. Holes are puttied and dented spots looked after. The roof is painted a battleship gray and the main body coat is applied. This kills the green color without changing the color of the finish coat. When the main body coat is dry an enamel coat is put on the body and sash. While in some cases the enamel is the final coat, it is customary to finish with a varnish coat in order to increase the life of the enamel. The numbering and lettering follow the finish coat.

While the exterior is being painted, the repainting of the interior is in progress. As a rule this includes only the sash, doors and headlining, the rest of the work being varnished. The conductor's stand, brake staff and air piping are blacked off and usually the floors are given a heavy coat of dark gray oil and lead paint. The ceiling is washed and touched up with white lead and enameled. The trucks are given one coat of dark gray paint while the body is in hand. After the last coat is put on and is dry the glass is cleaned and the brasswork, seat backs, seats and screens are put in place. Small hand trucks, one for each car, are used to hold the entire set of seats. These trucks are of the flat platform type with racks built of 1-in. x $\frac{3}{16}$-in. angles. Screens are dipped in a tank near the south end of the shop and if any enamel baking is required two electric ovens are available.

One man is assigned to roof painting and at the same time two men clean the car body and apply the priming coat. The roof dries in about 24 hours and the car body from 24 to 48 hours. Two painters then enamel the body and one enamels the sashes. Forty-eight hours later two men varnish the body, sash and doors. One man paints the trucks with one coat, which dries in about 24 hours. On the car interior three men are usually required.

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Three electric ovens are being used in baking enamel at the Everett shops. These were designed and built by the Oven Equipment Company, New Haven, Conn., electrically equipped by the Westinghouse company, and with Bristol temperature control. One 33-kw. and two 10-kw. ovens are in use. One of the latter is in the temporary machine shop and the two others are in the paint shop near the paint stock room.

The larger oven is designed to accommodate a car truck. The outside dimensions are 8 ft. wide, 7 ft. 6 in. high and 7 ft. deep. Heaters are placed on the side walls and are covered by screening to prevent damage by contact. A motor-driven blower and duct system above the heaters circulates the heated air through the oven. The motor and fan are mounted on the roof. If desired, the oven may be moved on rollers as a unit or taken down in sections and transported to another location without injury to the insulation. This oven is used chiefly for baking enamel on automobile hoods, mud guards, fenders and other large pieces. About 10 minutes' baking at the maximum temperature of 365 deg. F. is required.

The smaller oven in the paint shop is used chiefly in baking enamel on light work. Hand strap brackets and conductors' seat stands are ordinarily baked an hour at 350 deg. and tin cases for car signs 10 minutes. Car springs are also enameled in this oven, one hour at 350 deg. being required per batch.

Car screens are dipped once each by hand in a tank of Watertown black and dried on a rack in the paint shop. A tank is also provided here for washing and bleaching car seats with oxalic acid. Used sign cloths are passed through the washing tank and are then used as old rags. A tank with a roller is provided for coating canvas with lead paint. Three men can put through 650 yd. in an hour, compared with three weeks by the old methods of hand painting.

Beading is run through a staining tank 27 in. wide and 8 ft. long, mounted about 3 ft. 6 in. above the floor and equipped with hinged wipers of plush, each about 6 in. wide and 1½ in. thick. These wipers are clamped in pairs to the top edges of the tank. The beading strips, a dozen or more at a time, are dipped in the stain solution and pulled through the wipers by hand. At least twenty times the length of beading can be stained in this way per hour as was possible with the old methods of brush coating.

The sign painting section occupies a rectangular space on the balcony above the paint stock room, 75 ft. long by 35 ft. wide. Most of this work is done by hand except where several hundred small signs bearing the same designation are required. In the latter event, the silk stenciling process is used. Signs like "Enter at Front" and "No Smoking" are stenciled when required in quantities.

The eight easels provided for sign painting are used very extensively for painting Hunter signs, which the company has used for many years. The chairs are mounted on rollers to enable the painter to change position without rising. To keep the knees from striking the easel supporting leg and to enable the painter to move sideways without "hitching" his chair backward, the easel legs are curved inward, these legs being of 2-in. x ½-in. straps.

In painting Hunter signs paper patterns are used to outline the lettering and then the surface of the cloth is painted black around the letters, leaving these white. Patterns are stored in a portable rack made of 1½-in. angles. It is 5 ft. 6 in. long, 4 ft. high and 2 ft. wide and has 11 shelves. The shelf bracing is of 1-in. angles and the rack easily will hold 2,500 "pounce" patterns of drafting paper. Hunter signs are rolled out flat on the floor in drying. From 6 to 8 hours is required to paint a 26-exposure Hunter sign and dry it.

These Hunter signs are painted on Holland linen and are given one coat of "Hunter sign black." This is made up in 17-lb. batches composed of 10 lb. oil lampblack, 5 lb. Prussian blue, 1 qt. linseed oil and 1 qt. flex compound. If necessary signs can be painted with "drop black" and dried in about 2 hours. Tin signs are usually given two coats of lead paint and after lettering one of varnish. Sheet-iron illuminated signs are given two coats of black enamel and two coats of white lead for lettering. About 2 days is required for these signs. Miscellaneous wooden signs are hand-painted with two coats of white lead and one of enamel, the lettering being of drop black.

Sampling and Testing Paints

A convenient record of paint samples is kept in a series of slotted drawers in the paint stock room office. These drawers or sample boxes are of ½-in. whitewood and are each 11 in. long, 4½ in. wide and 5½ in. deep and are provided with inside vertical slots $\frac{3}{16}$ in. wide and deep, spaced ½ in. apart. Each pair of slots holds a plate of white glass 5 in. square and ⅛ in. thick and each plate carries a paint sample with a paster card giving the data upon the former. Each drawer holds 14 plates and a cabinet is provided with a capacity of 30 boxes.

A testing rack for paints and enamels has been set up on the roof. This is of metal, 10 ft. long by 3 ft. 4 in. wide, with inclined plane surfaces carried 30 deg. from the horizontal and fitted with spring clamps by which the sheet-iron test plates can be fastened to the flat surface. There are three panels or flat test surfaces separated from each other by 1¾-in. gaps for drainage and for hanging the test plates in place. The test plates are 11¾ in. long by 5 in. wide. The ends are looped over to form an L-shaped piece, which helps keep the test piece in place in all weathers. The rack will hold 66 plates and faces the south. It is made with a frame of 1½-in. angles for uprights, with 3-in. upright channel braces in the center and is 4 ft. 4 in. high at the back and 3 ft. high at the front. The clamps for these test pieces are made of ¼-in. brass pipe split at the ends and threaded inside to receive a bolt and spring under the testing surface. The clamps rest on ⅝-in. x ¾-in. rubber feet to prevent electrolysis. Holes drilled in the test plane receive the bolts holding the clamps in place and the rack is provided with metal feet about 3 in. square and is braced to a wall and stairway.

Twelve portable scaffolds are used for car painting. Each is about 8 ft. long, 15 in. wide and 9 ft. high. There are two platforms at different levels connected by four steps. These are carried on a frame of 1-in. angle irons and fitted with ⅞-in. pipe railings, as shown in the illustration. The structure is mounted on four 8-in. diameter cast-iron wheels with a 2-in. tread. The difference in height between steps is about 1 ft. so that the painter can easily reach any part of the car body. He can propel the entire scaffold forward or backward without descending to the floor level. An 18-in. x 10½-in. shelf at the top carries supplies for the roof painter, and the steps can be used as platforms or for carrying supplies.

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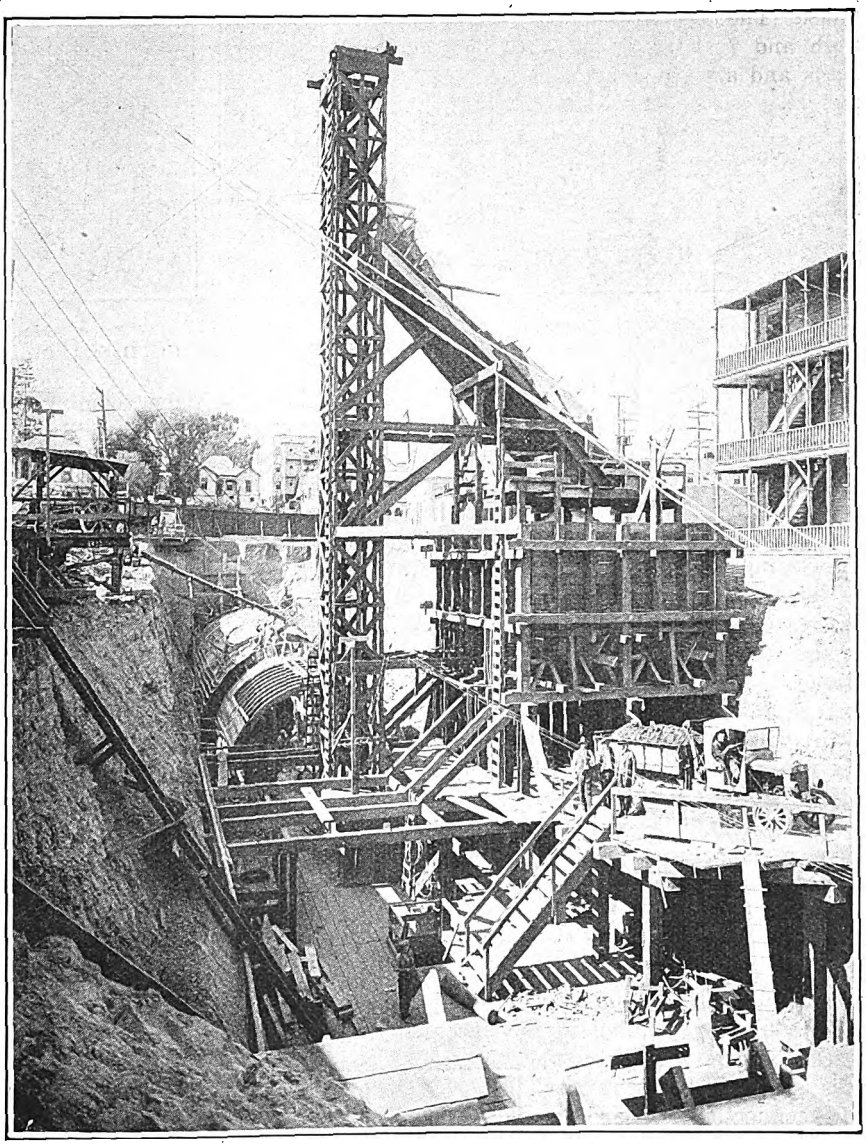
Sub-Surface Terminal for Los Angeles

Plans for Hollywood-Glendale-San Fernando Valley Subway, Now Under Construction, Have Been Altered to Include an Underground Terminal Station in a New $4,000,000 Building for the Pacific Electric Railway—Provision Will Be Made for Other Subways Planned for the Near Future

INSTEAD of a surface terminal at Hill Street, Los Angeles, for the Hollywood-Glendale-San Fernando Valley subway, now being built by the Pacific Electric Railway, the plans have been changed to call for the construction of a sub-surface station in the basement of a large new terminal building. The former plan, which was briefly described in ELECTRIC RAILWAY JOURNAL for Sept. 6, 1924, called for five loading and unloading tracks at the street level, together with platforms and other station facilities. Under the new plan the sub-surface terminal will have the same number of tracks, but will be entirely below ground. An additional expenditure of about $500,000 will be necessary.

Authorization for the change was made on Jan. 5 of this year by the California State Railroad Commission. As a result it is expected that the tunnel will not be completed until Oct. 1, instead of next March. The feasibility of connecting the subway now under construction and the new terminal with a general subway system for the city was an important factor affecting the decision to depart in this way from the original plans.



Waste Is Here Lifted from the Subway Level and Deposited in the Bunker, from Which Motor Trucks Haul It Away

PROGRESS OF SUBWAY DIGGING IS RAPID

In order to complete the new subway in record time, the work has been carried on in three places. After starting the initial bore eastward from First and Glendale Boulevards the contractor then began to dig both east and west from a section temporarily opened up between Flower and Figueroa Streets. Three shifts totaling 650 men are employed. During December progress on the three bores totaled 780 ft. This was an average of about 30 ft. per working day. The placing of the concrete lining was accomplished at approximately the same pace.

Excavated material is hauled out of the subway in small cars operated over a light railway. By this means it is brought to the foot of a hoist, which raises it and drops it into a bunker just below the street level. From this bunker trucks haul the soil away. Arrangement of apparatus for doing this is shown in the accompanying illustrations.

Conditions of soil so far encountered have been favorable for progress except for the presence of a certain amount of water. Emergency timbering at locations where water was encountered, however, has enabled the work to proceed without interruption. On the basis of 4,250 ft. of actual tunneling to be done the excavation and placement of reinforced concrete on Dec. 1 was approximately 71 per cent complete, a total of 3,040 ft. having been dug. There remained some 500 ft. of difficult going eastward from Flower Street to the Hill Street station. It is expected, however, that the actual digging will be completed in the spring, although the construction of the terminal building and approaches will postpone the completion of the entire project until some time in the early fall.

Following the decision of the Railroad Commission in the matter of changing the grade of the subway terminal, it has been decided to erect a large $4,000,000

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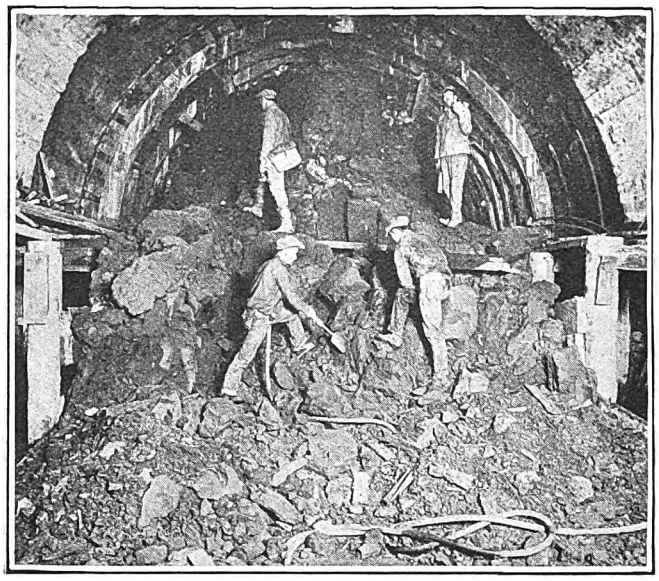

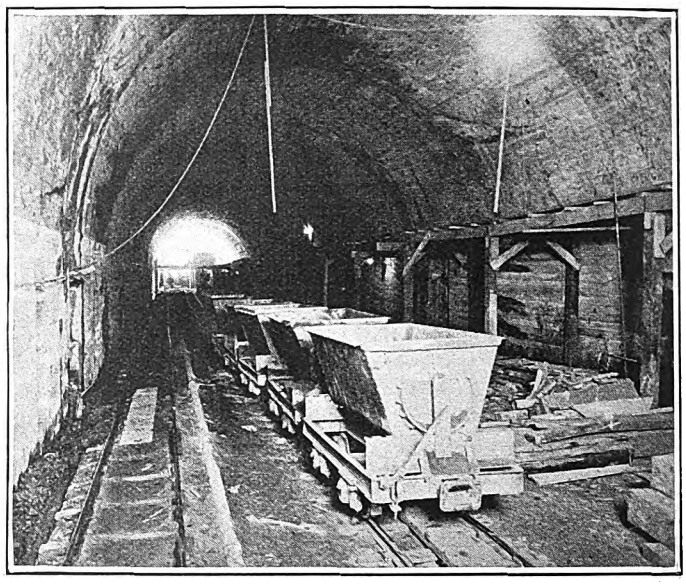

At Left—By Working 24 Hours a Day in Three Shifts the Railway Has Been Able to Dig the Subway at a Speed of About 30 Ft. a Day. At Right—Excavated Material Is Carried from the Bore to the Foot of the Hoist by a Light Railway

terminal building on the site of the Pacific Electric Railway's present Hill Street building. The exterior of the new terminal will be of granite and terra cotta. Schultze & Weaver, Los Angeles and New York, are the architects. Leonard Schultze, who prepared the plans for the new Los Angeles terminal, also designed the Grand Central Station in New York City.

Reinforced concrete construction will be used for the new building, which will be 12 stories in height. Space for 600 offices will be provided. The main entrance to the building is from Hill Street, leading to an arcade 130 ft. long and 30 ft. wide, with shops on both sides. There will be eight passenger elevators, six at the Hill Street entrance and two on the Olive Street side. On this side there will also be a garage to accommodate the automobiles of the tenants. It will have a capacity for 128 automobiles on two floors. Direct entrance will be had from Oliver Street to both floors. The fact that the basement of the building is to be used as a railway terminal necessitated the location of the fire room above the street level, which presented some unusual problems in building design.

The subway terminal in the basement will have five tracks, accommodating 30 cars. Six inclined ramps will connect the boarding and alighting platforms with the first floor, where the waiting room and ticket offices will be located. The ascent will be broken, however, by a mezzanine floor with a smaller waiting room between the track and the street levels. The railway estimates that 50,000 persons a day will use the new terminal upon the completion of the subway now being built. This number will be greatly augmented when other subways are dug and connected up.

The first subway to enter the terminal will be the one now nearing completion, which will serve the northwest part of the city. This $3,500,000 project will take the Hollywood, Glendale, Santa Monica via Sawtelle and San Fernando Valley cars off the streets in the congested districts. When future traffic needs make necessary a subway specially to serve the Santa Monica Bay district the building will be enlarged to take care of this development.

New Terminal Building of the Pacific Electric Railway in Los Angeles Means the Realization of a Dream Originating with the Late E. H. Harriman

Location of Interurban Terminal Will Stabilize Business District

It is thought that the decision to build the subway terminal in this location will be far reaching in its effects. It means the stabilization of the present central business district, the status of which has heretofore been somewhat uncertain because of the tremendous growth of the city. This has been unrestrained by any definite plans of development, particularly in the business section. Experience in large Eastern cities is considered to have demonstrated the fact that a constantly shifting business center is detrimental to the best interests of the city. The location of Los Angeles' first subway terminal on Hill Street and the decision to create a civic center not far away are expected to have an important influence in keeping the main business district centralized.

The construction of this new terminal means the realization of a dream which originated with the late E. H. Harriman more than 20 years ago. At that time Mr. Harriman even went so far as to have plans prepared for a large office and subway terminal building on this same site. While the present plans differ from his in many ways, the idea followed in its construction now is the same as then.

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Service Readjustments Would Increase Atlanta Earnings $700,000

Beeler Report States that Elimination of Jitneys and Rerouting of Street Cars of Georgia Railway & Power Company Would Increase Railway Revenues and Reduce Operating Expenses—Relocation of Car Stops Would Speed Up Service — Co-ordinated Railway and Bus Operation Is Recommended

BESIDES the physical improvements in transportation facilities in Atlanta recommended in the recent report prepared by the Beeler Organization, and described in ELECTRIC RAILWAY JOURNAL for Jan. 10 and 24, extensive changes in bus and car routes and service are proposed. Under the new plan the report states that there would be an increase of about $700,000 a year in net earnings and a reduction in the operating ratio from 89.7 per cent to 77 per cent.

As the first step in any program to improve transportation conditions, the present jitneys must be eliminated. Not only have they taken about 10 per cent of the business that should have gone to the railway and thereby injuriously affected the income of the company, but they have added to the already serious traffic congestion in the business district. Moreover, they afford no material addition to the transit facilities to compensate for the damage they are doing.

Jitneys have been in operation in Atlanta for a number of years and recently have become a formidable competitor to the street railway. At the time the report was made there were no fewer than 230 jitneys of all classes in daily operation, mostly 5-passenger vehicles. They operate over and along the best lines of the railway where short-haul riding makes the remuneration from operation favorable.

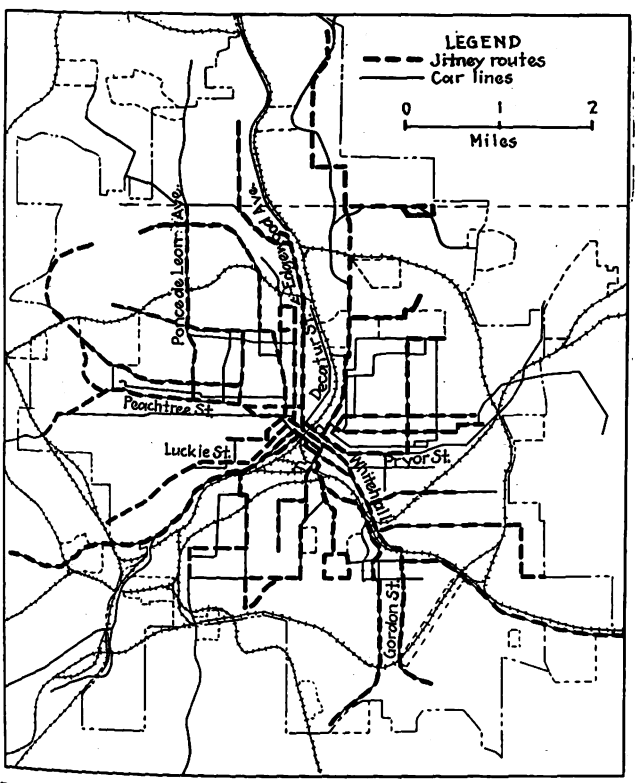
Checks made by the Beeler Organization showed a total of 23 jitney lines, all of which are being operated along the railway lines. Nineteen of the lines operate between residential sections and the business sections only, while four operate through-route city service. The routes are shown on an accompanying map. The jitney fare is 10 cents straight on 14 of the lines, and 7 cents on nine lines. Railway car fare is 7 cents, and the ticket rate is 6⅔ cents.

ANNUAL PASSENGERS CARRIED BY TRANSPORTATION AGENCIES IN ATLANTA

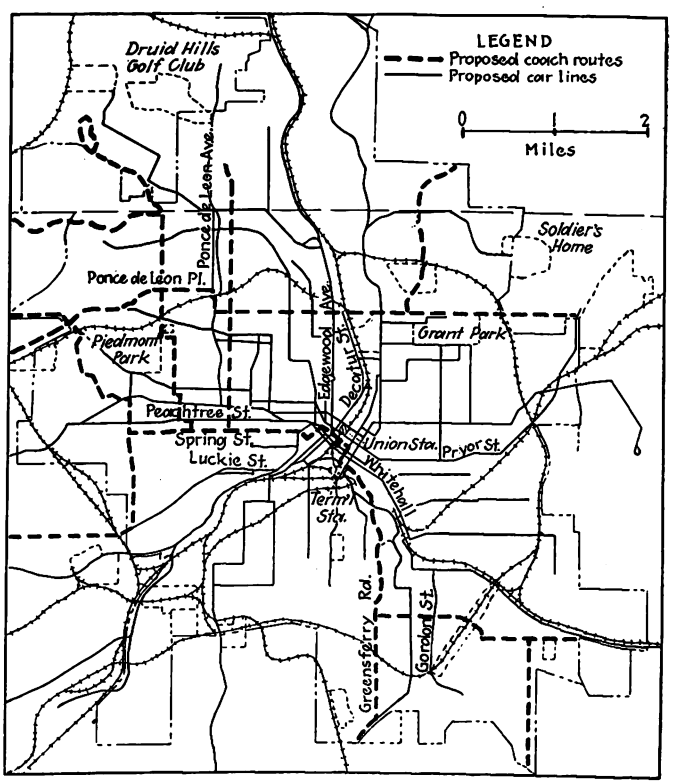
	Railway	Jitney	Total
Revenue	73,413,026	7,750,000	81,163,028
Transfer	19,967,265	.....	19,967,265
Total	93,380,291	7,750,000	101,130,291

To determine the volume of the jitney business, a complete field survey was made. By comparing traffic counts on the jitneys with similar data for the street cars it was clearly seen that with the exception of a few lines during the rush hour the seats furnished by the railway were adequate to care for all the traffic that presented itself.

The comparative figures in the table in this column give a good idea of the annual volume of business handled under present conditions.



Present Jitney Routes in Atlanta Follow the Car Lines and Operate Only in the Choice, Well-Populated Sections



Bus Routes of Co-Ordinated Service Plan Prepared for Atlanta by the Beeler Organization

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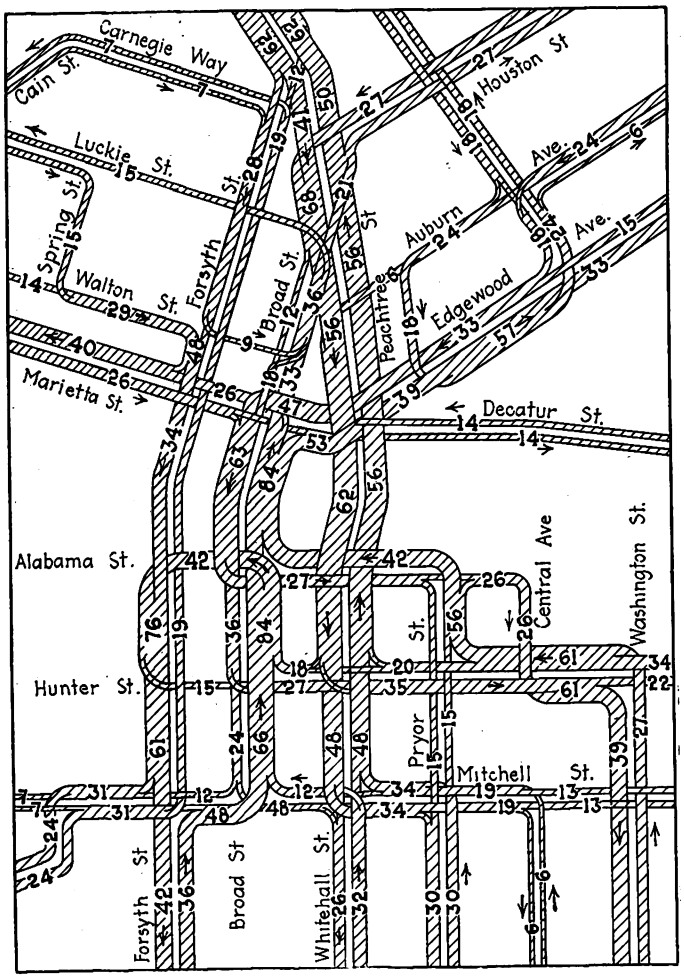
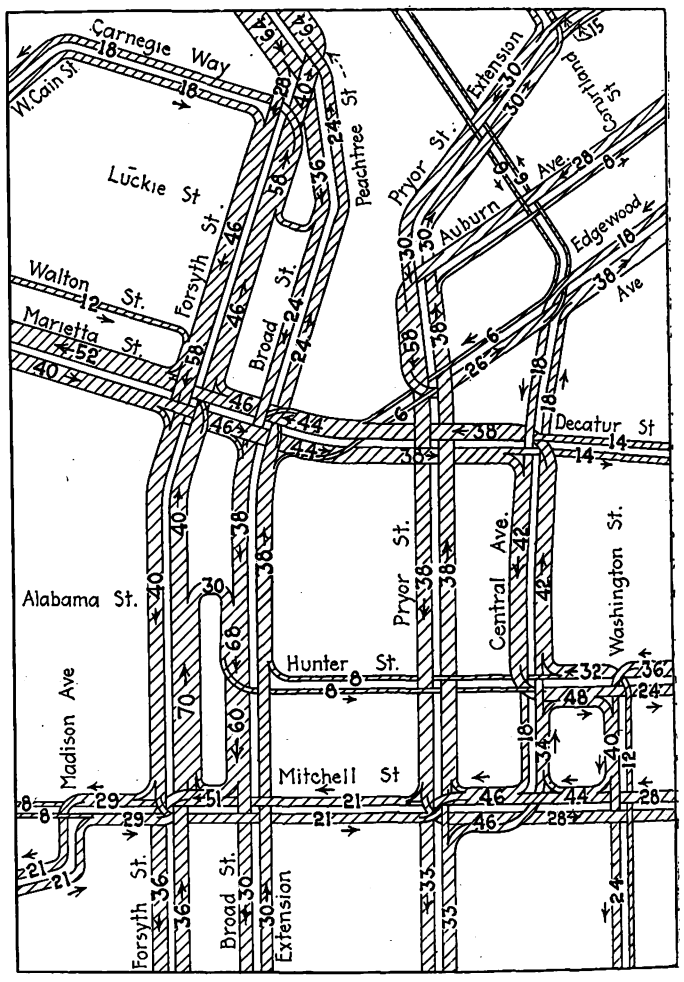
Of the total of 80,000,000-odd revenue passengers, the jitneys carry 7,750,000, or nearly 10 per cent. They are all revenue passengers and largely short riders, leaving to the railway 20,000,000 free transfers, the long-haul riders, and the problem of caring for the rush-hour maximum demand.

Increasing concentration of traffic in the business district presents another phase of this problem. Within the last 5 years the number of motor vehicles has increased practically threefold and is still climbing.



Present Car Routing Is Responsible for Many Turning Movements in the Congested District



Removal of Cars from Peachtree Street Is a Feature of the Proposed Routing Scheme

Checks showed that of the total vehicle traffic during the evening rush hour on Houston Street at Peachtree, one of the most congested corners in the city, one-fourth was jitney traffic.

The relative value of the street car for handling public transportation as compared with the jitney including the buses, as now operated, is shown in the following tabulation, which gives the approximate number of street cars and jitneys entering and leaving the central business district on a typical weekday during the peak of traffic, from 5 to 6 p.m.:

RELATIVE RUSH-HOUR TRAFFIC ON CARS AND JITNEYS

	Street Cars	Jitneys
Number of units	346	623
Passengers	16,286	2,260
Passengers per unit	47.1	3.6
Per cent of units	36	64
Per cent of total passengers	88	12

During the maximum hour there are already 80 per cent more jitneys in the central district than street cars. They carry only 12 per cent of the revenue riders, however, while the street cars carry 88 per cent. Were all these riders accommodated by street cars exclusively, the number would have to be increased by 48 per hour, bringing the total up to 394 cars per hour. Were conditions reversed and jitneys used exclusively, the report says that the number required would be 5,150 per hour, or more than eight times as many as now.

While the total mileage of the railway is but 40 per cent more than that of the jitney, it transports 10 times as many revenue passengers and is giving 529,000,000 seat-miles annually against 50,800,000 for the jitney. The speed of the jitney, viz., 12.85 m.p.h., is the greatest advantage it affords the patron; it is 37 per cent faster than the railway, and results in an average saving of about 4 minutes per ride.

Any appreciable increase in the number of jitneys operated, however, will slow the speed on account of the increased congestion. The speed of the jitneys at present is about the same as that of the street cars. On two lines the buses average respectively 9.2 and 8.9 m.p.h. With the improvement in schedules and routing of the car lines as proposed in the report it is estimated that the speed of the railway service will be raised from 9.37 to 10.32 m.p.h., which will tend to minimize the present difference.

The average length of ride of each revenue passenger is 3.40 miles on the railway and 2.11 miles on the jitney, which results in receipts at an average rate per mile of 1.99 and 4.26 cents, respectively. The jitney rate is therefore 113 per cent higher than the street

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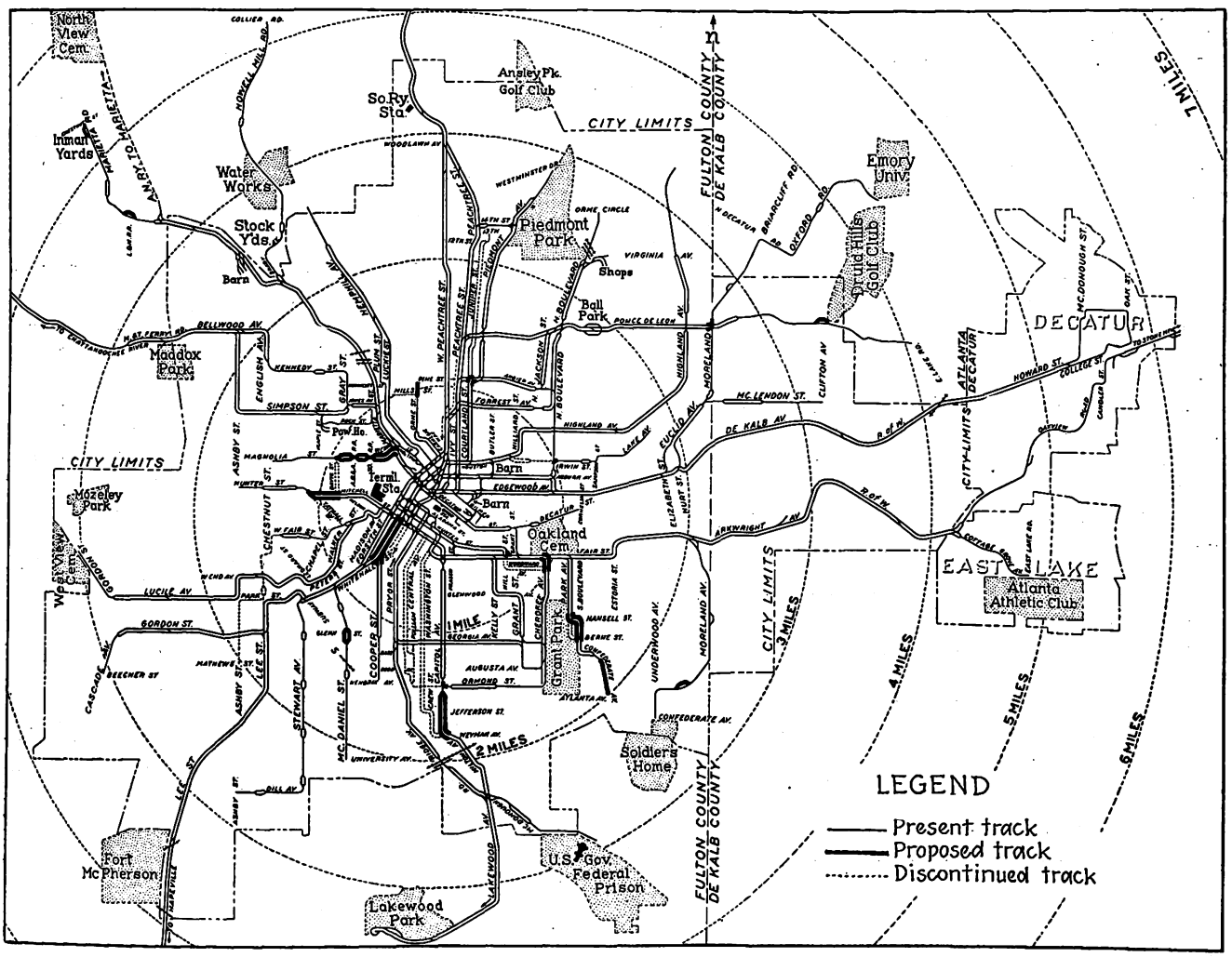
railway fare, based on the average length of ride of the patrons of the respective services. If the railway charged the same rate per mile that the jitney rider now pays, the railway would receive 14.48 cents per revenue ride. These figures are based on the average distance actually traveled by the revenue passengers and represent the actual transportation requirements of the community regardless of trip length of either car or jitney.

The report emphasizes the fact that jitney operation has no place in any real transportation plan and should be eliminated forthwith. Until this is accomplished, no improvement in or expansion of the transportation facilities of the community is practicable.



Track Changes to Cost More than $500,000 Are Recommended in the Beeler Report. These Are Shown Here

Proposed Rerouting of Cars

Another step in the direction of improving transit facilities is to reroute a number of car lines. At present the railway operates 23 city lines, of which 16 are through lines; the other seven turn back in the business district. A number of the lines extend beyond the present city limits; in fact, five of them are suburban. The number of cars passing along the various streets in the business district during the peak hours of the evening rush, given in an accompanying map, shows the multiplicity of turning movements at many of the busiest corners, and unbalanced traffic on some of the most frequently used streets.

A change in routing, as indicated on another map, will tend to bring about an equalization of car traffic on the main business streets, enlarge the delivery area in the downtown district, minimize the turning movements on the heaviest traffic thoroughfares and provide for faster and more economical operation. In the proposed plan the through-routing feature is retained and communities of mutual interest connected wherever practicable. A number of routes are rearranged in order to obtain better balancing.

A general simplification of the railway movements will be had while retaining for all routes easy access to the entire business district. Peachtree Street below Luckie will be left open to vehicular traffic only, thereby making three through streets, out of the seven from Spring to Washington, exclusively for such traffic. This should greatly facilitate the movement of all traffic and provide a purely vehicular thoroughfare in the center of the city.

In order to obtain preliminary relief, the Pryor Street viaduct, described in ELECTRIC RAILWAY JOURNAL for Jan. 24, must be constructed first. A temporary plan for relief can be instituted immediately thereafter. The final plan cannot be instituted in its entirety until both the Pryor Street and the Central Avenue viaducts are completed and the Pryor and Broad Streets openings made. All of these important improvements are included in the list of civic improvements mentioned in this paper last week.

As a result of the various routing changes, operation

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will be discontinued on some 19.22 miles of track, while 7.82 miles of new track must be built. These items are summarized below:

NEW TRACKS TO BE BUILT IN ATLANTA

18,000 ft. of straight track and 5,740 ft. of special trackwork inside of business district	$305,055
14,985 ft. of straight track and 2,500 ft. of special trackwork outside of business district	200,553
Total	$505,608

Some of the track abandoned is due for replacement soon, so the expenditure does not all represent the cost of the revised plan.

Many other service readjustments are recommended for adoption along with the new routing. At present an average of 5.6 stops per mile is actually made during the middle of the day, and 7.2 stops per mile in the heaviest direction during the rush hour. Within the 7-mile zone, which includes the suburban territory, the stops average 492 ft. apart, or 10.7 per mile. In the suburban territory the stopping places average about 8.4 per mile, and in the city about 11.5. Stop locations should be rearranged, the report states, in such a way that the average spacing will be about 650 ft.

Street car stops should be marked by distinct signs. This will avoid any confusion on the part of the patron as to the exact location of the stop. At heavy loading points where traffic stanchions or raised platforms are employed other signs are not necessary. Elsewhere, however, the trolley poles can be painted with light yellow bands about 3 ft. wide and having the sign "Car Stop" indicated thereon in black letters. This inexpensive and effective marking is visible at a distance, and instantly guides the patron to the stopping place.

At present on some single-track sections stop signs are placed on only one side of the street. This is confusing as the patron is apt to infer that there is another location for the stop in the other direction. To make the location more definite, a sign should be placed at every stop in each direction. Positive stops should be marked by signs suspended from the span wires. When the same location serves as a passenger stop and a positive stop, both signs should be displayed.

The extended use of the private automobile has emphasized the desirability for higher railway speeds wherever practicable. The jitney bus, unsafe and unreliable as it may be, secures considerable business by reason of its greater speed. At present, Atlanta's street cars make on an average only 9.36 miles per car-hour. Smoother traffic movements in the business district, the elimination of superfluous stops, double tracking of single-track lines now operating with short headways, wider entrances and exists, etc., will all be beneficial factors in speeding up the service. It is estimated that with these changes in effect the average speed can be brought up to at least 10.32 car-miles per car-hour, which is an increase of 10 per cent.

Regularity of service and even headways are of prime importance. If there is travel only sufficient to warrant a 15, 20 or 30-minute headway, patrons know when the car is due and they can readily adjust their movements to take a given car, but with cars running off of schedule, or on a schedule where odd headways are employed, such as 9, 14 or 17 minutes, it is very exasperating as patrons cannot readily calculate when a car is due. Car lines that are too close to each other frequently make it necessary to dilute the service. Often the public would be much better served with one good line on a frequent headway than with two or more poor ones with infrequent headways. Discontinuance of some duplicate track is recommended to permit an improvement of headways on a number of lines.

A comparison of the total daily scheduled car-miles and car-hours present and proposed is as follows:

SUMMARY OF MOTOR AND TRAILER OPERATION

	Present	Proposed
Motor Cars:		
Car-miles	38,361	36,959
Car-hours	4,114	3,593
Car-miles per car-hour	9.33	10.29
Trailer Cars:		
Car-miles	986	1,851
Car-hours	92	166
Car-miles per car-hour	10.69	11.15
Total Cars:		
Car-miles	39,347	38,810
Car-hours	4,206	3,759
Car-miles per car-hour	9.36	10.32

Under the proposed plan practically the same number of car-miles will be operated daily, viz., 38,810 against 39,347, but with a reduction of 447 car-hours daily. Additional trailer operation to the extent of 74 car-hours daily will replace motor car operation. This assists in obtaining a large proportion of seats with a minimum cost of operation. Approximately 100 car-hours added to the schedules proposed in this plan would give ample and satisfactory service to care for the additional patronage, if jitney operation were discontinued. On several lines the report recommends the establishment of one-man operation.

As a result of the changes recommended, there should be a marked increase in the net earnings of the railway. A comparison of the annual operations under the present and proposed plan follows:

FINANCIAL RESULTS OF PROPOSED CHANGES

	Present Operations	Proposed Operations
Operating revenues	$5,057,704	$5,274,704
Operating expenses	$3,827,346	$3,330,646
Taxes	340,000	282,300
Renewals and retirements	374,000	450,000
Total operating deductions	$4,541,346	$4,062,946
Net earnings	$516,358	$1,211,758
Operating ratio, per cent	89.7	77.0

Co-ordinated Bus Service

With competitive jitney operations effectively controlled, a co-ordinated system of railway and bus operation should be inaugurated, the Beeler report says, to serve the park, parkway and boulevard sections of the newer residential districts where the extension of car lines is not practicable. Two such districts already exist in Atlanta. One is Ansley Park and the section further to the north, including Morningside. Another district that is building up practically without car service is that along Virginia Avenue. Much of this development has been during the past year.

Immediate establishment of two bus routes and the subsequent addition of others is recommended in the report. About 15 coaches with garage and shop facilities will be required to inaugurate this system, involving an initial investment of between $300,000 and $350,000, depending upon the type of coach.

The cost of service per coach-mile was estimated for both single and double-deck types. The former type is best suited to operate on roadways with the high crown encountered in some of the residential sections.

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ESTIMATED COST OF BUS OPERATION
In Cents per Bus-Mile

	Single Deck	Double Deck
Operating Expenses:		
Maintenance of equipment	7.0	8.5
Conducting transportation	13.0	18.0
Injuries and damages	1.5	2.0
General and miscellaneous	2.0	2.0
Operating expenses	23.5	30.5
Taxes	1.5	1.8
Renewals and retirements	3.7	4.7
Interest	3.3	3.8
Total cost of operations	32.0	40.8

The double-deck type, similar to that in use on Fifth Avenue, New York, would of course render an extremely popular type of service especially appreciated by the public during the fair and warm days and delightful evenings, but they would involve improvements to the roadways in numerous places. This type also costs more to install and more to operate.

A comparison of the essential financial and operating features, as estimated, based on an annual total of 735,000 bus-miles, is as follows:

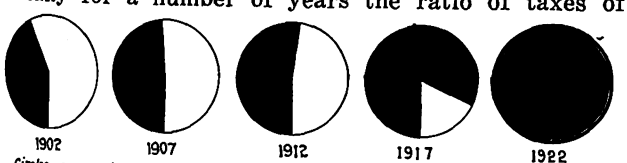
ANNUAL BUS OPERATING ESTIMATES

	Single Deck	Double Deck
Investment	$300,000	$350,000
Revenue passengers	2,200,000	2,600,000
Revenue at 10-cent fare	$220,000	$260,000
Operating expenses	$173,000	$225,000
Taxes	$11,000	$13,000
Renewals and retirements	$27,000	$34,500
Interest at 8 per cent	$24,000	$28,000
Deficit	$15,000	$40,500

From the foregoing it is seen that after providing for operating expenses, taxes, renewals, and a return on the investment, a deficit of $15,000 for the single and $40,500 for the double-deck type may be expected. In fact, if the organization does as well as this for the first year or so while the coach system is in the process of development, it will do better than similar enterprises have done elsewhere. Little or no additional overhead expense need be incurred in the operation. Harmonious co-ordination of the services will be readily established and an interchange of passengers by transfer will be possible.

Not a Picture of the Eclipse

THE accompanying diagram is not a series of pictures of the eclipse of Jan. 24, but a chart reproduced from the January issue of the *Journal of Land and Public Utility Economics* and from an article by Herbert E. Simpson on the taxes borne by the public service industry. This particular chart presents pictorially for a number of years the ratio of taxes of



Circles represent corporate net income as 100% A-Ratio of taxes to corporate net income

Diagram Showing Increase in Electric Railway Taxation

electric railway companies to their corporate net incomes. It is based on census figures which show that during the last 20 years, while the gross receipts of the electric railways have almost exactly quadrupled, the expenses and the taxes have increased almost exactly five times. In consequence, in 1922, the taxes for all of the electric railway companies in the United States had become 53 per cent of all income, after expenses and charges, or more than corporate net income.

Campaign to Reduce Accidents

Boston Elevated Begins a Course for Platform Men Under Direction of Claims Department—Weekly Talks Sent to All Transportation Employees

A NOVEL method of getting the principles of accident prevention to the 3,900 men of its transportation department is being used this winter by the Boston Elevated Railway. A series of papers, prepared by the claims department staff, are being sent weekly to the men's homes. These papers are written as reports of meetings, presided over by General Manager Edward Dana, assumed to have been held just previously. The report form is used because it is both novel and interesting. In each "report" the "speaker" presents his "talk" and then answers questions which members of the audience are supposed to have asked.

The first "report" was that for Jan. 7, and the program of "talks" as announced in a preliminary bulletin sent to the men is as follows:

"Accident Prevention," by Russell A. Sears, general claims attorney.

"What Claims and Suits Against the Railway Mean to the Public and the Railway," by Maurice P. Spillane, attorney.

"Accident Reports," by John J. Reynolds, claims attorney.

"Obtaining Names of Witnesses," by Michael F. Doyle, chief investigator of claims.

"Boarding, Alighting and Falling Cases," by E. F. Livingston, chief investigator of litigated claims.

"How Accidents Are Paid For," by David F. Lee, chief clerk claim department.

"A Few Things I Have Heard in 25 Years in the Claim Department," by Mary F. Donnelly, head stenographer claim department.

"What the Original Accident Looks Like in Court," by Rupert L. Mapplebeck, trial attorney.

A feature to stimulate interest in the "talks" is that the company has offered during May to give such employees as desire to do so the opportunity to take an examination on their contents. The two employees in each division who in the opinion of the judges pass the best examination and whose accident record since Jan. 1 has been meritorious will be suitably rewarded. The company has announced that, in the examination, handwriting will not be counted, nor will the style be considered. The criterion will be the knowledge of the subject and the common sense shown in the answers to the questions.

In the first "talk," Mr. Sears pointed out the great care required to avoid accidents in the crowded streets of the present-day city, and that under the Massachusetts law a trolley car has no superior right of way over other vehicles on the street. Hence, the ringing of a gong is simply a warning, not an order. He touched on the special care needed to avoid accidents to children and the duties of the conductors in regard to closing car doors.

In the second "talk," given by Mr. Spillane, the speaker explained why every accident presents a possibility of a claim, and he gave statistics of the accidents, claims, damages, etc., of the company during the past 2 years and what these claims meant in the way of fares paid.

In the "address" of Jan. 21, John J. Reynolds emphasized the importance of reporting all accidents "promptly, accurately and fully," getting all the witnesses possible.

These "talks" are the outcome of a meeting of several hundred transportation department men held last year.

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Track Machinery Combined Into a Single Unit

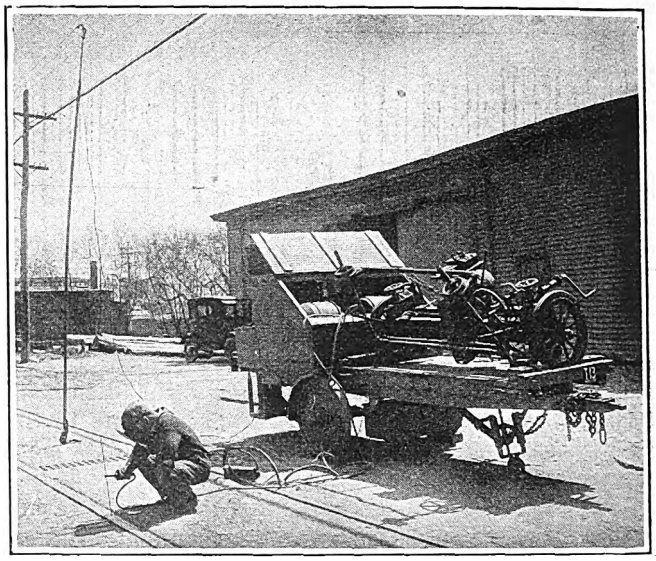
By Mounting Its Cutting, Welding and Grinding Equipment on an Automobile Trailer, the Eastern Massachusetts Street Railway Has Made It Possible for Fewer Men to Complete Reconstruction Jobs in Shorter Time

THE construction by the Brockton division of the Eastern Massachusetts Street Railway of a trail truck to carry various pieces of track machinery that were formerly transported as separate units has increased to a marked extent the efficiency with which construction jobs are done. For the installation of special work or the rebuilding of short sections of track a number of different machines are required. Plate welding requires two men and one machine. Surface welding and grinding require other men and more machines. Moreover, when switches, frogs or mates are installed, it is frequently found that compromise joints, or plates, do not fit and it is then necessary either to send them to the nearest shop or to take an oxyacetylene outfit to the job.

To reduce the waste of time and avoid duplication of movement, the railway has combined cutting torches, surface welders, surface grinders and a seam-welding outfit into a single unit. This is a 3-ton trailer which is operated by one man and his helper. When not actually welding or grinding at welders' wages of 60 cents an hour, these men are working at laborers' wages of 50 cents an hour. Two men and this single unit are now able to do the work which formerly required five men and four different kinds of equipment.

The two tanks for the oxyacetylene cutting outfits are carried on the rear step of the trailer. Sufficient hose is provided to reach any rail of double track while the vehicle remains near the curb. Welding apparatus is carried on the back part of the trailer while a universal grinder is located on the forward part. A box has been provided for the welding apparatus so that it can be lifted off the trailer platform if needed for use elsewhere. The equipment is a standard General Electric welding machine with a reverse polarity switch, so that it can be used also for surface welding.

Between the welding apparatus and the oxyacetylene tanks a smaller box has been provided for tools. All



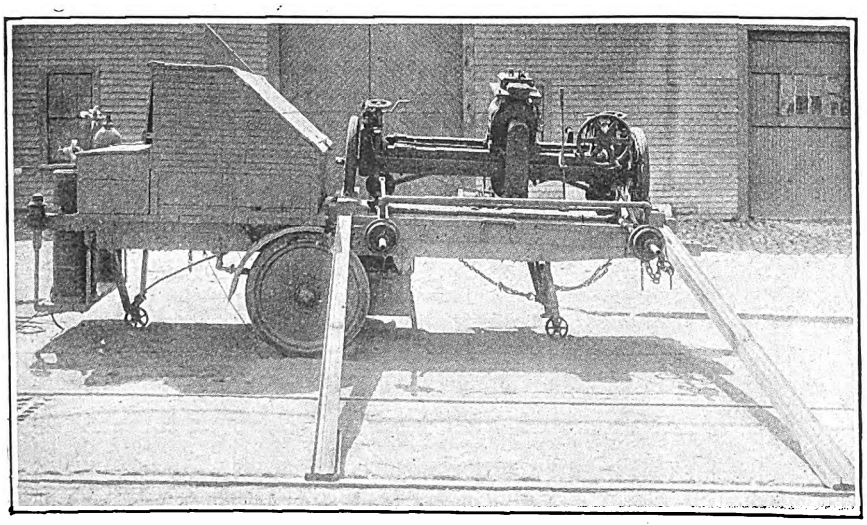
One Man Can Raise or Lower the Universal Grinder to the Street by Means of a Crank Windlass. Note the Struts to Keep the Trailer in a Horizontal Position

track tools that might be needed on a small job can be carried in this box. It is of sufficient size to hold comfortably a Jackon tie-tamping outfit. Another smaller tool box for the operator's hand tools is swung beneath the trailer.

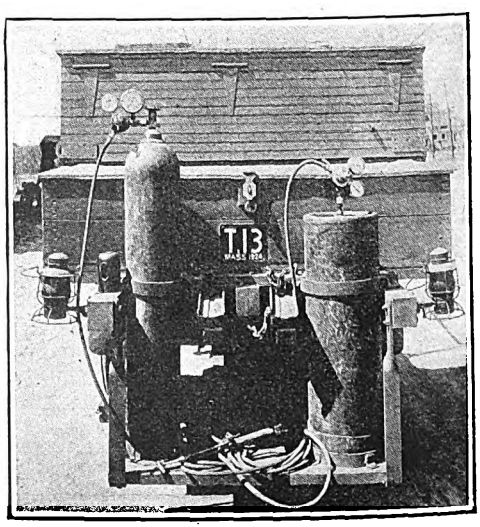
The front platform has been lengthened to provide room for a Universal chain-driven grinding machine. Inclined skids permit the grinder to be rolled down to the ground and up onto the platform. When not in use the skids are carried lengthwise under the body of the vehicle, as shown in an accompanying illustration. A crank windlass has been installed so that this heavy machinery can be raised and lowered by one man.

A spring drawbar connects the trailer to the motor truck. Safety chains prevent any possibility of accident should the drawbar break. At each end of the platform there is a strut which keeps the trailer in a horizontal position after it has been detached from the motor truck. Wheel chocks are provided to hold the trailer when it is necessary to stop on a grade.

For small jobs the trailer can be moved easily by hand. The struts have small wheels at their lower end to facilitate these movements. When it is necessary to move the vehicle more than 200 or 300 ft., the struts are pulled up out of the way and the trailer is moved by motor truck.



This Trail Truck Has Been Designed by the Eastern Massachusetts Street Railway to Carry All the Machinery Needed for Small Track Construction Jobs



Oxyacetylene Welding Tanks Are Carried on a Rear Step. The Skids Are Carried Lengthwise Underneath the Platform

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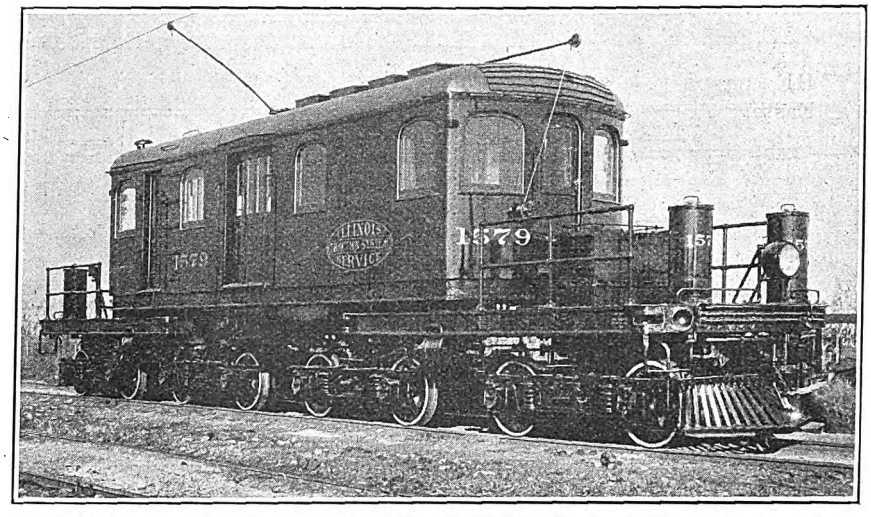
I.T.S. Builds Articulated Locomotives

Eighty-Ton Freight Units Are Designed to Operate Around Short Radius Curves—By Using Eight Axles, Wheel Loads Are Kept Low—Passenger Car Motors Used with External Blowers

TO HANDLE its increasing freight business, the Illinois Traction System has recently put into service the first of a group of six new articulated locomotives that include some very novel departures from current practice. These locomotives, which were designed by the company's engineers and built in the Illinois Traction System shop at Decatur, Ill., weigh 80 tons each, have eight driving axles and will negotiate a 35-ft. radius curve without any difficulty.

This combination of features is made possible by the articulated construction. Operation over tracks in city streets in many of the communities served by the company made it important to provide a locomotive unit that would successfully negotiate sharp curves. Increase of the weight to 80 tons was dictated by the advisability of hauling longer trains of freight. At the same time, however, there was the problem of operating a unit of this size over 70-lb. rail and the light bridges at some locations on the property. By the use of the articulated construction the weight is distributed to eight driving axles, thus making the wheel loads less than those on older locomotives of smaller capacity. The load per wheel is only 10,000 lb.

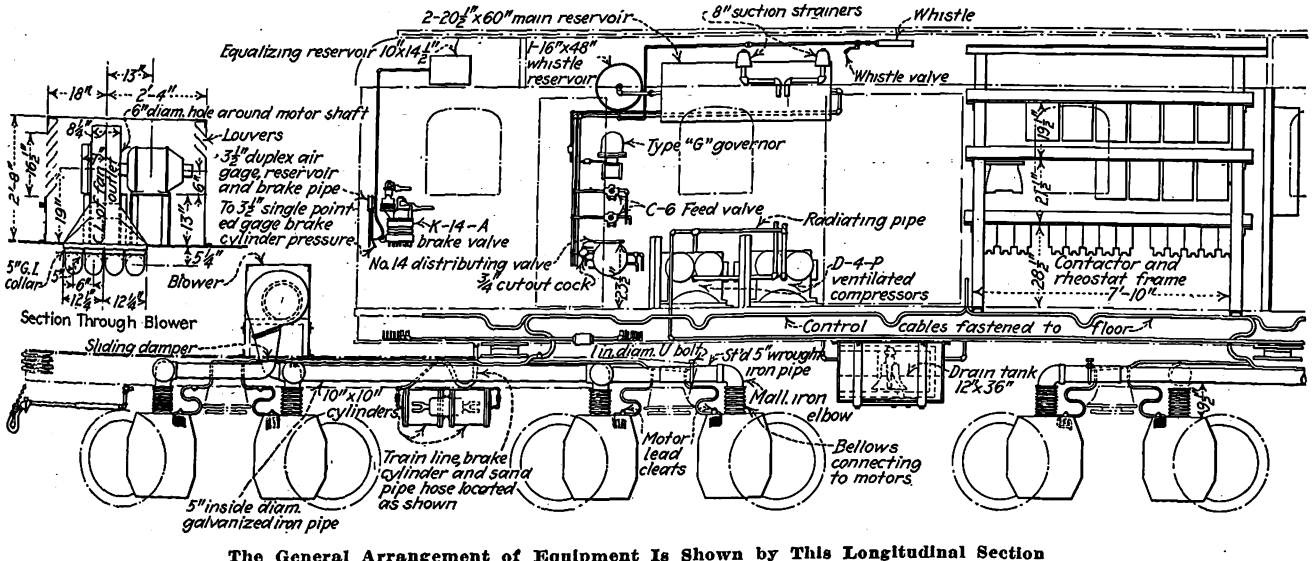


Six New Locomotives of This Type Are Being Built by the Illinois Traction System in Its Decatur Shops

The main body frame is carried on two sub-frames so as to give an articulated construction that makes it possible to operate this 80-ton unit around a 35-ft. radius curve in city streets without difficulty.

External Blowers for Motors

Another interesting feature is the use of external blowers to increase the capacity of motors that had been in service on passenger equipment, so as to make them suitable for use under the locomotives. These are GE-73-C-8 motors, having a nominal rating of 75 hp. with 17-73 gear ratio on 33-in. diameter wheels, and the locomotive design was worked out with a view to using these motors in freight service. At the same time, the comparatively small wheel loads on the locomotives made it possible to use the trucks from these cars as well as the motors. This plan was considered to have two advantages; first, by finding a method of utilizing motors and trucks that had been in service under old and heavy passenger cars, it was possible to make room for new modern passenger equipment without scrapping these motors and trucks, which although



The General Arrangement of Equipment Is Shown by This Longitudinal Section

Blowers on each platform force cooling air through the rebuilt passenger car motors, increasing their capacity so as to make them suitable for freight service.

The air is transmitted from each blower through sheet metal ducts to the corresponding four motors at that end of the locomotive.

Connection from the ducts to the motors is made through flexible bellows, to permit the necessary movement on short radius curves.

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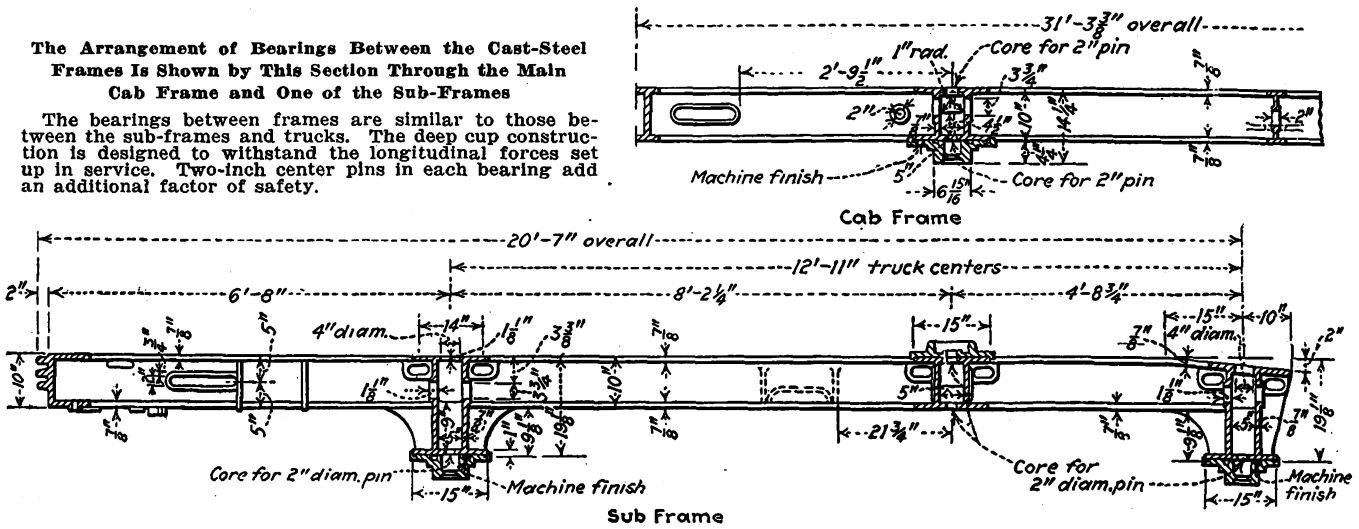
The Arrangement of Bearings Between the Cast-Steel Frames Is Shown by This Section Through the Main Cab Frame and One of the Sub-Frames

The bearings between frames are similar to those between the sub-frames and trucks. The deep cup construction is designed to withstand the longitudinal forces set up in service. Two-inch center pins in each bearing add an additional factor of safety.

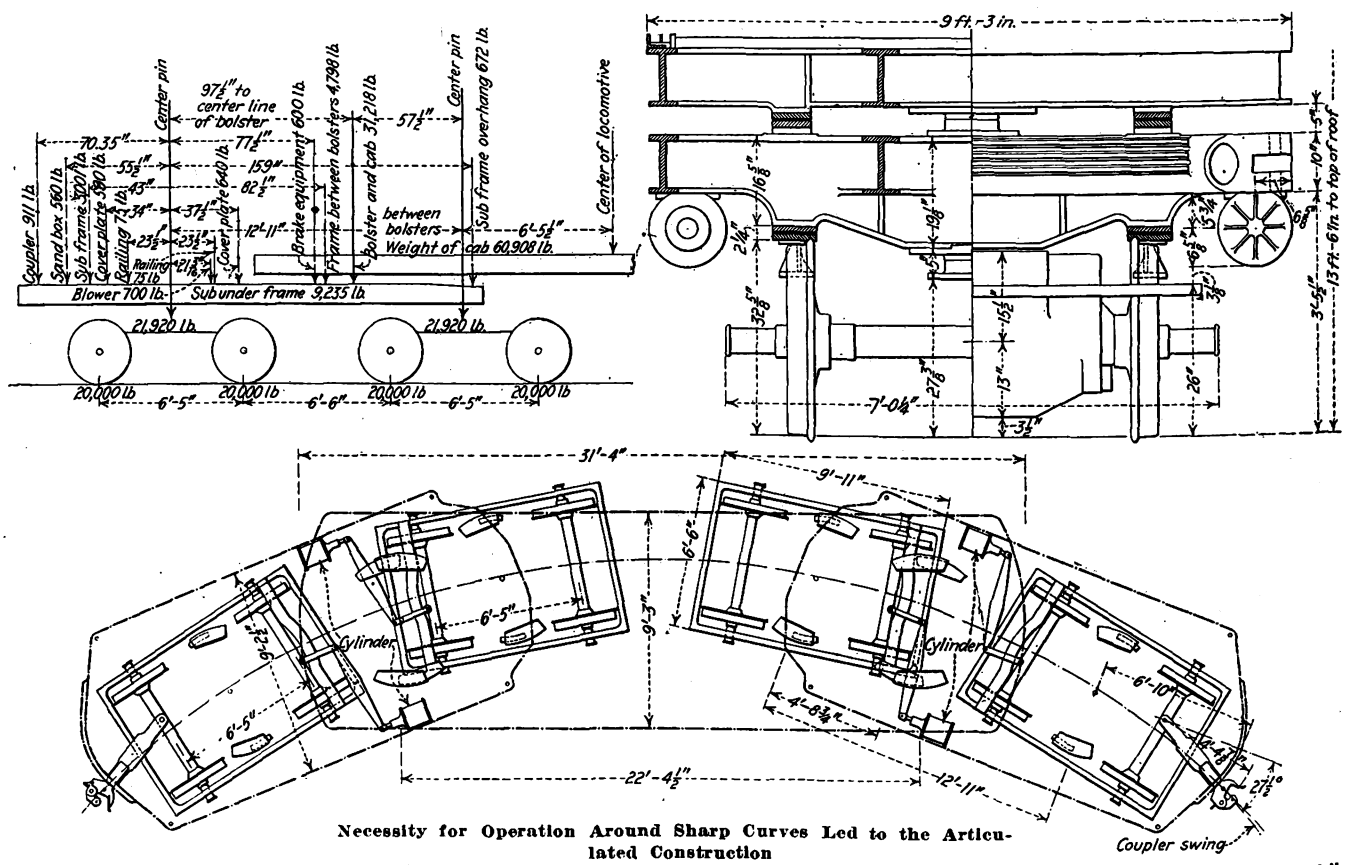


heavy for passenger service were in good condition and were completely overhauled before installation on the locomotives. In the second place it was considered a much simpler matter to apply forced ventilation by external blowers to a freight locomotive than would be the case on passenger cars.

In the articulated design as finally developed, the main cab frame is carried on two sub-frames, each of which in turn is mounted on two trucks, thus making four trucks and eight motors under the complete unit. The bearings between the main cab frame and the sub-frames are similar to those between the sub-frames and the trucks. They are of a deep cup type, as shown in the accompanying longitudinal section through the center line of the frames. These bearings are liberally designed to take the maximum end thrusts developed and are provided with 2-in. center pins.

Both the main cab frame and the two sub-frames are made of one-piece steel castings. These are excellent examples of high-grade steel foundry work, because of the large over-all dimensions and comparatively light sections. They were made by the Commonwealth Steel Company of St. Louis. The three frames forming one complete unit are shown in an accompanying illustration.

To obtain the necessary weight, the main cab frame is filled with ballast consisting of concrete and iron punchings. This is supported by ¼-in. boiler plate, put in buckle-plate fashion and resting on the lower flanges of the I-beam sections of the casting. In the completed locomotives, the top of that portion of each sub-frame which extends beyond the cab is covered with ¼-in. diamond checked floor plate. This is riveted to the cast-steel frames, and the seams are then welded together.



Necessity for Operation Around Sharp Curves Led to the Articulated Construction

In the upper left of this drawing is shown a load distribution diagram, arrows indicating center of gravity of equipment named.

Although the locomotives weigh 80 tons, the load per axle is only 20,000 lb., or 10,000 lb. per wheel. Vertical clearances above the rail are shown in the cross-section at the right of the illustration, while the position assumed on a curve by the frames and trucks is shown in the drawing below.

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The bearings between the cab frame and the sub-frames are located so as to give equal distribution of weight to all wheels. The main frame weighs 11,000 lb. and each sub-frame weighs a little more than 9,000 lb. With the cab and apparatus mounted, and with ballast, the complete body weighs 60,908 lb. It will be noted from the illustrations that the bearings on the sub-frames are 1 ft. 8¾ in. inside the center line between the trucks at each end, in order to balance the overhang of the sub-frames and the apparatus mounted on them.

Four Trucks Equally Spaced

The locomotives are 52 ft. 5 in. long over the bumpers. Bearings between the main frame and the sub-frames are spaced 22 ft. 4½ in. apart, and all four trucks are equally spaced on 12-ft. 11-in. centers. The cab is 31 ft. 4 in. long, 9 ft. 3 in. wide, and 13 ft. 6 in. high from the rail to the top of the roof. With 33-in. wheels, the top of the sub-frame at each end is 4 ft. 3½ in. above the rail, and the distance from the rail to the top of the cab frame is 5 ft. 6½ in. Side bearings on the trucks and between the main and sub-frames are of the plain rub-plate type. Accompanying illustrations show the heights of the various parts above the track, and also the position assumed by the trucks and sub-frames on a curve.

Two blowers supply the ventilating air to all eight motors. Each of these is a Sturtevant single-width, single-inlet, multivane fan, delivering approximately 300 cu.ft. of air per minute to each motor. They are mounted in sheet metal housings, one on the platform at each end of the locomotive. These housings are provided with deep louvers designed to prevent rain or snow from being drawn in with the cooling air. The air is delivered through slide dampers to 5-in. round galvanized sheet-metal ducts, a separate duct being provided from the fan housing to each motor. Malleable-iron elbows connect these ducts with flexible bellows, approximately 10 in. long, at each motor. The general arrangement is shown in the accompanying drawing which is a longitudinal section through the equipment.

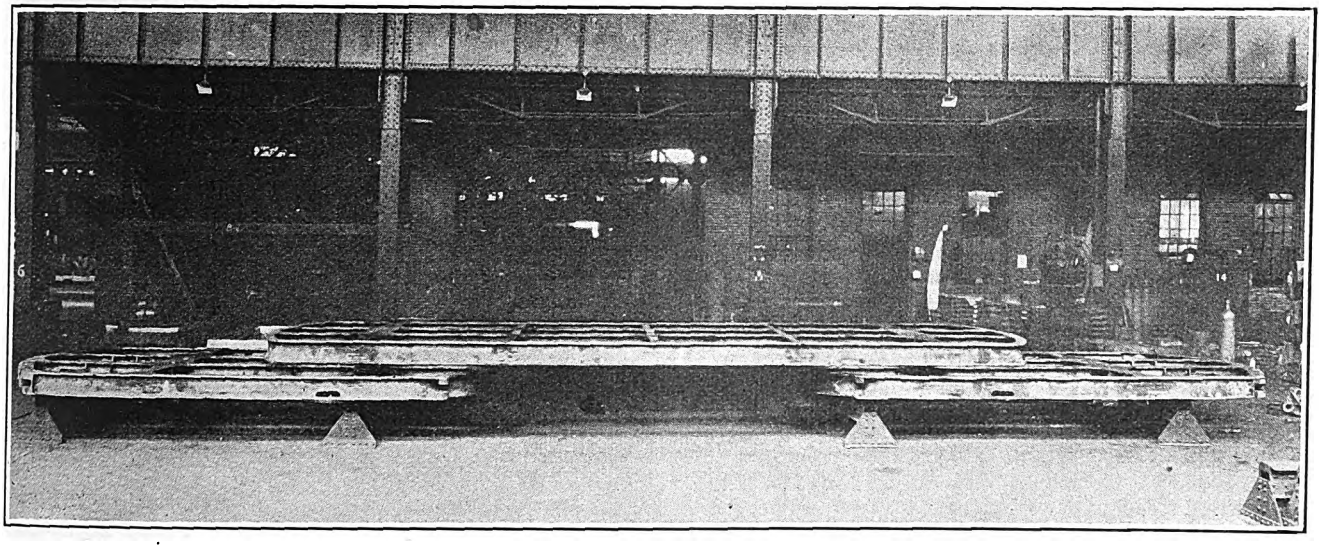
The blowers are driven by 3-hp. motors mounted inside the housings. These are designed for operation at 2,000 r.p.m. on 600 volts, and are connected directly to the line with no starting resistance. It is estimated from tests that the safe capacity of the motors is increased to 125 hp. on a 1-hour basis without excessive temperatures, as a result of the ventilation supplied by the blowers.

Multiple-Unit Control

General Electric type-M multiple-unit control is used. This includes a C-6 controller at each end of the locomotive, with type 13-DB-41 contactors and one DB-22-B reverser for each set of four motors. Through the use of multiple-unit control, the locomotives can be connected together to haul loads in excess of the capacity of a single unit. The contactors are mounted in a special frame on the interior of the cab where they are conveniently accessible, and the motor cut-out switches are placed in a special panel box built at one end of the contactor frame.

Compressed air for brakes is supplied by two D-4-P Westinghouse ventilated type 50-cu.ft. compressors. The complete air-brake equipment is Westinghouse 14-EL type. One 10-in. x 10-in. brake cylinder is provided per truck, making four cylinders in all. These are mounted on opposite sides of each sub-frame and are connected to their respective trucks by a single lever and short pull rod, arranged so as to allow the trucks to assume their proper positions on a curve. Hose connections between the air pipes on the main frame and those on the sub-frames, including the brake cylinder pipes, allow the necessary movement. Check valves are arranged so as automatically to cut off the air to any given cylinder in the event of a ruptured hose at that cylinder, thus insuring operation of the three other cylinders.

When it became apparent that increased freight business made it very desirable to handle longer trains, substation capacity was found to be a limiting factor. On the main division out of St. Louis, between Granite City and Staunton, Ill., 300-kw. stations spaced 10 miles apart were in service. Seven additional stations of 1,000-kw. capacity each were added on this division, making the spacing between stations 5 miles instead of 10.



The Three Cast-Steel Frames for One Complete Unit Are Shown Here in Their Relative Positions

Large over-all dimensions and comparatively small sections made a difficult steel foundry problem. The castings for all six locomotives were made by the Commonwealth Steel Company of St. Louis.

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Track Reconstruction Speeded Up by Using Mechanical Ties

Dayton City Railway's Standard Method of Construction Includes a Longitudinal Support Under Each Rail—Concrete Foundation and Paving Is Poured in One Operation

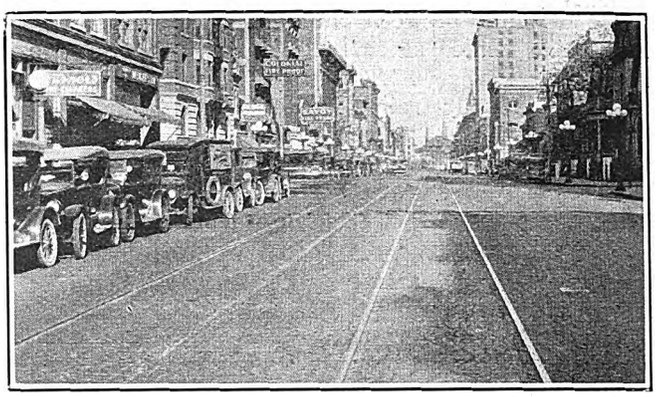
BY T. E. HOWELL
General Manager the City Railway, Dayton, Ohio

FOUR miles of equivalent single track was recently rebuilt on West Fifth Street, Dayton, in what is considered to be a remarkably short time. The method of construction which the City Railway used on this job is the standard which has been in use by this company for several years. The plan is extremely simple and it seems to distribute the strength of the track foundation so as to support adequately those points where the greatest strength is needed and to save construction cost where such strength is superfluous.

The rail used is Lorain 7-in. high T, and 8-hole fish-plates are arc welded to the base of the rail. The base of the rail at the joint is welded to the top plate of the joint tie. The pavement is brick upon a 6-in. concrete base with a 1-in. sand cushion between the brick and the concrete. The total excavation for the pavement is 11 in., of which 4 in. is for brick, 1 in. for sand cushion and 6 in. for concrete foundation.

In the older type of construction of wood ties on 8 in. of gravel ballast which was formerly used, the excavation required was 7 in. for the rail, 6 in. for the ties, 8 in. for the ballast beneath the ties; a total of 21 in. in depth or 10 in. below the paving excavation. This required about 315 cu.yd. of excavation per 1,000 ft. of track. By digging a trench 5 in. deep and 18 in. wide under each rail and using Dayton mechanical ties with a cushion feature to protect the concrete, an efficient track foundation is secured with the use of 46 cu.yd. of excavation and concrete, as compared with the much larger quantity required by the former method. A cross-section of this roadbed and the tie spacing are shown in accompanying drawings.

The operation of placing the ties is very rapid. The rails are blocked up on sections of the old wood ties. The foreman marks the rails to guide the men in spacing the ties, and every fifth tie is then hung to the rails and the latter brought to the correct gage at these points. The intermediate ties are then hung to the rails with great rapidity. The work of pouring the concrete is done in the same operation with the pouring of the concrete for the paving foundation.



This Track Built with Dayton Mechanical Ties Has Stood Up Well Under Heavy Traffic for Seven Years

To do this work with the least possible delay to traffic, the 2 miles of double track was divided into six sections. When the steam shovel completed the excavation of one section, it moved to a section at the other end of the opposite track. Thus it was possible to continue the trackwork and the movement of cars without serious interruption while concrete was setting.

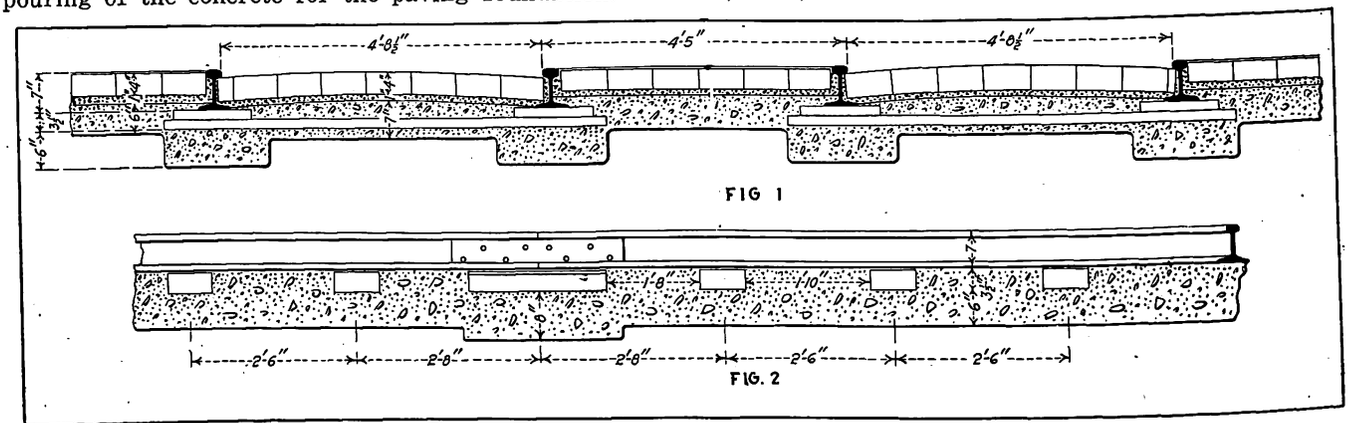
The first construction of this type has been in use by the City Railway since 1917, under the very heavy traffic. Both the Fifth Street and Kammer Avenue divisions operate 20-ton double-truck cars on a 5 to 7-minute headway. Track and pavement are still in good condition as shown above.

Weekly Bulletin from General Manager Goes to Every Beaver Valley Employee

WITH the object of instilling the idea of courtesy in the minds of all the trainmen, the general manager of the Beaver Valley Traction Company, New Brighton, Pa., sends out a weekly bulletin. This practice was begun last spring and was continued for 15 weeks. Then after an interval a second series was started on Oct. 3.

These bulletins are sent to all employees through the United States mail on Friday of each week. The names of many local people, such as the secretaries of chambers of commerce and managers of industrial plants, are included on the mailing list.

A favorable reaction from the bulletins has been noted. There is no unit by which this can be measured except that the managers of industrial plants think that the effort to inspire ideals among the employees is a good one. Neither can the absorption of an idea be measured, but at some time in the future life of the



The Standard Track Structure of the Dayton City Railway Has a Longitudinal Support Under Each Rail

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individual the increased mental activity produces results. It is the intention to continue these bulletins for several weeks more and then to have a two or three-month intermission. Some other project will be under way prior to the cessation of the bulletins to take the place of and augment the previous endeavors.

Among the interesting items contained in these bulletins are the following:

When in doubt, lead a trump. This refers to business as well as to cards.

Words are like cards—and the kind words are trumps.

You might have a dispute on your car and be in doubt as to how you are going to get out of it. Lead a trump (a kind word) and, nine times out of ten, you will take the trick.

Diplomacy is a habit, but it requires thought. The only difference between the blunderer and the diplomat is that the latter thinks.

When your wife asks you, "Who is the prettiest woman on the dance floor?" be a diplomat and don't rubber around the room.

4 THOUGHT

It's easy 2 C, but hard 2 4 C.
But that is no reason why we should not try to foresee.

Increasing the Speed of Car Loading at Terminals

Studies Made by Detroit Department of Street Railways Indicate Waste of Time in Boarding and Point Way to Modification of Car Entrances

BY H. S. WILLIAMS
Assistant Superintendent of Equipment,
Department of Street Railways, Detroit

IN THE handling of traffic in cities, one of the prime factors in car design is the speed with which the car may be loaded. If the loading feature is properly cared for, this automatically takes care of unloading, as unloading is rarely complicated with fare collection. There are many factors entering into this problem, such as height and width of steps, size of loading platform and system of fare collection.

In Detroit we have several types of cars in operation and varying loading practice. In standard car types, we have the prepayment car with 32 sq.ft. of loading platform available. On this loading platform is an exit door which is often utilized as an extra entrance door near the starting terminal of the line. The standard trail car is center entrance and has but 8 sq.ft. available for loading space, though on this type of car the front exit door is also made use of for entrance near terminals and heavy loading points. Then there is the Peter Witt type car with large double-entrance doors and the front half of the car available as a loading platform, and finally the one-man single-truck car with but one door for both entrance and exit.

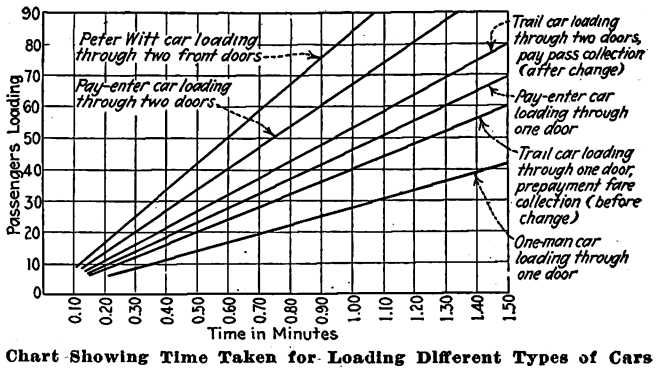


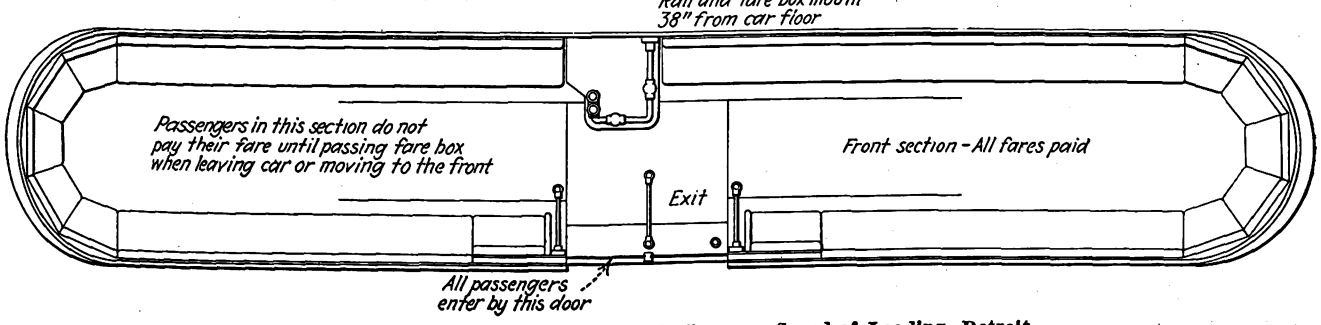
Chart Showing Time Taken for Loading Different Types of Cars

While there is an apparent difference in the loading efficiency of these various types of car the exact relation was unknown, and in order to establish this ratio a large number of time studies were made and the results plotted. From these plotted points lines were drawn, as shown in the graph presented herewith. In these studies the boarding time only was taken, as the principal factor being studied was loading speed in the congested areas with a view to improving this condition. The time consumed in opening and closing of doors was disregarded, as that element is a problem by itself. Observations were made also with small numbers of boarding passengers for the purpose of plotting a curve and establishing a ratio of the loading efficiency of the various types of car, as this factor would naturally have an effect on future car design.

Following this investigation, steps were taken to improve existing conditions on the trail cars and one-man cars. A few trail cars were changed so as to permit free entrance to the rear half of the car, as shown in the accompanying diagram. Passengers in this type of car pay their fares when they pass to the paid section of the car. This car has not been in service long enough to secure the full benefit of this arrangement, as the riders are not fully accustomed to it and there is still some confusion. However, the result has been to speed up loading. The comparative efficiencies of the old and new systems are shown above.

On the one-man cars another door was added at the front of the car, making an entrance and an exit door. This change has, of course, decreased the total time for loading and unloading by about 40 per cent, though the loading time considered by itself has not improved, as this depends upon the size of the loading space in the vestibule and the fare collection system.

There is still much to be done along this line of investigation to develop the highest degree of loading efficiency for city service. The height of step riser, which influences the angle at which the passenger climbs into the car, has an important bearing, as do also widths of doors, position of grab handles and number of doors.



Plan of Trailer Showing Changes Made to Increase Speed of Loading, Detroit

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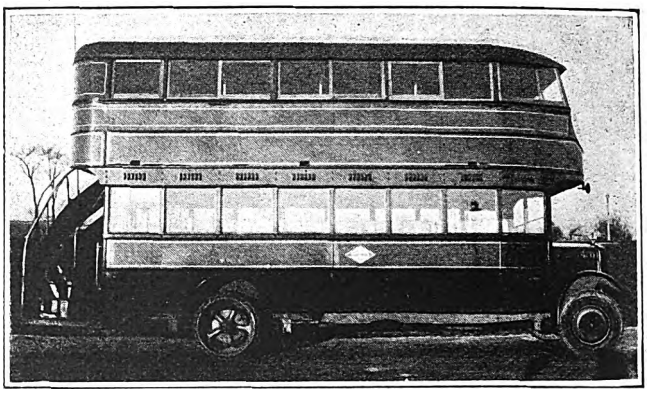
Upper Deck Inclosed for Winter

Removable Top for the Upper Deck of Milwaukee Buses Has Sliding Glass Windows—Roof Is Without Carlines Over the Aisle

BY J. H. LUCAS
Superintendent of Rolling Stock the Milwaukee Electric Railway & Light Company

A LIGHT-WEIGHT top has been designed by the Milwaukee Electric Railway & Light Company to inclose the upper deck on its Yellow Coach, model "Z" buses. This is so arranged that it can be easily put on in the fall and removed in the spring. A fully inclosed, removable top was preferred to semi-inclosed construction, because of the added protection afforded the passengers in the winter. The removable feature gives the passengers during the summer a chance to enjoy the warm air and view.

The upper-deck inclosure is tapered from the hand rails to the roof in order to minimize the danger of striking bridge braces, as well as to reduce the bulky appearance which straight sides would have produced. As these vehicles must operate under bridges having only 14 ft. 2 in. clearance, it was thought advisable to make the total height of the bus 14 ft., thus providing a clearance of 2 in. The height from the street level to the upper-deck floor is approximately 8 ft. 7 in. This limited the height from the top of the upper-deck floor to the under side of the roof to 5 ft. 4½ in. Framing of the top is of ash and the roof is ¼-in. Haskelite formed to shape and covered with canvas. No carlines are employed above the aisle, the roof being supported with cantilever carlines fastened to the letterboard at the sides, and tenoned into a ⅝-in. wood stringer at the aisle ends. Five aluminum stanchions support the aisle stringers and roof. The carlines are so located that it is unnecessary for passengers to pass under them in getting into or out of the seats.



To Protect Passengers in Winter This Bus of T. M. E. R. & L. Co. Has Been Equipped with a Removable Top

Upper-deck side sash were necessarily made to slide horizontally. To keep the vehicle as light as possible, they were glazed with single-strength glass. Advertising racks are placed above the windows. Eight electric lamps of 21 cp. provide the necessary lighting for the upper deck. A small vestibule with a swinging door opens into the aisle at the head of the stairs.

In building and mounting the top, the original construction of the upper deck was retained. The new part was built complete and mounted directly upon the steel hand rail of the bus, to which it is secured by bolts. Screening below the upper-deck hand rail was removed and replaced by permanent aluminum sheeting. Although no effort is made to heat this upper deck, it is more comfortable in the winter than is the uninclosed upper deck and serves to take care of the overflow in rush hours.

Billboard Advertising Changed Monthly*

ON ACCOUNT of the fact that steam railroad service is available to many of the patrons of the San Francisco-Sacramento Railroad, it has been necessary for this company to go more extensively into the matter of advertising than would ordinarily be the case. A large volume of passenger traffic between the cities of San Francisco and Sacramento has been built up during the last few years. The management believes that the use of billboard advertising has been instrumental in accomplishing this result.

The billboards are 10 ft. high and 25 ft. long. Hand-painted subjects are changed every month. Two of these are shown in accompanying illustrations. One is an advertisement describing the joint service from San Francisco to Lake Tahoe. This is a trip of slightly more than 200 miles, 93 of which is accomplished by rail and the remaining 111 miles by stage. Pierce-Arrow buses are used in this service. The second calls the attention to the state fair at Sacramento. The subject matter is presented so as readily to draw attention and is a high grade example of poster work.

Joint Railway and Bus Service Is Advertised on This Billboard. The San Francisco-Sacramento Railroad Believes that Much Traffic Has Been Secured by Billboard Advertising of This Type

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

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Association News & Discussions

Indiana Men Discuss Publicity

THE annual convention of the Indiana Public Utility Association, held in Indianapolis Jan. 22, was the largest ever held by the organization and was marked by the attendance of a large number of women employees.

"Uses of Advertising" was the subject of an address by W. H. Hodge, president of the Public Utility Advertising Association and in charge of advertising for the H. M. Byllesby Company of Chicago. He urged more advertising and more efficient advertising for adequate results. "The quality of utility advertising constantly is being improved," said Mr. Hodge. "No one can defend advertising that is not efficient. While we have no accurate records for 1924, it is estimated that utilities spent between $11,000,000 and $20,000,000 last year for advertising. Our own company will spend $326,000 this year for advertising. Seventy-three per cent of our advertising budget will go to newspapers. This medium must continue to be most important with us. We cannot compare our advertising with that of department stores, where the turnover averages five times annually. We turn our capital stock only about once every 5 years. We should, however, spend about 1 per cent of our gross. We have many things to tell the public.

"One thing we can tell it is of our service, and how it is to be used. Others are our merchandise appliances, securities, relation to community development, achievements during the past year, plans for the next, our rate schedules and our side of controversies. Our advertising should produce peace between the public and the utilities. It will cut the cost of marketing our securities 50 per cent. In one instance four displays and two letters, covering a 30-day period, brought our own company more than 2,000 inquiries."

W. S. Vivian of the Midwest Utilities Company of Chicago, in a talk on "Public Relations," said that 90 per cent of the world's troubles were due to misunderstandings. "We need to educate the public and our employees. Our employees should be able to buy our securities a little easier than the general public. We should encourage our employees to take part in civic affairs and be able to make talks on utilities when given the opportunity."

A bill now before the Legislature seeking to bring under the jurisdiction of the Indiana Public Service Commission all public utility holding companies was vigorously denounced by Gen. George H. Harries, vice-president of the H. M. Byllesby Company, speaking at the annual banquet. "The proposition is so involved that its enactment into a statute would make it impossible for utilities to borrow money to continue their business," he said. "The utilities would stagnate." He declared that the day of the small utility company is passing. He asserted that it is necessary for efficient and economical operation to maintain group management and control.

C. L. Henry, president Indianapolis & Cincinnati Traction Company, was re-elected president of the association. Other officers elected were S. E. Mulholland, Fort Wayne, and F. J. Haas, Evansville, vice-presidents; Frank C. Jordan, Indianapolis, treasurer; M. V. Robb, Indianapolis, secretary.

Central Accountants' Association

THE Central Electric Railway Accountants' Association will meet at the Claypool Hotel, Indianapolis, on Feb. 27. Following the meeting of the executive committee J. R. Cavanagh, superintendent of car service "Big Four" Railroad, will deliver a talk on "Car Service and per Diem," and C. E. Baker, auditor of Lima-Toledo Railroad, will talk on "Routine of Tracing Claims for Misloaded Freight to Ascertain the Party at Fault." In the afternoon there will be two general discussions, one on "The Advisability of Including Draft Authorities on Interline Statements" and another on "Progress Made in Operation of Buses in Connection with Electric Railways, as to Costs, Service, Depreciation and Tire Renewals." Dinner will be served at the Indianapolis Athletic Club, the evening closing with a theater party. On Saturday, Feb. 29, E. F. Eicks, auditor Fort Wayne, Van Wert & Lima Traction Company, will address the meeting on "Settlement of Interline Balances by Draft." A general talk on pepping up the association will be followed by the address of President Van Bibber, auditor of the Columbus, Newark & Zanesville Electric Railway.

American Association News

A.E.R.A. Headquarters to Move Feb. 21

THE date for moving the headquarters of the American Electric Railway Association to the Johns-Manville Building, Madison Avenue and 41st Street, New York City, from its present location at 8 West 40th Street, has been advanced to Feb. 21. As announced in this paper, the new offices will occupy the entire 14th floor of the building. There will be some 40 per cent more floor space than at the present location, and this is expected to relieve the present crowded condition.

Equipment

A MEETING of the committee on equipment of the Engineering Association was held at association headquarters, New York, Jan. 15 and 16. Those present were Pierre V. C. See, chairman; A. T. Clark, vice-chairman; Daniel Durie, sponsor; C. W. Squier, secretary; Walter S. Adams, W. W. Brown, R. S. Bull, J. L. Gould, J. M. Hipple, W. H. McAloney, A. D. McWhorter, J. F. Miller, E. D. Priest, Ralston B. Smyth, W. G. Stuck, H. S. Sweet, H. S. Williams, and V. D. Bethge representing Joseph C. McCune.

Sub-committees were appointed for the seven subjects which are being studied by this year's equipment committee. The chairmen and vice-chairmen of these committees are: No. 1, review of existing standards, C. W. Squier, chairman; H. S. Sweet, vice-chairman. No. 2, study of brake design, Joseph C. McCune, chairman; J. M. Yount, vice-chairman. No. 3, methods of car painting, R. S. Bull, chairman; W. G. Stuck, vice-chairman. No. 4, motor coach design, A. T. Clark, chairman; J. H. Lucas, vice-chairman. No. 5, devices for trolley contact, W. G. Stuck, chairman; A. D. McWhorter, vice-chairman. No. 6, study of gearing, W. W. Brown, chairman; Ralston B. Smyth, vice-chairman. No. 7, methods of reducing noise, H. S. Williams, chairman; M. O'Brien, vice-chairman. Tentative dates for future meetings of the equipment committee were set. The second meeting will be held at Cleveland March 16 and 17, and the third and final meeting of the committee at association headquarters, New York, May 21 and 22.

The various subjects assigned to the equipment committee for study and report this year were discussed and a procedure was outlined for handling. It was decided that among the standards which required revision were wheel mounting and chuck gages, journal bearing and wedge gages, tolerances for the bore of gears, clearances for armature bearings and the specifications for proof testing of forgings.

Representatives of the motor coach division of the Society of Automotive Engineers were present, and it was decided that this year's work should be devoted primarily to outlining ruling dimensions and nomenclature for bus body construction. The motor coach division of the S.A.E. is to make a study of information obtained by last year's special committee and have representatives present at the next meeting of the equipment committee, so that definite recommendations can be made.

Questionnaires are to be sent out in connection with subjects Nos. 1, 3, and 6 and a definite effort will be made to get a full reply from member companies.

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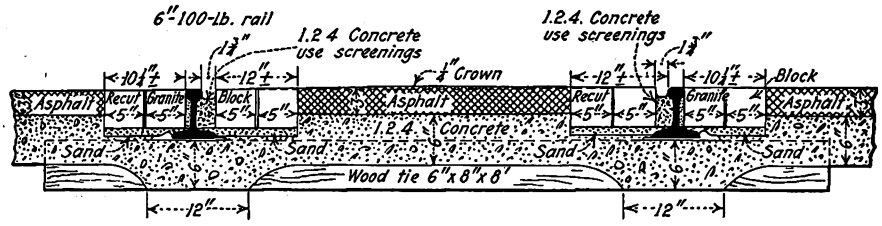
Maintenance of Equipment

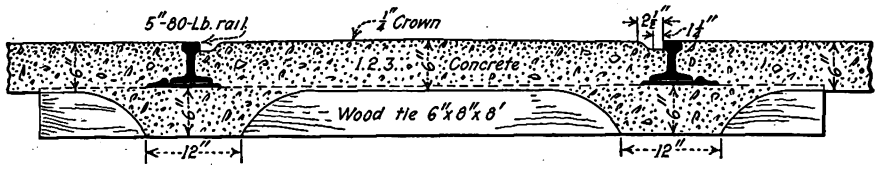
Low-Crowned Pavement

WHEREVER paving has to be laid between rails, the Connecticut Company is now laying as flat a surface as can be provided and yet shed water. The purpose of this type of construction is to make passage over the track easy for automobiles.

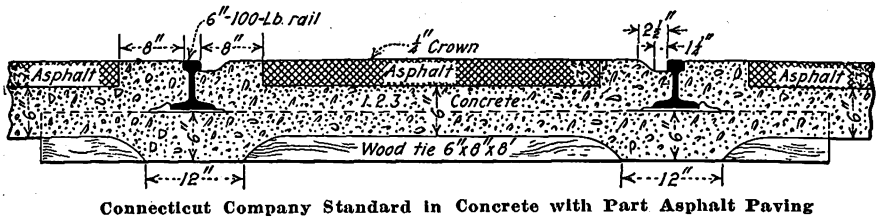
Most of the track of the Connecticut Company, even in large cities, is laid with plain girder or T-rail, the present standards for this rail being A.E.R.A. 5-in. 80-lb. A.S.C.E. and the 6-in. 100-lb. A.R.A. type A. This rail is laid on wooden ties with tilted tie plates and seam-welded joints, as described in the issue of this paper for April 5, 1924, page 537. When the track is laid in paved streets on a good sand or gravel soil, no ballast is used under the ties. The sub-base is simply rolled before the track is laid. When the sub-soil has poor drainage properties, 6 in. of ballast is placed under the ties, and tile drains are installed, if necessary.



Connecticut Company Standard with Granite Blocks Against Rail



Connecticut Company Standard in Monolithic Concrete



Connecticut Company Standard in Concrete with Part Asphalt Paving

The accompanying drawings show the three standard types of track construction of the company.

The first is used extensively in the city of New Haven. The rail illustrated is a 6-in. 100-lb. section, but the construction shown can be adapted to a 5-in. 80-lb. rail, although this construction is not recommended for standard practice.

In this type of track construction with the granite blocks laid on each side of the rail, the blocks are usually recut to the size shown and rest on a sand and cement cushion. Space between the inside of the rail and the nearest block is filled with a rich mix of fine aggregate, tamped in, and a groove 1¾ in. wide is provided to take care of the wheel flange. Grouting is used with the granite blocks, and the surface between the rails up to the granite block is laid with asphalt with a ¼-in. crown.

The second section shows a monolithic concrete pavement and substructure. In this construction the groove on the inside of the rail for the wheel flange is made by a molding strip, which is pounded down flush with the head of the rail, just after the concrete has been poured. This construction is equally well adapted to 6-in. 100-lb. T-rail.

The third section is very similar to the second, except that asphalt is laid between the rails up to a distance of 8 in. on each side of the rail.

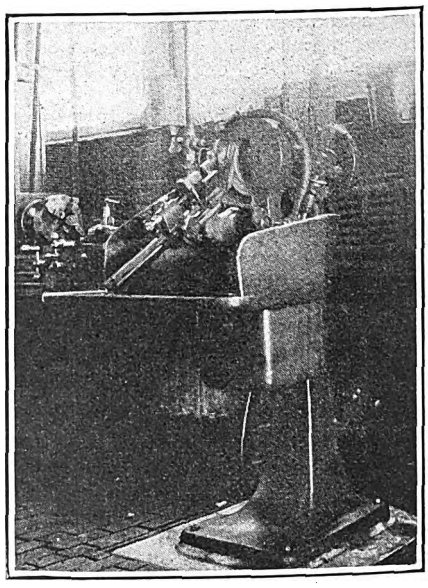
In general, the choice of these different constructions depends on the preference of the city engineer. The first has the advantage from the railway standpoint that joints can more easily be repaired. In no construction is the asphalt carried up to the rail.

The standard rail joint of the company, except in special work, is made with 20-in. machined bars, seam-welded to the rail, as described in the issue of April 5, already mentioned. Seam-welding is also used between the base of the rail and the joint base plates. The company has also recently been using thermit for some of its T-rail construction in paved streets, about 200 thermit joints having been laid during the past summer in New Haven.

In special work, bolted joints are used with rails spiked directly to ties.

Careful Grinding Prolongs Life of Drills

ONE of the important machines that permit the mechanical department of the Altoona & Logan Valley Electric Railway, Altoona, Pa., to operate efficiently is a Grand Rap-



Drill Grinder in Altoona Shop Has Proved a Good Investment

ids drill grinder. Experience has shown that the use of this machine not only prolongs the life of the drills by making them more accurate and equalizing the strain in the metal, but also enables the shop men to drill better holes.

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Installing Resistors Inside Cars

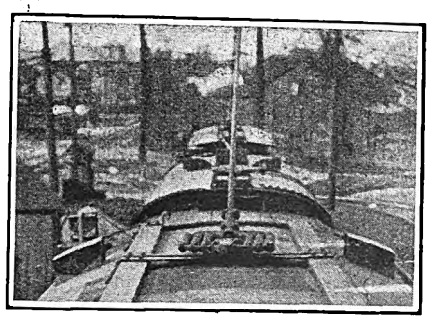
DURING the winter and spring months, the Northern States Power Company, Fargo, N. D., experienced considerable trouble from short circuits caused by melting snow and water on the tracks, burning off lead wires at resistors. As the space for installation of resistors on safety cars was quite limited, the company tried removing these from beneath the floor and placing them inside the car at one end just back of the operator. A partition 3 ft. high was placed ahead of the front seat to protect the operator and passengers from draft, and this also acts as a shield to prevent passengers from coming in contact with the resistors, either while seated or standing near this point.

The resistors are insulated with ¼-in. asbestos lumber, and the tops are protected by a metal cover made in the shape of an inverted V. Twenty-four 1-in. holes are punched in the cover to allow the heat to escape freely. A fine screen is soldered to the underside of these holes, which prevents the entrance of particles which might damage the resistors. The angle-iron framework and cover were painted black. A red lettered sign reads "Danger—550 volts."

As thermostatic control is provided for the electric car heaters this method of installing the resistors inside has materially reduced the energy used. The cost for making the change was not excessive, and pull-ins from burnt-off wires have been done away with entirely.

Divided Trolley Board Gives Better Clearance

SOME time ago the Altoona & Logan Valley Electric Railway, Altoona, Pa., acquired a number of nearly new cars which had formerly belonged to another railway operated under the same management. These cars were somewhat higher than the standard cars used in Altoona, and it was found that there was considerable difficulty on account of low clearance under bridges. To increase the clearance the trolley board was divided into two strips 4 ft. apart. Flat steel bars between these strips support the trolley base. The latter is the flattest type which is now on the market. The combination of these methods of reducing the overall height has resulted in giving sufficient clearance and these cars are now operated without difficulty in Altoona.



Trolley Base Is Supported on Flat Steel Bars Between Wood Strips 4 Ft. Apart

Overhauling Car Cables

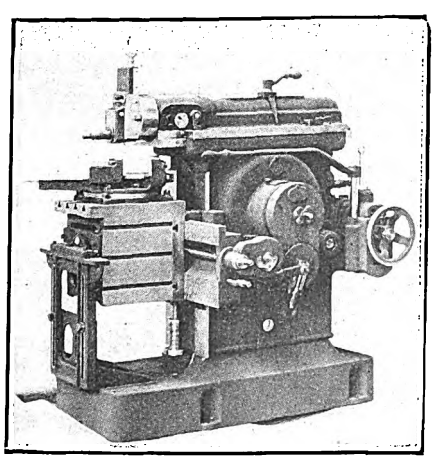
APPROXIMATELY 25 per cent of the cars overhauled at the Wolf Street shop of the New York State Railways in Syracuse have required new cables. In replacing these, No. 4 rubber-covered, double-braided seven-strand wire has been substituted for the No. 6 size previously used. Two coverings of canvas hose are also used instead of a single one. After applying, the canvas is given three coats of black insulating paint. This is allowed to dry for 24 hours, and the cable is then taped its entire length with 2-in. friction tape. After taping, another coat of insulating paint is applied.

In wiring with this cable, it is cleated to the two center sills running the length of the car. This brings it parallel with the leads as they come from the motor. Particular care is taken not to cleat the cable to the floor, as some trouble has been experienced, due to screws from the floor slats entering the sheath and causing damage. Knuckle-joint connectors are used on all motor leads. These are covered with ⅝-in. rubber tubing and are fastened to the main sill with wooden cleats.

New Equipment Available

Back-Geared Shapers

A HEAVY-DUTY 16-in. shaper, driven by a single pulley through a selective type back gear arrangement has recently been brought out by the Stockbridge Machine Company, Worcester, Mass. The geared drive with a high ratio gearing gives ample power for heavy roughing cuts. The gear arrangement is of the selective sliding-gear type, with a shift similar to that used in automobile practice. There are four changes of speed in the gear box. With back gears this gives eight speeds in all. The gears are of heat-treated steel, and can be run in oil or light grease. The teeth are pointed to permit of easy shifting.



A Heavy-Duty Back-Geared Shaper with Eight Speeds

An automobile-type driving clutch is used for starting and stopping the machine. When stopped, it locks the shaper against any possibility of starting. The clutch is operated by the horizontal lever which is extended from the front of the machine within easy reach of the operator. The ram can be positioned by moving the same lever back and forth. A handwheel is provided on the side of the machine for setting the ram by hand. It is unnecessary to stop the machine to change the speed. The feed always operates on the return of the ram and never feeds on the cut, which eliminates danger of breakage.

The base of the shaper has been made unusually deep in order to provide for deep ribs and give extreme rigidity. This deep base carries a table support for the knee. The vise is constructed to eliminate overhang of the front jaw. It is also designed to keep the work close to the top of the table. The body of the vise stands up but 4½ in. from the top of the table. The vise jaws are 12 in. x 2½ in., and they open 12 in. The machine can be furnished with automatic down-feed.

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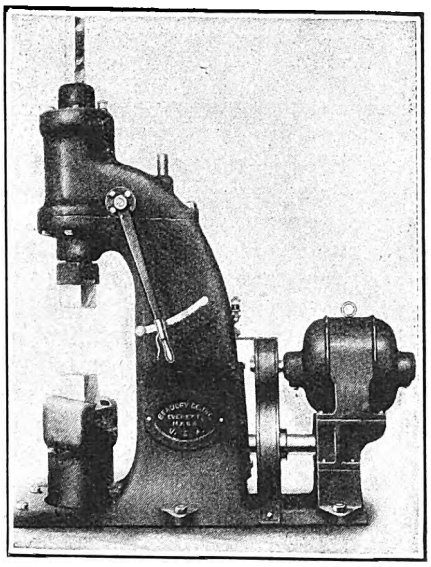
Improved Nickelchrome Wire for Heaters

AN improved form of nickelchrome wire is being marketed under the trade name of Kerma by the Electrical Alloy Company, Morristown, N. J. This wire is made particularly for extremely high and continuous temperatures, and is recommended especially for electric heating elements of car heaters. It is said to be free from oxides and has no weak spots in the structure which would cause breakage.

Six Small Sizes of Air Hammers

A NEW line of upright air hammers is being marketed by the Beaudry Company, Inc., Everett, Mass. These tools are furnished with rams weighing from 100 to 1,200 lb. Particular attention has been given in the design of the frame to provide for resistance to shock



Motor-Driven Air Hammer

and jar of the blow. Anvils are separate, and are supported on their own foundation. This eliminates shock to the hammer frame. The hammer is provided with both tight and loose pulleys, so that when belt drive is used no countershaft is necessary. The machines are also arranged for motor mounting with individual drive. The blow can be regulated by either treadle or hand lever.

The form of the ram is such that the greater part of the weight is concentrated in a bar of large diameter. This allows a large amount of room for handling, due to its being guided by passing through both the upper and lower cylinder heads. The head is entirely separate from the bar, and is readily removable. It is held securely to the ram by wedge clamping rings. The cushioning of the ram is done entirely by air, avoiding springs or rubber cushions.

The compressor piston is inclosed in the hammer frame and is mounted in a vertical position. The reciprocating movement of the piston is obtained by a crank on the end of the motor-driving shaft. In ascending the piston compresses air for operation which flows into the ram cylinder, sending the ram upward with great speed. When near the top air is trapped so as to form a cushion and cause the ram to rebound. The force of rebounding combined with the suction of the compressor piston gives the energy for striking a heavy blow.

Portable Arc-Welding Set

A PORTABLE motor-generator type of arc-welding machine has been added to the line of Wilson Welder & Metal Company, Inc., Hoboken, N. J. The set is particularly useful for light welding work in railway repair shops. It has a range of adjustments from 75 amp. to 250 amp. in small steps and is intended for rapid work using electrodes up to ¼ in. diameter. The generator is of the field-control type, with current regulations such that when welding at full load the current does not rise above 10 per cent of the short circuit value. As ballast resistors are not used and as the windings are of low resistance, the voltage generated is practically that of the arc plus the drop in the welding leads. The machine is mounted on a base of channels welded together, and is equipped with roller-bearing steel wheels. It is 52 in. long, 40 in. high, 30 in. wide and weighs 1,260 lb.

Roller Bearings for Line Shaft Hangers

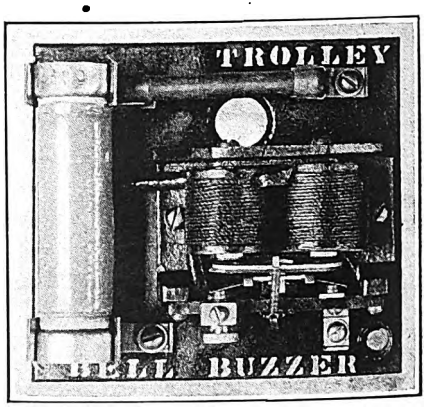
THE Dodge Manufacturing Corporation, Mishawaka, Ind., has placed on the market a line-shaft bearing embodying the Timken tapered roller bearing, as well as several new features of construction. This line-shaft bearing consists of five parts. Two tapered roller bearings are mounted on a steel tube, ground and slotted and fitted to an accurately machined housing. The ends of the steel tube are threaded to receive clamping collars. The mounting of the tapered roller bearing insures full utilization for both radial and thrust loads. The sleeve on which the bearings are mounted extends from end to end of the housing and liberal grease compartments are provided inside the housing and outside the tube. The outer ends of the bearings are protected against dust by special metallic grease seals which eliminate friction and prevent dust from working in or the lubricants from working out. The grease seals take the place of felt washers or packing.

The erection of the line-shaft bearing is accomplished by slipping the bearing over the shaft and setting up the clamping screw in each of the clamping collars. To remove it in order to make any necessary repairs the screws in the collars are loosened and the bearings can then be slipped off the shaft.

Interrupter Unit for Buzzers

AN IMPROVED design of interrupter for use on 600-volt circuits with buzzers has been brought out by the Consolidated Car Heating Company, Albany, N. Y. The two coils of the interrupter are in series and the hinged armature has a nichrome contact strip. In order to provide flexibility the contact strip is not rigidly connected to the armature, avoiding binding that might prevent proper contact. The two stationary contacts are adjustable and both have tungsten points.

A glazed type of resistance is



An Interrupter Unit for Buzzer Circuits with Flexible Contact Strip

mounted together with a fuse in the same case as the interrupter unit. This case is of sheet steel about 6 in. square. The same fuse and resistance are used for single stroke bells by taking a tap off ahead of the interrupter after passing through the resistance. Separate terminals are provided for buzzers and bells.

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The News of the Industry

Wages Remain Same

Detroit Municipal Employees Will Not Press Demands for Higher Wage —Former Status Restored

The appeal to the courts in the case of the increased wage demand of the street railway employees in Detroit, made through the union, has been abandoned and conditions restored to exactly the same status that existed before the demand for more pay was made, or the same status held since the establishment of the Detroit Municipal Railway during the administration of James Couzens as Mayor. It has been announced that although the union platform employees of the D. S. R. won their demand that Judge Richter's decision last June stand in its entirety, the men will not press their wage demands at the present time. Judge Richter's ruling ordered the Street Railway Commission to arbitrate with the men through their representatives. The commission will withdraw its appeal pending before the Michigan Supreme Court, which was made following Judge Richter's decision that the commission was bound to arbitrate wages and working conditions.

The men agreed to withdraw their demands for increased wages and arbitration, acting at the request of Mayor John W. Smith. The commission believed that the men were fully and completely protected under the city charter. On the other hand, a majority of the men persisted that their relations with the city must be handled through their union officials, and the difference of opinion led to the appeal to the courts. The commission had insisted, up to the time of the conference with Mayor Smith, that as a precedent to withdrawing the appeal the men seek an order vacating Judge Richter's decision. With the withdrawal of the men's demands it was considered that there was no present case for Judge Richter's decision to operate upon.

A resolution adopted by the commission on Feb. 7, 1923, outlined wages and working conditions and provided for arbitration of disputes. This resolution, rescinded last year, is again reinstated without the amendments which constituted the new demands made by the men last April. It is cited that the resolution does not bear the signatures of the union officials and therefore is not a signed contract.

It is considered that Judge Richter's decision binds the commission to arbitrate with any association of the men, including the D. S. R. Trainmen's Association, in which non-union platform employees are members. Although these constitute a minority, according to the commission, that body has always been willing to arbitrate with the men through this association.

The section of the resolution of Feb. 7 which caused the dispute provides that in all cases of grievances or disputes the employees shall be permitted to be represented in hearings before the officer or officers or commissioners of the street railway department by the representatives of the said employees chosen by the associated employees. In case of failure of adjustment of said case, or cases, by or through said hearings, said employees may have such recourse as is provided in Section 19 of the street railway chapter of the charter, providing for arbitration of disputes.

Georgia Interurban Suspension Lifted

Marietta Line Resumes Operation Following Banning of Jitneys and Denial of Receivership Suit—Atlanta Jitney Status Acute —Anti-Jitney Ordinance Passed in East Lake

SERVICE was resumed on the 16-mile line of the Atlanta Northern Railway between Atlanta and Marietta, Ga., on Jan. 24, following a suspension of 10 days. The portion of the track which was torn up when the road ceased operating was repaired and cars began operating on the old schedules. Decision to resume the service came after the city of Marietta had passed an ordinance banning jitneys and buses from competing with the railway and after a plea by Judge Morris of Marietta to throw the road into receivership had been denied by the Fulton Superior Court.

Judge Morris insisted that the Atlanta Northern Railway, having suspended its service to Marietta on Jan. 14 by removing its cars and tearing up a section of the track, should surrender its charter. He contended that the company had violated the state law in suspending service without permission from the State Public Service Commission and asked that the court appoint a receiver to operate the line. The Atlanta Northern Railway, however, contended that it could not be compelled to operate at a financial loss. Its defense was that since the establishment of the line in 1905 its revenues had been insufficient to pay operating expenses, must less dividends. It also contended that as Judge Morris was not a stockholder in the company he had no right to bring suit to compel a receivership.

Since then a "fast" bill of exceptions, appealing to the State Supreme Court from the ruling of Judge W. D. Ellis, which denied pleas of Judge Newt A. Morris for injunction and receivership against the Atlanta Northern Railway, was signed by Judge Ellis. Such a bill gives the appeal the right of way in the Supreme Court, it is pointed out, and calls for an early hearing. Judge Morris contends that if the Supreme Court sustains his contentions it will be to grant an injunction forbidding the railway from tearing up its tracks or discontinuing service in the future without permission from the State Public Service Commission.

Hearings on the petition began Jan. 19 and as soon as the decision of the court was handed down denying the suit a committee from the Marietta Chamber of Commerce got in touch with officials of the Georgia Railway & Power Company, of which the Atlanta Northern is a subsidiary, and a conference was arranged, at which it was agreed to resume service. Under a special extension of time granted the jitney operators by the Marietta Council they were permitted to operate until Jan. 28, at which time the new anti-jitney law ordinance becomes effective. It is expected that the jitney operators will attempt to secure a permanent injunction restraining the Marietta Council from enforcing its ordinance and permitting them to operate.

The Georgia Railway & Power Company, however, has won its point, namely, the exclusion of jitney and bus transportation between Atlanta and Marietta and the elimination of what it has termed for months "unfair competition."

Not only in the city of Marietta is the jitney being banned but also in Atlanta itself. An ordinance was recently introduced before the City Council there abolishing jitneys from the city streets. The denunciation of the jitney and the demands that it be banned featured the first hearing on the question held at the City Hall on Jan. 23. The meeting was called to order by Alderman J. L. McLendon, chairman of the new traction committee of the City Council. A feature of the meeting was the reading of many resolutions from leading citizens, business, civic and other organizations asking that the ordinance banning jitneys from Atlanta streets be passed.

A counter attack upon the power company was made under the leadership of the president of the Atlanta Jitney Bus Association. Alderman McLendon decided that since public opinion was so strongly in favor of passing the anti-jitney ordinance no more hearings would be held, but that the matter would be taken up directly at the next meeting of the City Council.

The entire elimination of jitneys in Atlanta is expected to follow the banning of them from East Lake, a suburb of Atlanta, on Jan. 21 as a result of the passing of an anti-jitney ordinance by the Town Council.

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New Company to Operate Rockford's Railway System

The City Council of Rockford, Ill., has instructed its legal department to draft a new ordinance which will give T. M. Ellis, Jr., head of the newly organized Rockford Public Service Company, a franchise to operate a traction system. Mr. Ellis made a plea for this action and it was supported by a letter from Mayor Herman Hallstrom. The Mayor charged that the effort to secure a new franchise for the Rockford City Traction Company, which now operates the system, was insincere. Mr. Ellis is president and general manager of the Beloit Traction Company and the Kewanee Public Service Company. He has offered to accept the terms drawn up by the City Council and rejected by the Rockford City Traction Company.

The dispute in Rockford between the city and the railway dates back to October, 1922, when the company's franchise expired. At that time a new 20-year franchise was sought. In return for this new franchise the Rockford City Council demanded certain pledges from the company, among them a guarantee for the expenditure of $750,000, to be spread over a period of 20 years, covering the construction of new lines, new equipment and replacement of considerable old trackage. At first the city insisted on a 10-year franchise, but later agreed to make the franchise continue for 20 years providing all its requirements were met by the company. Mr. Ellis has agreed to accept the franchise drawn up by the city, meet all its terms, equip the system with new rolling stock and machinery, extend the lines into new territory and rehabilitate the entire property. Immediate improvement plans call for the purchase of 25 buses to be used as feeders to the railway system. He further agreed to buy the complete equipment owned by the Rockford company at a price to be fixed by appraisers. He offered to furnish a guarantee of $750,000 demanded by the Council for improvements to be made within a certain specified time.

$105,000,000 Plan for Chicago's Traction System

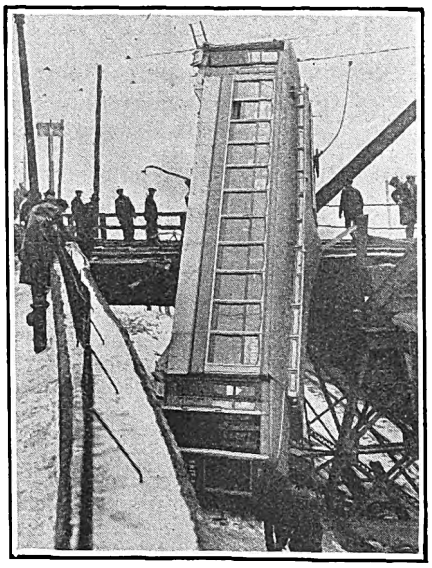
Convinced that Chicago's proposed "half billion dollar transportation system" will be kept from fruition by the cries of rival politicians, Henry A. Blair, president of the Chicago Surface Lines, has made a new traction proposal workable with private capital and dependent on long-term franchises. The plan calls for $105,000,000 expenditures in 6 years, including the city's $40,000,000 traction fund for a subway.

The new feature suggested is a 4-mile system of pedestrian subways or sidewalk plazas designed by L. A. Drum, engineer, who laid out the passageway linking the Pennsylvania Station with Herald Square in New York. These would radiate from subway stations to nearly all big stores and stations and would be built at a cost of $175 to $250 a front foot to the abutting property.

Other proposals are for a four-track subway in State Street from 19th Street to Division Street and two two-track subways in east and west boulevards for use of elevated trains and two-car unit surface cars. The plan calls for $22,000,000 financing by the surface lines and $44,550,000 by the elevated, the latter's program being one for which Samuel Insull has asked the city for authority to proceed.

Twenty Passengers Hurt in New Jersey Accident

A car of the Public Service Railway bound on Jan. 22 from Passaic to Hoboken through Jersey City jumped from the elevated trestle on First Street and dropped head first to the ground, carrying about 40 passengers with it to the street below. The car stood on end, as shown in the illustration, piling the passengers at the bottom. Twenty of the passengers were injured, but none of them seriously.



International News Reel

Jersey Car After Leaving Trestle

Increased Rates Necessary

The New York State Railways filed with the Public Service Commission on Jan. 27 a petition for permission to put into effect on short notice an increase in commutation rates on its Rochester & Eastern division and its Sodus Bay division. The present rates have been in effect since Aug. 28, 1920. The proposed rates for commutation service are as follows: On 54-trip commutation ticket books and 46-trip school ticket books the rate of 2 cents per mile for distances of 5 miles or less, to and including 12 miles; 1¾ cents per mile for distances beyond 12 miles to and including 24 miles; 1½ cents per mile for distances beyond 24 miles to and including 43 miles, a fraction of a mile to be counted as a full mile. It is proposed to increase the minimum fare for children from 3 to 5 cents. It is stated in the petition that the commutation earnings on the two divisions for the year ending Oct. 31, 1924, aggregated $38,697, or 10.99 per cent of the total passenger revenue of the lines. The cost of the commutation service is estimated by the road at approximately $43,000.

Transportation Plan for Los Angeles Awaited

In a preliminary statement issued by traffic survey engineers of the engineering firm of Kelker, DeLeuw & Company of Chicago, Los Angeles by making provision for transit facilities can still keep up the pace of its rapid growth and arrange for the accommodation of 4,000,000 population within an area of 10 miles of Pershing Square. This firm has been engaged during the past year in making transportation surveys for the city of Los Angeles and the county of Los Angeles, the joint survey to cost the two governments $40,000, with expenses divided in half. The survey was first undertaken on May 1, 1924, and its purpose was to provide a similar transportation system as prepared for Chicago by these engineers.

The Los Angeles report contemplates rapid transit by subway and elevated systems, supplemented by surface cars and buses, to distribute the population throughout the metropolitan district outside of the central urban area.

The statement recommended in part that the suburban rapid transit railroads should be designed to provide high-speed service between the centers of the suburban cities and the central cities. On the urban rapid transit railroads over-all speeds of from 18 to 25 m.p.h. could be maintained. On the interurban rapid transit railroad over-all speeds from 25 to 40 m.p.h. could be maintained.

It is anticipated that the complete transportation report of the engineers will be filed soon.

Want Buses in Massachusetts Under City Control

Both electric railway companies in Massachusetts and their employees have taken a united stand this year in demanding of the Massachusetts Legislature that a law be enacted placing the jitneys and buses under the control of the local city and town authorities, and under the Metropolitan District Commission when the use of boulevards is involved. They have a bill which calls for the licensing of motor cars engaging in the passenger business and their regulation as common carriers.

It is the opinion of the railway interests that they can compete with the buses if the two classes of transportation are placed under the same regulations and can compete on comparable bases. The Amalgamated Association is giving wholehearted support to this proposition. It was represented at the Boston conference by 12 union presidents and by John H. Reardon, international vice-president. Among the representatives of railway managements were Fred A. Cummings of the Eastern Massachusetts Street Railway; Edward Dana of the Boston Elevated; Clark V. Wood of the Worcester Consolidated and the Springfield Street Railway; L. D. Pellissier of the Holyoke Street Railway; Clinton Q. Richmond of the Pittsfield Street Railway; Ralph D. Hood of the Massachusetts Northeastern Street Railway, and representatives from the Boston & Worcester and the Middlessex & Boston Street Railways.

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Operating Offer Made by Interborough, New York

Frank Hedley, president and general manager of the Interborough Rapid Transit Company, New York City, in a letter sent to members of the State Legislature, states that the company is willing to operate 3-cent feeder buses, in conjunction with its existing system, and also to provide 8-cent buses as a rush-hour expedient on streets occupied by rapid transit lines. He said the Interborough was prepared to examine the matter of free transfers from buses to elevated lines and subways.

Mr. Hedley says the establishment of a comprehensive bus system in this city in competition with Interborough subways and elevated lines in which the city of New York has a large financial interest will result in annual losses to those lines of from $1,000,000 to $2,000,000.

Mr. Hedley requests the Legislature to defer action on pending application for bus franchises for a period sufficient to permit the Interborough, after conference with the Board of Transportation and experts of the Legislature, to formulate a plan for bus operation for the consideration of the State Legislature.

Fare Increase Impends at Newburgh

The Newburgh Public Service Corporation, Newburgh, N. Y., has filed an application with the Public Service Commission for permission to increase the fares on its lines upon short notice. The corporation claims that the 7-cent fare now in force is insufficient to yield a reasonable compensation for the service rendered and asks the commission to determine reasonable and just charges. The petition includes a copy of the resolution of the Newburgh City Council consenting to an increase from 7 to 10 cents. Transportation service in Newburgh is entirely by bus except for one line operated out to Orange Lake.

Utility Regulation Bills Before Indiana Legislature

Members of the Senate committee of the Indiana Legislature having to do with utility legislation will carry to the floor of the Senate the fight being waged on measures dealing with more stringent regulation of utilities by the Indiana Public Service Commission, according to action taken on Jan. 24 by the committee. Another bill to tighten the regulation of utilities went into the House on Jan. 23. The measure provides that no utility shall place a valuation on its securities or shall assert a valuation for rate-making purposes beyond the assessed value of the property for tax purposes. The committee will recommend for passage the bill which would provide that utility depreciation funds can be used only in replacement of equipment or in new construction and another bill which would provide that utilities under regulation of the commission must agree to appeal rate case decisions to the state Supreme Court before appealing to the federal court.

Further action will be taken by the committee on the bill which would make a utility of all companies or organizations holding more than 50 per cent of the stock of a public utility and bring such holding company under the regulation of the public service commission.

Co-ordination of Service Proposed in Norfolk

The Virginia Railway & Power Company is ready to submit a plan for the operation of buses in Norfolk, Va., in co-ordination with or as an auxiliary of its railway system there. It is understood that the position of the company is:

That the company is willing to begin the operation of buses without additional legislation from the Virginia Assembly.

That the company is willing to reimburse owners of bus routes which it takes over on the appraised value of the equipment by a board of arbitration if the company and the owners were unable to agree.

That buses would be operated that would insure comfort and safety and that trolli-buses be used on several routes.

Bus Legislation Proposed for St. Louis

The public utilities committee of the St. Louis Board of Aldermen has voted to file the bill for the regulation of buses prepared by C. E. Smith, consulting engineer for the city. Mr. Smith will be asked to draft another measure not quite so drastic to provide that the Aldermen and not the Board of Public Service shall issue bus permits. It will fix heavy taxes to be paid by the bus company as compensation to the city. An endeavor will also be made to have buses classed as public utilities and made subject to the regulation of the Missouri Public Service Commission.

Chicago Surface Lines Creates New Division

Organization of a new traffic division covering the downtown district has been effected by the Chicago Surface Lines to work in closer co-operation with the police for swifter movement of traffic. The new division began functioning on Jan. 5 as a contribution to several months of traffic innovations which proved notable successes for street car, pedestrian and vehicular traffic. In all particulars the new division is a crack outfit. It is headed by P. J. Duffy as superintendent, one of the oldest officials on the Surface Lines. Twelve efficient supervisors were assigned to him. The force was presented at police traffic headquarters so that it will function in a friendly spirit with traffic policemen.

Extra Appropriation Approved in Cincinnati

On recommendation of the finance committee the City Council of Cincinnati, Ohio, passed the semi-annual appropriation ordinance which includes an additional allowance of $20,000 for the solicitor's office. The major portion of the additional appropriation will be used to defray expenses of litigation to obtain forfeiture of the present franchise of the Cincinnati Traction Company, in the event such action becomes necessary. When called upon to explain this additional allotment at the time the appropriation ordinance was drawn, Mayor Carrel said the money was needed to carry out his previously announced intention of bringing suit to forfeit the existing traction franchise.

This announcement came as a climax to the fruitless negotiations over the proposed new traction franchise. It drew the fire of certain members of Council, with the result that the request for the additional funds was referred to the finance committee. Realizing that rejection of the appropriation by Council would defeat his plan to try to forfeit the existing traction franchise, Mayor Carrel and Frank Bowman, newly appointed city solicitor, together with members of the citizens' traction committee, attended the special meeting of the finance committee and urged the committee to act favorably on the appropriation. After the finance committee had acted favorably on the additional appropriation, Council went into special session and passed the ordinance in its entirety.

Utilities Measures Before California Legislature

Considerable activity has developed at Sacramento, Cal., during the recent session of the Legislature. Efforts have been exerted to present a bill to reduce the taxes of public utilities. A constitutional amendment was introduced in the Assembly on Jan. 15 proposing to tax the gross earnings of the publicly owned utilities on the same basis as privately owned utilities are now taxed by the State of California. If approved the measure would place a state tax on the earnings of the San Francisco Municipal Railway and other similar enterprises. A similar measure was passed by a previous Legislature, but was voted down by the people. There is also pending a bill to regulate the size of buses using the public state highways and roads for passenger service.

Jitneys Attached Again in Detroit

The Police Department at Detroit, Mich., has been directed by the City Council to enforce the old ordinance governing the operation of jitneys in the city. This measure requires the jitneys to carry city licenses. The jitneys were operated up to the end of 1924 without licenses. This they did under an injunction from the Circuit Court, issued when the new jitney ordinance was blocked. The Circuit Court's decision was appealed by the city, but it is reported that a decision may not be reached by the Supreme Court for another year.

The old license ordinance was never rescinded and licenses and records under its provisions have been prepared by the Corporation Counsel's office. The Comptroller's office says it has no records of the number of buses operated in the city or of their routes. It has scant information on the matter of the payment of the city tax of 1 cent a mile.

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News Notes

Seeks Extension of Bus Service.—The Traction Bus Company, subsidiary of the Johnstown Traction Company, Johnstown, Pa., seeks to extend its bus service to Boswell, a distance of 4 miles. Two buses will be used. A hearing is scheduled Feb. 5.

Buses as Extensions.—The St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., opened its West Florissant Avenue bus lines on Jan. 13. The buses will operate as extensions of the Bellefontaine Street railway line. Transfers will be issued to and from the street cars. The bus fare will be 10 cents with no extra charge for a street car transfer. A street car rider can obtain a bus transfer for the payment of 3 cents in addition to the regular street car fare of 7 cents. The St. Louis Bus Company has been operating a line on Natural Bridge Avenue between the terminus of the Natural Bridge Street car and Pine Lawn.

Will Make Survey.—United States Judge F. E. Kennamer refused on Jan. 22 to discharge John W. Shartel, president of the Oklahoma Railway, as one of the receivers of the company as demanded by the city attorney of Oklahoma City. The court has granted the receivers permission to employ Stone & Webster, Inc., Boston, to make a survey of the conditions surrounding the operation of the railway and to make an expenditure amounting to $100,000 to improve the roadbeds and service of the company's lines. It is announced that Stone & Webster will be represented in their work for the receivers by George H. Clifford, Fort Worth, manager of the Northern Texas Traction Company, a Stone & Webster property, which last year was awarded the Coffin prize.

Good Will in "Ads."—The Des Moines City Railway, Des Moines, Iowa, is confining a great deal of its advertising space to the building of good will in the rotogravure section of the Des Moines *Register*. One of its recent "ads" was a two-column display devoted to giving directions for finding public places of interest.

Bus Route Sanctioned. — The Public Utilities Commission of the District of Columbia recently authorized the Washington Railway & Electric Company to operate a bus route from Nichols Avenue and Good Hope Road, S. E., to Blue Plains, and to Nichols and Valley Avenues. The commission at the same time ordered that the rate of fare on these buses be the same as the rate of fare on the railway lines or such other fare as may be prescribed by the commission.

More Time and Money Needed.—City Solicitor Gaffney of Philadelphia, Pa., has recommended that funds be provided for further investigation of problems involved in the Philadelphia Rapid Transit Company's fare question. He estimates the cost at $75,000. In a letter to Mayor Kendrick, which the Mayor sent to the Council, Mr. Gaffney said that about 4 months more of investigation would be needed. He also expressed the opinion that the company's financial condition this year might be such as to justify a decrease in the present 8-cent rate. Some months ago the commission adjourned hearings on the protest of the city against the increase in fares from four tickets for 25 cents to two tickets for 15 cents. At that time Mr. Gaffney sought a postponement.

Ordinances Pass Second Reading.—An ordinance calling for an agreement between the city and the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the construction of the Chestnut Street subway and an ordinance granting franchises for three bus lines in the populous sections of the city passed second reading in the Council on Jan. 22.

Two Years More Allowed for Construction.—Extension for 2 years of the time within which the Frontier Electric Railway, Buffalo, N. Y., shall start and finish its proposed line between Buffalo and Niagara Falls is sought in a bill introduced into the Legislature by Senator Hickey of Buffalo. Some years ago the Frontier Electric Railway acquired the right-of-way between Buffalo and Niagara Falls. Part of the right-of-way is occupied by the Buffalo-Niagara Falls high-speed division of the International Railway, Buffalo.

Buses at Newport News Taken Over by Railway. — The Newport News & Hampton Railway, Gas & Electric Company has recently taken over passenger bus lines operating over routes in Newport News, Va., in competition with its railway lines. The plan is to replace the bus equipment with newer and more economical motor cars. At this time there are no plans for extending the bus lines to new territory. Practically all of the populous parts of Newport News which are not within a few seconds' walk from a car line already are served by the established routes.

Want Service Restored. — A resolution asking the Detroit United Railway, Detroit, Mich., to take over the defunct Detroit, Bay City & Western Railroad and operate it either as a steam or an electric line was passed at a meeting of farmers and citizens of Snover recently. The resolution states that 85,000 farmers are dependent upon the road for service.

Partial Bus Substitution Reported.—R. L. Lindsey, vice-president and general manager of the Durham Public Service Company, Durham, N. C., has told the city that plans are being made to co-ordinate railway and bus service. The present idea is to abandon a portion of the track in West Durham. The program, stated unofficially, includes the purchase of three buses.

Approves Coupon Ticket Book.—The Public Service Commission has approved a 40-commutation coupon ticket book of the Hudson Valley Railway at $6.40, good for transportation in either direction between Round Lake and Mechanicsville, N. Y. The book is limited to 30 days.

Will Supply Bus Service.—The Key System Transit Company has applied to the California Railroad Commission for a certificate to operate bus service between Santa Clara Avenue and High Street in the city of Alameda and East Fourteenth and High Streets in the city of Oakland, substituting such service over the proposed route for the present service. It is stated that operation over the present route is being maintained at a loss of $7,000 a year under present patronage, and the present route is not warranted. The present bus service was established upon authority of the commission in a proceeding involving an application by the Peerless Stages, Inc., to operate stages between Oakland and Alameda, the Key System Transit Company intervening and agreeing to supplement alleged insufficient car service by bus service.

Bus Service as Experiment.—The Key West Electric Company, Key West, Fla., is preparing to start a new bus service. According to the present plans the buses will be put in operation as an experiment for a period of three months.

Extensions of Service Sought. — Representatives of organizations in the outlying districts of Sacramento, Cal., and representatives of the Pacific Gas & Electric Company met at a special session of the City Council to discuss the possibility of obtaining either railway service or a bus line in those sections not now served with transportation. P. M. Downing, in charge of operation of the Pacific Gas & Electric Company, said that his company was ready and willing to do anything possible to give a better service, but that the receipts of the company during the past 2 years had shown a definite loss. He said further that no new car lines or buses could be installed unless the company in some way could show a profit.

Wants Payment Deferred.—Trustees of the Boston Elevated Railway, Boston, Mass., have asked the Legislature to correct the legislation of last year under which the subway extension to Ashmont is being built. That law provides that the Elevated must pay rental on the property as soon as the work of construction begins, so that the Boston Transit Commission is already prepared to send a bill to the Elevated. Col. Thomas F. Sullivan, chairman of the Boston Transit Commission, agrees with the Elevated trustees that the Elevated should not pay rental until the new line is completed and put into operation. He agrees with the counsel for the Elevated that the interest on the cost of extending the line should be reckoned as a part of the cost of construction. But the Elevated is willing to use parts of the extension before the whole is completed.

Buses Ready in April.—Samuel Cox, superintendent of the Quincy Railway, Quincy, Ill., has been notified that buses for the South Eighth and State Streets lines will be ready for service April 1. They will replace the street cars. The company is making further surveys with the idea in mind of substituting buses on other outlying branches of the system.

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Financial and Corporate

Foreclosure Proceedings Requested for Boston & Worcester

Upon the recommendation of the reorganization committee of the Boston & Worcester Street Railway, the American Trust Company, as trustee under the bond mortgages of the company, filed, Jan. 27, in the Supreme Judicial Court at Cambridge, bills for the foreclosure of the mortgages and a petition requesting the court to appoint a receiver. The liabilities of the railway consist mainly of bonds which matured Aug. 1, 1923, and unpaid interest thereon. The company has outstanding in the hands of the public a total of $2,297,000 bonds, of which $1,841,000 has been deposited under the reorganization plan of July 16, 1924.

The new reorganization plan, dated July 16, 1924, provided $296,940 for improvements. This plan was explained in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, 1924.

The reorganization committee requested foreclosure proceedings at this time as it felt it was to the advantage of the bondholders and in furtherance of the reorganization of the property.

The reorganization committee issued a letter to bondholders on Jan. 27 stating that foreclosure proceedings would be simplified and the reorganization of the company completed more promptly if holders of undeposited bonds will immediately deposit their bonds with the American Trust Company.

The Boston & Worcester Street Railway operates an interurban line between Boston and Worcester and branch lines in the towns of Natick, Framingham, Southborough and Hudson and in the city of Marlborough. The total trackage operated is about 113 miles.

Report of Impending Deal at Portland Confirmed

Holders of common stock of the Cumberland County Power & Light Company, Portland, Me., have been offered an opportunity to dispose of their stock for a sum that, plus accrued dividends to the date of settlement, amounts to $137.26 per share. The offer comes by letter to all holders of common stock through E. W. Clark & Company, Philadelphia, and J. & W. Seligman & Company, New York.

The letter states that these two concerns have been offered an opportunity to dispose of their stock for $137.50 per share plus accrued dividends to the date of settlement with the purchasers, the Albert Emanuel Company, New York City.

They offer to other holders of common stock an opportunity to dispose of their stock at the same figure minus $1 per share, which constitutes the charge to cover legal fees and other expenses, and the services of the two bond houses in disposing of the stocks.

The terms of the offer include a request that holders of common stock who are disposed to sell it at this price deposit the stock with the Seaboard National Bank, Mercantile Branch, New York City, on or before Feb. 10. The date agreed upon for the purchaser to make settlement is Feb. 16.

Danbury-Bethel Lines Purchased

Edward M. Bradley of the firm of H. C. Warren & Company, investment brokers, of New Haven, as chairman of the bondholders' protective committee, has purchased for $75,000, plus the outstanding debt against the company, the property of the Danbury-Bethel Street Railway, Danbury, Conn. The sale was under an order from the Superior Court and was conducted in Danbury on Jan. 15 by James E. Wheeler of this city.

Under the terms of the sale, the purchaser is to assume the receiver's obligations, which amount to $251,000, of which $128,328 is disputed. Receiver Judge J. Moss Ives of Danbury will remain in charge of affairs of the road until the court passes upon the claims.

The road recently was appraised at $529,981. The bondholders, who were the plaintiffs in the foreclosure proceedings, claim that there is due on the mortgage $279,166. The taking over of the property by the bondholders was referred to previously in these pages.

A Bargain at $162,834,584

Chicago Engineers Hold This Price Reasonable as Amount to Be Paid by City for Surface Lines—Interesting Comment by Engineers on Individual Items Included in Appraisal

THREE utility engineers, waiving agreement on a specific value, have decided that the Chicago Surface Lines would be a bargain at $162,834,584. The engineers, two representing extremes in seeking a valuation figure and the third brought in by their choice as a referee, made the appraisal at the instance of the Chicago City Council committee on local transportation and a committee of bankers holding surface lines securities.

The figure of $162,834,584 used is the value fixed in the 1907 ordinances, soon to expire, which shall be the maximum price paid by the city in event of purchase. Mayor Dever and the traction owners said they would adhere to the ordinance, but a dispute arose over ownership of the company's $19,000,000 replacement fund. The owners said that if the city took it this would in effect cut the price to $19,000,000 under the ordinance figure. The engineers upheld the Mayor's contention that the money should go with the lines.

William Barclay Parsons, New York; William J. Hagenah for the traction company and R. F. Kelker, Jr., for the city, made the appraisal. Each had his own figures. They varied widely. On reproduction value, less depreciation, the figures follow:

Kelker	$176,500,000
Hagenah	204,308,669
Parsons	196,500,000*

*Kelker's estimate, plus $20,000,000 going concern value, explained below in finding No. 2.

On "original cost" two of the figures were the same but were arrived at in different manners. They are:

Kelker	$141,773,000
Hagenah	167,180,727
Parsons	167,180,727

The appraisers find that the property consists of 1,062 miles of single track, 3,540 passenger cars, of which 36 are under construction; 256 single-truck T.V.C. passenger cars held in reserve, 555 service cars, 21 carhouses, 20 substations, two storage battery stations, two main car repair shops, several hundred miscellaneous buildings and 147 parcels of real estate. All property is declared to be in fine condition.

Eight factors were given the engineers and their findings under each may be briefly summarized as follows:

1. Original cost of plant and permanent additions and improvements so far as the same is ascertainable from existing valuations, inventories and such other data available.

Major Kelker takes "original cost" to mean the cost of the existing properties to the present owners and from the facts available places this at $141,773,000.

Mr. Hagenah takes as a base the 1907 compromise figure of $55,775,000, to which he adds property additions made according to ordinances and property acquired and temporarily financed through the special renewal and equipment fund. Total $167,180,727.

Mr. Parsons uses the Hagenah figure, but bases it upon "historical cost" plus Hagenah's other figures. In the absence of definite evidence he accepts the 1907 compromise figure tentatively as the "historical cost."

2. Reproduction cost less depreciation; i.e., what it would cost the city to reproduce these properties less depreciation, taking into account the cash and property in the renewal and depreciation funds.

Major Kelker holds that the construction work best would be accomplished by the companies rather than by contractors, and, deducting depreciation, arrives at $176,500,000.

Mr. Hagenah visualizes a reproduction "using the construction methods and equipment ordinarily employed in such work, the undertaking being carried on under a continuous construction program and with sufficient funds available, but assembling a special construction organization. Value, $245,621,621 for a new plant; deducting depreciation, $204,308,669, exclusive of going concern value and cash working capital."

Mr. Parsons sustains Major Kelker's method, but holds it falls short in not assuming that the experience and organization of such a going concern are

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to be used and therefore are entitled to a representation in the value. He adds to Major Kelker's figure the going concern value as determined in finding No. 5.

3. The amount and market value of stocks and bonds. Discusses average values from 1907 to date.

4. Present and probable future earning capacity. Estimated earnings for year ending Jan. 31, 1925, deducting city's 55 per cent, taxes and renewal fund contributions, $9,463,962. On the assumed purchase price at 5 per cent the city would have fixed interest charges of $8,142,179. For the past four years the company's share of net returns has averaged $1,635,383 in excess of the sum set as the city's fixed interest. The undivided net earnings, however, have averaged $14,752,713, or nearly twice these fixed charges. A moderate yearly increase is indicated, the number of revenue passengers in the years 1925-1945 increasing from 824,000,000 to 1,354,000,000.

The engineers say that assuming the properties shall be operated efficiently, the present and prospective net earnings warrant the city in making the purchase at the ordinance purchase price.

5. Going concern value. Awards ranging up to 20 per cent of the "bare bones" value were cited along with court decisions, but no percentage agreement was arrived at and the engineers compromised on the figure adopted in 1920 by the Illinois Commerce Commission for rate-making purposes, $20,000,000.

PHYSICAL CONDITION OF PROPERTIES EXCELLENT

6. Present physical condition. We find the present physical condition of these properties excellent. Viewed from the practical point of operating condition, the equipment, tracks and buildings are being well maintained. In setting up the item of deductions in the estimate for reproduction costs, the appraisers have had in mind fixing a figure which had direct relation to the purchase price of the property and not to its momentary physical condition from the operating standpoint.

The amount set aside for renewal and depreciation reserves have been so much in excess of renewal expenditures to date that an accumulation of approximately $19,000,000 against accruing wear to track, equipment, etc., is provided for.

7. Fair cash market value of real estate. Special appraisers find fair cash value of land without buildings or improvements $8,937,277. Additional real estate not used for railroad operation $76,604.95.

8. Allowances for value of unexpired franchises. None.

9. The appraisers find the present fair value of these properties for the purpose of purchase by the city, taking into consideration all the above-mentioned eight factors, to be in excess of $162,834,584, the price fixed by the ordinance, this sum to be adjudged to care for subsequent additions or deductions made between Oct. 31, 1924, and the date of the transfer.

The sections in which the engineers settled the disposition of the disputed $19,000,000 in the city's favor were taken up separately from the factors. The vital paragraphs referring to the fund follow:

> Under the provisions of the settlement ordinances the operating company is required to set aside 8 per cent of its gross receipts as a renewal fund to insure the proper upkeep of the properties. The residue receipts, after paying all operating expenses and taxes, are applied first to pay 5 per cent on the purchase price, and the remainder is divided between the city and the company in the ratio of 55 per cent and 45 per cent, respectively.
>
> The contributions to the renewal fund have been in excess of the current requirement thus far found necessary, so that on Oct. 31, 1924, this fund consisted of $14,716,506 in cash and $4,337,142 in new equipment and track purchased out of the fund but not added to the purchase price. A sale of the properties to the city under the existing ordinances would carry with it this renewal fund and its further accumulations to the date of the actual transfer as well as the equipment purchased out of this fund.
>
> The amount of the purchase price will be subject to constant increase as additions are made to the properties from time to time and in like manner the renewal fund will be increased or diminished as contributions are added from gross receipts or payments made for renewals. Both figures are, therefore, subject to correction to be fixed at the date of the transfer of the properties, should such transfer be effected. These additions or withdrawals in the near future are not likely to be of such moment as to modify to any extent the conclusions in this report.
>
> The ordinances fix the price at which the city can buy and at which the company shall sell at the option of the city. The ordinances provide that this sum shall be payable in cash, although, of course, it may be paid in other form if both parties agree.

New York Railways Reorganization a Step Nearer

Approval of the plan of reorganization of the New York Railways, New York City, has been obtained from the three protective committees representing holders of Broadway & Seventh Avenue Railroad first consolidated 5 per cent mortgage gold bonds; Broadway Surface Railroad 5 per cent first mortgage bonds, and South Ferry Railroad 5 per cent first mortgage bonds. Notices to this effect were published on Jan. 27 by the reorganization committee.

The way now seems clear to declare the reorganization plan effective. The plan has been approved by the court and the Transit Commission.

Dividend to Be Paid

Chicago City & Connecting Railways, the collateral trust holding shares representing about 40 per cent of the value of the Chicago Surface Lines, will pay $1 dividend Feb. 25 to stockholders of record Feb. 16 on 250,000 preferred participation shares. The dividend, the first since 1918, comes from accumulation for several years of income over bond interest requirements. In his annual report, Bernard E. Sunny, chairman of the board, tells of the dawn of a better transportation era for Chicago. "Any change to be made," he says, "is all to the good. Negotiations with the city have brought out much information about the properties that has been enlightening and has increased the interest and confidence in them." He said that the statement made in the last annual report that Chicago had the best railway property in the world had recently been repeated by high officials of the city, which had helped to repair the injury to the reputation of the properties caused by derogatory reports previously circulated. Income received by the trust amounts to $1,219,525 compared with $1,252,260 in 1923. Bond interest of $1,041,300 and bond redemption of $105,000 were the largest items against receipts. The balance sheet shows the trust holds $597,000, or double the sum necessary for the dividend.

Toledo Made Good Showing in December

For the first time in many months the Community Traction Company, Toledo, Ohio, had a surplus in December, 1924. After all charges this surplus was $24,630. The expenses were $224,728, including $15,000 for extraordinary maintenance, as against expenses of $240,297 for the similar month the year previous. The gross revenue for December was $340,761, compared with $344,654 for December, 1923. Bus operations on the feeder lines showed improvement with increased riding.

Sinking fund requirements for 1924 were $226,543. The showing here sustains the recent observations of board members that the company would now be breaking even and providing a profit were it not for the city-purchase plan written into the Milner ordinance. The sinking fund has already provided for the retirement of $722,000 of bonds of the company and there is added $183,483 cash in the fund. This is approximately 10 per cent of the capital value of the company. When this fund reaches 20 per cent the present set-up for the sinking fund may be done away with and in extensions of the franchise the fund may be allowed to pay its way, retiring every year 1 per cent of the amount of capital value that is outstanding.

Acting Commissioner E. L. Graumlich indicated that January would show about an even break. He announced also that the maintenance program for 1925 was set at $680,000, compared with $770,000 for 1924 and $640,000 the previous year. In 1924 the company began with about $50,000 deficit in the maintenance fund. The present year is starting with about a similar amount of cash on hand in the maintenance fund.

Committee Will Appraise Rainier Property

Negotiations for the purchase by the city of Seattle, Wash., of the Seattle & Rainier Valley Railway will probably be undertaken in the near future, following steps taken by the City Council for an appraisal of the company's property. John C. Higgins, counsel for the Rainier Valley line, declares that his company is ready to sell to the city, providing satisfactory terms can be arranged. The bonded indebtedness of the system, he reported, is between $1,500,000 and $1,600,000, the debt secured by first and second mortgages aggregating about $1,000,000 and third mortgages of $550,000. In addition, there is outstanding approximately $350,000 of the company's stock to participate in any liquidation.

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Cleveland Interest Fund Up

Economy and Efficiency in Operation There Reflected in Report for Year —Need for New Financing

Ways and means of financing extensions and betterments by the Cleveland Railway, Cleveland, Ohio, will have to be found during the present year. John J. Stanley, president, so reported in his message to stockholders of the company presented at the annual meeting on Jan. 28. Mr. Stanley pointed out that not in four years has the company really added to its capital account through the sale of stock, and that minor betterments made during the past four years have come from funds derived from retirement of other property. He said:

Our franchise provides that we may not pay more than 6 per cent for money. During the past few years money has been worth more than 6 per cent. It is now worth more than 6 per cent. This means that our property will not be enlarged until we are authorized to pay a higher rate of interest or until the general market price of money drops to or below 6 per cent. Cleveland needs extensions and betterments of its street railway system. The growth of the city in population and area means that this growth ought to be met by service adequate to take care of it and greater service calls for more tracks, rolling stock, buildings and power.

The grant under which the Cleveland Railway operates provides that no stock can be sold at less than par, and at no time during 1924 was the stock of the company at this figure. Its high was 96 and its low 85.

Mr. Stanley pointed out that since the year 1910, when the Tayler service-at-cost grant went into effect, Cleveland car riders have been saved $53,702,632, representing the difference between the average rate of fare paid in Cleveland during that time, which was 4.315 cents, and that paid in ten other large cities in the country, which was 5.814 cents. This, he said, meant an average yearly saving to car riders of $3,835,902. The average income received per ride last year amounted to 4.47 cents.

The total revenue of the Cleveland Railway in 1924 was $17,313,548, an increase of 5.94 per cent, while the actual expenses for the year were $16,905,151, divided this way:

For maintenance, renewal and depreciation, $4,463,252; for operation and general expenses, $9,139,686; taxes $1,279,741; interest on bonds and dividends on stock $2,022,471.

As usual, wages paid conductors, motormen and trainmen took the largest slice of the operating expenses, namely, $4,543,791.

For injuries and damages, the company in 1924 spent $1,170,799, a decrease over the previous year of $411,796.

Taxes of the company, however, increased $197,546.

The number of car riders in 1924 decreased 6.46 per cent, or from 417,405,905 riders in 1923 to 390,424,469 in 1924.

The company operated 38,084,832 passenger car miles in 1924, a decrease of 4.66 per cent.

The amount paid by the company to tax-spending authorities and the cost of injuries and damages combined totaled $2,450,540. This was $428,068 more than was received by the people as interest on their investment in the bonds and stock of the company.

During 1924 the company operated at its maximum rate of fare, 6 cents cash, 9 tickets for 50 cents and 1 cent for transfer. It added 16 trailers and 25 new motor cars to replace equipment retired, and also relaid 11 miles of track.

At the end of 1923 there was a deficit of $544,221 in the interest fund, which is the fare barometer. As a result of the economy and efficiency in operation in 1924 the interest fund at the end of 1924 contained a balance of $532,254, this despite the fact that fewer riders were carried in 1924 than in 1923. When this fund reaches $700,000 the rate of fare must automatically drop one notch and when the fund goes below $300,000 the fare is increased.

The number of stockholders in the company is 6,222, of whom 5,532 live in Ohio and 4,135 in Cuyahoga County.

New Interests in Columbus Company Elect Representatives

The management destinies of the Columbus Railway, Power & Light Company, Columbus, Ohio, are now in the hands of Clarence C. Slater. He started Jan. 27, the day of the annual meeting of the company, as general manager. He finished as vice-president and general manager.

Charles L. Kurtz, president, and D. Meade Massie have resigned. Cyrus S. Eaton, Cleveland, who owns the controlling interest in the Continental Gas & Electric Company, and Frank Hulswitt, Chicago, president of the United Power & Light Company, representing interests which recently obtained control of the Columbus organization, wanted Mr. Kurtz to stay as president, but he withdrew of his own accord as president because he believed that he was entitled to a much-needed rest. He has served with distinction as president of the company since the change in control in 1919 that resulted in the election of Ohio men as executives of the company.

The directors adjourned without naming a successor to Mr. Kurtz. They are expected to meet within the next three weeks to announce their choice. Mr. Eaton was named second vice-president to succeed William A. Gill, resigned. No one was selected to fill the post of treasurer, recently vacated by Norman McD. Crawford.

P. V. Burington, secretary and auditor of the company for nearly 30 years, was retired with a pension. He was succeeded by Lyle F. Babbitt. Allen C. Beck was named assistant treasurer.

The new board of directors is composed of Messrs. Eaton, Hulswitt and Slater, Thomas Hoyt Jones, Edward W. Borer, and W. C. Williard, Walter B. Beebe, Frank L. Stein, J. B. Hanna, Ben W. Marr and Harry C. Holton.

Cincinnati stockholders, who opposed the refinancing plan, obtained amendments which conceded a 6½ per cent dividend to Series B preferred instead of 6 per cent.

The amendments were not passed upon at the stockholders' meeting. Instead action was deferred until Feb. 10, when another session will be held to take final action. In view of the fact that the forces opposing the original plan, led by H. C. Eustis, Cincinnati broker, announced their satisfaction with the concessions made, it is believed that the plan will be carried without serious opposition.

In obtaining approval of the amended refinancing plan, the Eaton-Hulswitt forces agreed to put another $1,500,000 into the company in the form of common stock purchase to strengthen the new first preferred. Mr. Eaton and his associates had agreed previously to purchase $1,000,000 of common stock.

Rochester Railway and Bus Lines Fall Short in October Quarter

The combined returns of the New York State Railways, Rochester lines, and the Rochester Railways Co-ordinated Bus Lines failed by $53,696 for the quarter ended Oct. 31, 1924, to meet the guaranteed return under the service-at-cost contract with the city, according to the report of Charles R. Barnes, Street Railway Commissioner. The railway lines fell short by $50,183 and the bus lines by $3,513.

Total revenues from railway operations were $1,184,425, or 48.86 cents for each mile of the 2,424,257 car-miles run. Operating expenses were $861,082, leaving a net revenue for railway operations of $323,342.

The street cars for the period carried 23,023,412 passengers, of whom 30.67 per cent were transfer riders. The cross-town trackless trolleys carried 333,404 riders, of whom 83.1 per cent were transfer passengers. The Dewey Avenue feeder bus line transported 58,050 passengers, of whom 82 per cent were transfer riders.

Debentures Offered. — The National City Company, New York, is offering at 93¾ and interest to yield 7.70 per cent $10,000,000 of 20-year sinking fund 7 per cent debentures of the General Electric Company, Germany. Proceeds of the debenture issue will be used to reduce current liabilities, to increase working capital and also, to some extent, to install additional machinery.

Delinquent Property to Be Sold. — The City Treasurer of Portland, Ore., has given the final notice of sale of delinquent property in Portland, which includes the King Heights Electric line, which will be sold for delinquent assessments and taxes in the sum of $11,669. The city officials may have to buy the line to protect the residents of the district served.

New Twin City Transit Directors. — At the annual meeting of stockholders of the Twin City Rapid Transit Company, Minneapolis, Minn., the following directors were elected for a term of three years: Horace Lowry, president of the Twin City Rapid Transit Company; E. W. Decker, president of the Northwestern National Bank, Minneapolis, and Frank Bergen, attorney, of Newark. A. E. Ames of A. E. Ames & Company, Toronto, was elected to fill a vacancy on the board for one year, as was Ralph Budd, president of the Great Northern Railway.

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Wants Change in Stock.—The Bristol & Plainville Electric Company, Bristol, Conn., has certified to the Secretary of State an amendment to its charter which will permit a change in the par value of the company's stock by the vote of the board of directors.

Bonds Called.—Notice has been given that a portion of the American Electric Power Company's 5 per cent refunding convertible gold bonds dated Aug. 1, 1911, has been called for redemption. The company, formerly known as the American Railways, Philadelphia, Pa., will pay on Feb. 1, 1925, the face amount of such bonds drawn for redemption, with interest thereon to Feb. 1 next and a premium equal to 2 per cent of the principal thereof. Holders of the various bonds called for redemption are notified to present and surrender them with coupon due on Feb. 1, 1925, and all subsequent coupons attached.

Debentures Offered. — Pearsons-Taft Company, Chicago, is offering at 99¼ and accrued interest, to yield more than 7 per cent, $2,500,000 of series D 7 per cent convertible gold debentures of the Cities Service Company, New York, N. Y. The debentures, dated Dec. 1, 1919, and due Jan. 1, 1966, will be callable as a whole or in part at 102 and interest. The Cities Service Company owns directly or indirectly a majority of the common stock of more than 60 public utilities, comprising a large and successful system of electric light and power, street railway and more than 40 subsidiaries representing an important system of oil production, distribution, refining and marketing.

Value of Fresno Property Revised.—The California Railroad Commission, in a supplemental opinion and order, has fixed the value of property of the Fresno Traction Company as follows: Property within the city of Fresno, $1,237,073; property outside of the city of Fresno, $313,247; total property of Fresno Traction Company, $1,550,320. This valuation is fixed as of June 30, 1922, to include investments added since the previous valuation was made by the commission. The value so fixed is the amount on which earnings are to be calculated in order to carry out the intent of Section 12 of the resettlement franchise which the railway was authorized to exercise by the commission on May 3, 1922.

Cities Service to Redeem Scrip.—A plan for the redemption of its scrip dividend payments, which were non-interest bearing and amounted simply to a promise at some future date to pay, has been worked out by the Cities Service Company. In accordance with the plan the company will pay out the equivalent of more than $34,000,000. Of this, $10,000,000 will be in cash and the rest in the form of stock which will pay a dividend. Culmination of the plan followed the issuance of non-interest bearing scrip since July 1, 1921, and the date set for the conversion of these paper promises into the actual cash or interest bearing securities was March 1 next. The development of the public utility business of the company was said to have warranted the expenditure.

Preferred Stocks Offered.—Stone & Webster, New York, are offering at 103, to yield 6.80 per cent, $1,500,000 of 7 per cent cumulative preferred stock of the El Paso Electric Company, El Paso, Tex. The stock, known as series A, has a par value of $100. It is redeemable at $115. The proceeds from the sale of this preferred stock will be used to retire floating debt and for other corporate purposes.

Removal of Tracks Allowed. — The Pacific Electric Railway, Los Angeles, has been authorized by the California Railroad Commission to abandon and remove its tracks on the West Colorado Street and Orange Grove Avenue line, the Los Robles Avenue and Washington Street line and the California Street line in the city of Pasadena. Bus service has been substituted for the railway service.

Tramway to Abandon Line.—The Colorado Springs & Interurban Railway, Colorado Springs, Col., on Jan 3 was authorized by the State Public Utilities Commission to abandon its line known as the Roswell loop. Roswell is a suburb of the Springs. The railway is permitted to remove its tracks and pole line.

Authorized to Abandon Appurtenances.—The Nevada County Traction Company has been authorized by the California Railroad Commission to abandon and remove its railroad, tracks and appurtenances in the city of Grass Valley, Nevada County. It was shown at the hearing of the application that operations were carried on during 1923 at a net corporate loss of $5,377. Regular operation was suspended on Dec. 7, 1923, by reason of snow conditions, and has never been resumed due to inability of the company to obtain funds to finance operations.

Suit Over Railway Control Dismissed.—The bill in equity filed by Mary Walker Boggs, wife of the late R. H. Boggs, department store owner and traction magnate, in an effort to obtain the return of control of the Pittsburgh, Butler, Harmony & New Castle Railway, New Brighton, Pa., from David I. McCahill and his associates has been dismissed in an opinion handed down by Judge James R. Macfarlane. It was alleged by Mrs. Boggs that control of the railway was procured from her late husband without his receiving any compensation in return. The bill in equity sought an accounting and suggested the court order the stock of the company, which was apportioned to McCahill and his associates, returned to the Boggs estate. The court held, in short, that no duty devolved upon it to revise a disposition or "exchange of property made by an unusually capable business man" who took no steps toward that end in his own lifetime.

Sale of Niagara Gorge Road Approved.—The New York Public Service Commission has approved the sale of the entire outstanding capital stock of the Niagara Gorge Railroad to the Niagara Falls Power Company. E. E. Nicklis, who has been superintendent of the railway, will continue in this capacity. Other officers elected at the organization meeting are: A. H. Schoellkopf, president; Bert L. Jones, vice-president and general manager; Mrs. Joseph T. Jones and Ross R. Coddington, second and third vice-presidents, respectively; G. L. Corliss, secretary and assistant treasurer, and W. Paxton Little, treasurer. A. H. Schoellkopf, J. F. Schoellkopf, Jr., R. J. Hutton, Morris Cohn, Jr., and Ross R. Coddington were added to the directorate.

Book Reviews

Stinnes and His Enterprises (Stinnes und Seine Konzerne)

By Paul Ufermann and Carl Hüglin; Berlin, Verlag für Sozialwissenschaft. 206 pages.

Through the Siemens-Halske and Schuckert companies, which he controlled, Stinnes was for many years a very active figure in electrical development in Europe, Asia and South America. His promotion work was aggressive, and the combination of steel, chemical, banking, shipping and electrical manufacturing interests under his direction gave him great power. This book describes the corporate relations of his various companies, some of which were electric railway, and it contains nearly 100 corporation charts.

The Journal of Land and Public Utility Economics

Vol. I, No. 1. Quarterly. Published by A. W. Shaw Company, Chicago.

The Institute for Research in Land Economics and Public Utilities, of which Richard T. Ely, of Madison, Wis., is director, has assumed editorial responsibility for the new quarterly mentioned above. Dr. Ely is its editor in chief. The first number contains several articles of special interest to electric railway operators. Ralph Heilman, dean of Northwestern University School of Commerce, contributes an article on "Customer Ownership of Public Utilities," in which he speaks of its advantages and also of its dangers. Herbert E. Simpson, a research associate of the Institute, contributes an extended discussion on taxation of public service industry, with many statistics and charts, in which some interesting facts are given on electric railway taxation. Other articles of interest to electric railways concern the prevention of waste by city planning and the water power situation and the United States.

The Automobile: Its Province and Problems

The *Annals* of the American Academy of Political and Social Science for November, 1924, is devoted entirely to the automobile, its province and its problems. Altogether there are 50 contributed articles. The topics included: The services of the automobile; the manufacture and sale of automobiles, the home, the school and the church; the place of the motor in our transportation system; the building and financing of motor highways; the safety of the highways through traffic regulation. The contributors include men prominent in automobile manufacture, highway engineers, and others familiar with the topics on which they treat.

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Personal Items

Harry Brown Joins Ohio Brass Company

Executive Editor of the "Journal" Resigns to Accept Executive Position with Manufacturer—Mr. Buck to Be Acting Head of Staff

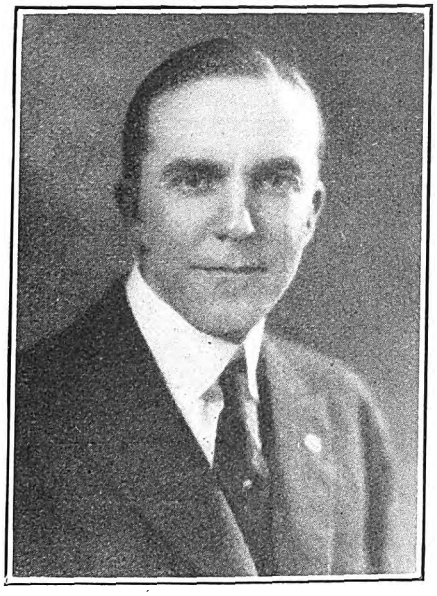
Harry L. Brown, editor ELECTRIC RAILWAY JOURNAL, has resigned, effective February 1, to become an executive of the Ohio Brass Company, Mansfield, Ohio. Mr. Brown has been connected with the McGraw-Hill Company for the past 10 years. He started with the company as an assistant editor of *Electrical World* early in 1915. The following year he transferred to the position of Western editorial representative of the ELECTRIC RAILWAY JOURNAL in Chicago and subsequently was promoted to Western editor. In April, 1922, he moved to New York to become managing editor of the JOURNAL and then on January 1, 1923, was made co-editor with Henry W. Blake and placed in executive charge.

The earlier experience of Mr. Brown began with the degree of bachelor of electrical engineering from the University of Michigan. For two years before taking up editorial duties he was engaged in engineering work with the Aurora, Elgin & Chicago Railroad and the Chicago Telephone Company. During the war he was first lieutenant and captain in the Signal Corps. In this work he had a great deal to do with radio and after the war was co-author of Lauer and Brown's "Radio Engineering Principles," a successful college text book.

Mr. Brown's editorial work and broad contact in the power and electric railway fields have given him a very wide acquaintance and an intimate knowledge of the problems and progress of these industries. His studies of electric railway and bus transportation were extended to foreign countries during the summer of 1924 in the trip made to Europe by a committee of the American Electric Railway Association, of which he was a member. The report of this committee was presented at the annual convention of the American Association last October and published in the ELECTRIC RAILWAY JOURNAL for Sept. 20, 1924. It seems to have made a profound impression both in this country and abroad, as the committee continues to receive congratulatory letters on the value and usefulness of the matter presented.

As executive editor of the JOURNAL, much of Mr. Brown's work has been concerned with making the paper's policies more aggressive and its articles more practical. The staff has been strengthened by adding several new men drawn from active railway work. It is generally conceded that the paper is more valuable to the industry today than ever before. Its leadership is unquestioned. Its campaigns for the newer developments have been of far reaching effect in helping to restore the industry to a sound condition.

For several years past Mr. Brown has consistently emphasized in the paper an optimistic view of the outlook for the industry, because of his firm belief in its fundamental soundness. He has been an ardent advocate of measures to improve public relations and to merchandise the service, particularly those having to do with modernization of the railway plant and operating methods. He was one of those who first urged adoption of the bus by railway companies where suitable as an adjunct to their service,



H. L. Brown

for he sensed the value of the bus as a new transportation tool.

The success which has attended Mr. Brown's efforts is perhaps best attested by the enhanced position of the JOURNAL among the leading men of the industry. His associates deeply regret his retirement from the paper. But a strong editorial staff has been built up which will carry on aggressively the policies established under Mr. Brown's direction. To this end, Morris Buck, managing editor, is made acting head of the staff.

Charles Currie Heads South Bend Road

Another honor has been bestowed upon Charles Currie, who has been actively identified with the electric railway industry for more than 30 years. He has just been elected to the presidency of the Chicago, Lake Shore & South Bend Railroad, which he has served as acting vice-president.

In addition to holding this position, Mr. Currie also is president of the London Street Railway, London, Canada, and a director of the Northern Ohio Traction & Light Company, the Lake Shore Electric Railway and the Cleveland, Painesville & Eastern Railway. He was vice-president and general manager of the Northern Ohio Traction & Light Company up to 1916.

Mr. Currie has made Michigan City his headquarters for the past year, having assumed the duties of the late C. N. Wilcoxon, who headed the Chicago, Lake Shore & South Bend Railway. Mr. Currie is about 55 years of age.

N. McD. Crawford Retires

Executive of Columbus, Ohio, Property Withdraws from Utility Field After Forty Years of Service

Norman McD. Crawford has resigned as vice-president and treasurer of the Columbus Railway, Power & Light Company, Columbus, Ohio. Mr. Crawford is leaving the organization because of a wish to retire from active business. He has no plans for the future other than taking a much-needed rest. He has been at work more than 40 years and believes that the time has come for him to retire from active participation in the management of public utilities. Mr. Crawford's resignation is to become effective at the convenience of the board of directors of the company, but not later than March 1.

Mr. Crawford has been connected with the company at Columbus since 1916. He went to Columbus early that year as the representative of the E. W. Clark & Company Management Corporation. The following March he was elected vice-president of the company to assist S. G. McMeen of the Management Corporation, then president of the Columbus Railway, Power & Light Company. At the time of the change in control of the property at Columbus several years ago the wide experience of Mr. Crawford was quickly appreciated by the new interests in the company, and he continued with it undisturbed as to the scope of his activities.

Mr. Crawford is particularly well known in the East. As he himself has said, he has been in business more than 40 years. As a matter of fact, as a contractor, he built the Glastonbury line of the Hartford Street Railway, Hartford, Conn., as long ago as 1892, and was afterward retained by the company as engineer. In 1894 he was made general manager of the company, which position he held until the Hartford Street Railway was taken over by the Connecticut Company. In December, 1908, Mr. Crawford was elected president of the Mahoning & Shenango Railway & Light Company. Later he became connected with the Reading Transit & Light Company, Reading, Pa., which property he served as president and general manager. He was also for several years vice-president of the Ohio Electric Railway, Cincinnati.

The scope of Mr. Crawford's activities is well illustrated by the posts he filled at Youngstown and at Reading. The Mahoning & Shenango Railway & Light Company owns and controls electric railways at Youngstown, Warren, Niles and other cities in Ohio and in Newcastle, Sharon, Wheatland and Sharpsville in Pennsylvania, and the lighting properties in Youngstown, Newcastle, Sharon and Sharpsville. In

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all, that company operates 145 miles of electric railway.

The Reading company controls the lines in and around Reading, Pa. In addition to being president and general manager of the Reading Transit Company, Mr. Crawford was also vice-president and general manager of the Neversink Mountain Railway and vice-president and general manager of the Oley Valley Railway, Reading, also vice-president and general manager of the Metropolitan Electric Company.

In 1906 Mr. Crawford spent 6 months in Europe investigating electric railway conditions there for the committee on public ownership and operation of the National Civic Federation. His conclusions, with those of his associates in the investigation, were embodied later in several volumes on the subject, published by the federation.

Personnel of Bus Division Announced

Under a new plan of organization of the West Chester Street Railway, West Chester, Pa., made necessary by the taking over of the West Chester Transportation Company, operating buses in Chester and Montgomery Counties in southeastern Pennsylvania, C. W. Christensen will be general superintendent of motor coach operation and also will head the personnel and public relations departments. Mr. Christensen was formerly with the Bell telephone system. Three divisions of the bus system will be established as follows:

Wilmington Division, Lewis Souder, division superintendent, to include the routes between Wilmington and Chester; Wilmington, Avondale, West Grove and Oxford; Wilmington and Kennett Square, via Hamorton; Wilmington and Kennett Square, via Hockessin.

West Chester Division, Henry Corcoran, division superintendent, routes between West Chester and Pottstown; West Chester and Norristown; West Chester and Wilmington; West Chester and Chester; Media and Kennett Square; Downingtown, Strafford and other Lincoln Highway points.

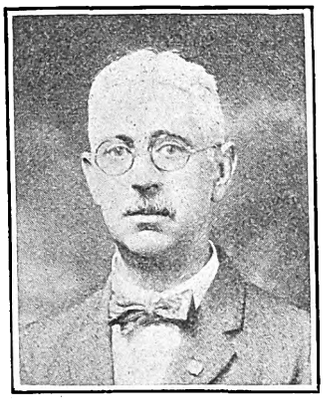
Phoenixville Division, Eli Stoltzfuss, division superinendent, routes between Phoenixville and West Chester; Phoenixville and Norristown; Phoenixville and Valley Forge; Phoenixville and Spring City, Royersford, Phoenixville and Collegeville.

P. J. Duffy Heads New Transportation Department in Chicago

P. J. Duffy was appointed, effective Jan. 1, superintendent of the central division of the Chicago Surface Lines transportation department. Mr. Duffy, one of the oldest employees in point of service of that organization, started work in 1876, during the horse car days, with the Chicago West Division Street Railway. In 1898 he was appointed assistant station superintendent. Two years later he became station superintendent. With the formation of the Chicago Surface Lines in 1914 he was appointed assistant division superintendent and continued in that position until 1923, when he was transferred to the headquarters of the transportation department with a special assignment in contact with the downtown traffic police. Out of this arrangement grew the plans for the formation of the new central division, through which it is hoped to get more effective co-operation with the police department in directing traffic through the loop district. Twelve supervisors have been assigned to Superintendent Duffy to help direct this work. Reference to the creation of this new department is made elsewhere in this issue.

W. B. Wheeler Advanced with Third Avenue Railway

William B. Wheeler has been appointed assistant superintendent of transportation of the Third Avenue Railway, New York, under William E. Thompson, vice-president and superintendent of transportation. Mr. Wheeler started as a conductor with the Atlantic Avenue Railroad, Brooklyn, in 1894. He left that company in 1897 to become connected with the Metropolitan Street Railway, operating the Broadway line in New York City. At that time the line was operated by cable. In 1898 Mr. Wheeler was transferred to the Lenox Avenue Railway, 146th Street and Lenox Avenue, then operating the first underground conduit system in New York City. Here he was made starter. The Lexington Avenue line was changed over from cable to underground conduit in 1901, and Mr. Wheeler was sent to that line as depot starter. On Dec. 2, 1903, he began to serve the Dry Dock, East Broadway & Battery Railway, the Central Crosstown Street Railway and the Metropolitan Street Railway, all operating out of the Avenue B depot. In July, 1908, Mr. Wheeler was made superintendent of the Westchester Electric Railroad, which operates in Mount Vernon, New Rochelle and other towns in Westchester County. He was general superintendent under the receiver in entire charge of the property. In December, 1919, he went to the Third Avenue Railway as superintendent of schedules. He has continued in that capacity since that time.



W. B. Wheeler

Alfred H. Schoellkopf, vice-president of the Niagara Falls Power Company, Niagara Falls, N. Y., has been elected president of the Niagara Gorge Railroad, taken over recently by the power company principally because of the strategic position of the railway with respect to future power development plans at the falls.

Archie Andrews, a veteran employee of the Rockford & Interurban Railway, Rockford, Ill., has been advanced to the position of general superintendent, to succeed J. A. Phelan, who resigned recently to become connected with the Chicago Motor Coach Company.

George A. Henshaw, recently appointed co-receiver of the Oklahoma Railway, Oklahoma City, Okla., was at one time a member of the Oklahoma constitutional convention, Assistant Attorney-General under Charles West from 1907 to 1911 and a member of the State Corporation Commission from 1911 to 1917. He has been a prominent practicing attorney in Oklahoma City since his retirement from the commission and has specialized in public utility cases before the commission and courts. He has, however, never represented the Oklahoma Railway in any capacity.

Clark G. Anderson, general manager and assistant to the president of the Arkansas Valley Interurban Railway, Wichita, Kan., resigned on Jan. 1 to accept a position of cashier with the Fifth Avenue Trust & Savings Bank, Moline. Mr. Anderson was head of the Wichita property only since last July, when he resigned as manager of the Clinton, Davenport & Muscatine Railway, Moline, Ill. He started upon a public career in Moline as city engineer. In this capacity he served 6 years. His ability gained for him a place on the first city commission when the form of government was changed. He began service with the interurban railway at Moline in 1914.

Robert Ridgway, chief engineer of the New York City Board of Transportation, has been elected president of the American Society of Civil Engineers. Mr. Ridgway has been identified with rapid transit construction in New York City 25 years. Just now he is engaged in the task of designing and planning New York City's new subway system intended for municipal operation. Mr. Ridgway joined the Public Service Commission in 1912 in charge of the supervision of subways and elevated lines, including five tunnels under the East and Harlem Rivers, embracing 620 miles of single track at a construction cost of more than $200,000,000.

Obituary

W. A. House

William Alexander House, formerly president of the United Railways & Electric Company, Baltimore, Md., died in that city on Jan. 27, aged 64 years. He had been ill only a few days. The malady to which he succumbed was diagnosed as pneumonia.

Mr. House retired from the United Railways & Electric Company in 1917. He saw many years of active service

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with the railways in that city and was an inexhaustible source of information with respect to all of their operations. He was chivalry itself and all his letters, no matter how prosaic their subject, reflected this attitude of the man. His bold flowing hand and the personal touch that he gave to his letters marked him as a man of unusual characteristics.

In fact, it often seemed that all the letters that went out from the company during the time he was president were signed by him. For the last seven years Mr. House had not been actively engaged in business. He had earned for himself the right to take things easy after 37 years of active service with the local lines in his native city, and this he did.

It was in 1879 that he entered the employ of the old People's Passenger Railway as an assistant in the accounting department. He served in this and other departments until 1883, when the People's company was reorganized with T. E. Hambleton as president. At that time Mr. House was made secretary and general superintendent of the new company. In 1889 the People's Railway was succeeded by the Baltimore Traction Company, and soon thereafter Mr. House was made general manager of the combined properties. In this capacity in the year 1892 the work was carried on by him of electrifying the lines in Baltimore. In recognition of his faithful service there came in 1895 his election to the vice-presidency of the company, in addition to his duties as general manager. The following year Mr. House was elected president of the combined properties to succeed ex-Governor Frank Brown.

In 1897 another consolidation of Baltimore properties was effected, the City & Suburban and Baltimore Traction Companies being merged into the new Baltimore Consolidated Railway, with Nelson Perin as president. Mr. House was made vice-president and general manager of this company. Two years later there was effected the consolidation which brought into one company all the traction properties in Baltimore. The company that succeeded to the different independent lines was the United Railways & Electric Company, with which Mr. House became connected as second vice-president and general manager. In 1907, shortly after the death of John M. Hood, he succeeded to the presidency.

Mr. House in the various offices that he held with the railway passed through some very trying experiences, but probably the most difficult problems he was called upon to solve followed the terrible fire in Baltimore in 1904. In this conflagration the central power station of the company and many miles of track and line were destroyed. In the work of reconstruction everybody did his part, but the job of directing the work of reconstruction fell to Mr. House and made unusual demands upon him.

It is 20 years since those trying experiences, but in the electric railway world the memory still lingers of the celerity with which the reconstruction of the system was carried out and of the part that Mr. House played in restoring order so far as the properties under his direction were concerned.

Earl J. Payden, manager of the Rock Island Southern Railway, Rock Island, Ill., several years ago, a member of the Chicago Traffic Club and in recent years associated with T. M. Cox in the central freight bureau in Galesburg, died Jan. 22 after an operation. Mr. Payden was 43 years old.

John Baillie Hamilton, commercial manager and tramway manager to the City Council of Leeds, England, died on Jan. 9 at the age of 69. He was at one time traffic superintendent and afterward assistant general manager of the Glasgow Corporation Tramways. He showed so much energy and ability that he was appointed general manager of the Leeds City Tramways more than 20 years ago. Under his sway the Leeds tramways developed into a great organization, with an annual revenue of about £1,000,000. Mr. Hamilton's organizing ability got further scope when he was appointed commercial manager to the corporation, a newly created post and one which has few if any analogies in Britain. As commercial manager he controlled more than 8,000 workpeople engaged in the tramway, cleansing and highways departments. He was one of the founders of the Municipal Tramways Association and was connected also with the Tramways & Light Railways Association, Institute of Transport and Tramways National Joint Industrial Council.

Glenn G. Howe, for many years senior vice-president of the Link-Belt Company, Chicago, Ill., died in Muskegon, Mich., on Christmas Day, 1924. He joined the Link-Belt organization in 1877 as an office boy. When the three related interests, the Ewart Manufacturing Company, the Link-Belt Machinery Company and the Link-Belt Engineering Company, were merged as the Link-Belt Company, in 1906, Mr. Howe became vice-president in charge of the company's Indianapolis operations. Later he organized the Howe Chain Company at Muskegon.

Charles R. Guthrie, inspector for the Westinghouse Traction Brake Company in New York City, died on Dec. 28, 1924. Mr. Guthrie was graduated from the department of science and technology at Pratt Institute in 1923. He entered the employ of the Westinghouse Traction Brake Company as special apprentice at the Wilmerding shops on July 10, 1923, and on Aug. 1, 1924, was assigned to the New York office. His duties have been assumed by V. D. Bethge, already a member of the New York office staff.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Swiss Maker in American Market

Plans Large Manufacturing and Sales Activity—Investment of Upward of $50,000,000 Contemplated

Laurence Wilder, American representative of Brown, Boveri & Company of Switzerland, makers of electric locomotives and equipment for power houses, announced on Jan. 26 that his company has decided to enter the American field. An initial investment of between $35,000,000 and $40,000,000 will be made. Negotiations are in progress for the purchase of a number of plants and the American Brown-Boveri & Company will probably be actively engaged in the electrical manufacturing business in this country within 90 days.

The plans call for the manufacture of all kinds of heavy electrical equipment. According to Mr. Wilder, the Brown-Boveri interests anticipate a good business in heavy traction and are prepared to furnish any type of system or locomotive desired. In Switzerland, Chile, France and Russia both direct-current and alternating-current electrifications have been made by this company, and a recent contribution has been the manufacture of several large Diesel-electric locomotives for the soviet government. Oil breakers and power mercury rectifiers are among other lines of activity. The company expects to add a complete electrical line of American manufacture and Brown-Boveri design in a short time.

The company controls a wide range of patents covering electrical apparatus in use in Europe, but not yet in the American market. As examples, Mr. Wilder has mentioned the Buchli drive for locomotives and the mercury arc power rectifier. It is said that the company will so direct its efforts as to be prepared to participate in the electrification of American railroads and extension of the use of superpower.

Brown, Boveri & Company, with main offices and plant in Switzerland, hold a position in Europe similar to that of the leading electrical manufacturers in the United States. The company employs many thousands of operators, has subsidiary plants in Germany, France and Italy, and it is not so many years ago that it took over and absorbed the European plant of the Westinghouse Electric & Manufacturing Company. For the last two years Brown-Boveri has had an agency in the United States, the chief purpose of which has been to test out the American market for Brown-Boveri products. It is said to be generally recognized all over the world that in some of its fields of operation there is no counterpart for the products of the Swiss company.

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Metal, Coal and Material Prices

Metals—New York	Jan. 27, 1925
Copper, electrolytic, cents per lb	14.875
Copper wire base, cents per lb	17.25
Lead, cents per lb	9.95
Zinc, cents per lb	7.97
Tin, Straits, cents per lb	57.875
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.45
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.45
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-lb. lots), N. Y., per gal	$1.15
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1347
Turpentine (bbl. lots), N.Y., per gal	0.94

Yellow Coach to Expand

Lehman Brothers and Goldman, Sachs & Company, New York investment brokers, have acquired a substantial interest in the Yellow Coach Manufacturing Company, and Robert Lehman and John M. Hancock have been elected directors. Additional large factory development is indicated by the formation of a $1,000,000 subsidiary to Yellow Cab of Chicago by John Hertz to operate "Drivurself" systems throughout the country. The passenger cars to be rented by the company, shown for the first time at the recent New York automobile show, will be made by the Yellow Coach Manufacturing Company.

Rolling Stock

United Railways, St. Louis, Mo., has ordered 15 White buses and has placed an order with the St. Louis Car Company for 15 steel bodies for these vehicles.

Houston Electric Company, Houston, Texas, it is reported, has purchased three new Reo buses from the R. W. Price Company, distributors for the Reo in Houston.

Newport News & Hampton Railway, Gas & Electric Company, Hampton, Va., is said to be in the market for buses to replace automotive equipment which has been in use on bus lines in Newport News recently taken over by the railway.

Youngstown Municipal Railway, Youngstown, Ohio, has arranged to replace the first seven buses used in Youngstown. The vehicles were authorized by the city of Youngstown under the provisions of its service-at-cost ordinance. The buses in question were Republic Knight chassis under bodies by Bender. The seven original bodies are being rebuilt for use upon the same number of White chassis. They were purchased and will be operated by the Youngstown Municipal Railway under the provisions of the service-at-cost ordinance.

Track and Line

Connecticut Company, New Haven, Conn., plans to relocate its tracks at Morse's Station, Woodmont, Conn., in connection with proposed new highway improvements. The tracks will be straightened out, which will eliminate a dangerous curve.

Detroit Street Railways, Detroit, Mich., will construct considerable new trackage during the present year which it is estimated will save the department $1,000 a day. The Jefferson-Grand River line will be split up, the Jefferson line being looped somewhere in the vicinity of City Hall and the Grand River around Capital Park. About $75,000 will be expended for new tracks at the Woodward Avenue carhouse. It is planned to combine the Clairmount and St. Jean lines into a crosstown belt line. Other connecting links are to be built, including one hooking the Fenkell line with the Northwestern Belt line leading directly to the Highland Park Ford plant. The proposed double-track extension of the Trumbull line to Fort Street is announced. A new carhouse for the northeast section is also proposed to save dead mileage on the Davison line. In summing up these major parts of the 1925 construction program Ross Schram, general manager, stated they would mean more and better service to the car riders of Detroit and a considerable saving in the department's expenses.

Trade Notes

Col. Eugene C. Peck, after a service of almost 25 years as general superintendent and later as works manager of the Cleveland Twist Drill Company, Cleveland, Ohio, has retired from active management. He will continue as a stockholder in the company and as a member of the board of directors. Serving as a member of the American engineering standards committee, as chairman of the standardization committee of the A. S. M. E. and as vice-chairman of the National Screw Thread Commission, he has been largely responsible for many of the much-needed reforms that have taken place in standards of practice.

Eisemann Magneto Corporation, New York, N. Y., announces that arrangements have been completed for the acquisition of the automotive business of the Duplex Engine Governor Company. The entire stock of raw and finished materials, special machinery and facilities for manufacture have been transferred to the Eisemann plant, and it is expected that but a slight interruption in production will occur. Both the well-known Simplex and Duplex models will be continued. Production is being organized and plans made for marketing a new developed mercury turbine governor very soon.

Okonite Company, Passaic, N. J., will open an office at 310 South Michigan Avenue, Chicago, on Feb. 1 and will take over the sale of Okonite products in the Western territory. Charles E. Brown, formerly vice-president of the Central Electric Co., has been appointed vice-president in charge of the territory west of Pittsburgh and east of the Rocky Mountains of the Okonite Company, with headquarters in Chicago. A. L. McNeill has been appointed manager of the railroad department. E. H. McNeill and Ray N. Baker have been appointed sales engineers. L. R. Mann has been appointed manager of the St. Louis office.

Premier Equipment Corporation, Houston, Tex., is the successor company to the Houston Railway Car Company. The business of the new company will consist of locomotive and car repairing, buying and selling cars, locomotives, rails and industrial equipment. The general offices will be at Calhoun Avenue and Interurban Viaduct. P. R. Plumb is retiring from the Houston Railway Car Company. The new company is composed of L. A. Wiltshire, formerly of the Birmingham Rail & Locomotive Company, Birmingham, Ala.; O. D. Cleveland of the Equitable Equipment Company, New Orleans, La., and M. R. Ducey, Houston Railway Car Company, Houston, Tex.

Pure Carbon Company, Wellsville, N. Y., announces the appointment of H. H. Miller as its Pittsburgh representative, with office located at 7719 Lyman Street.

The Okonite-Callender Cable Company, Inc., has purchased a plant in Paterson, N. J., where it will manufacture lead-covered paper-insulated cables.

American Wood Preservers' Association will hold its twenty-first annual meeting at the Congress Hotel, Chicago, on Feb. 3, 4 and 5.

New Advertising Literature

Rail Welding & Bonding Company, Cleveland, Ohio, has issued bulletin No. 112, describing Una rod 300, a recent development of its laboratory for building up cupped rails.

General Electric Company, Schenectady, N. Y., has issued a new 32-page bulletin, describing four improved types of oil circuit breakers. The bulletin contains illustrations and tables and covers details of construction, operation and characteristics.

Ohmer Fare Register Company, Dayton, Ohio, has issued a pamphlet entitled "The Human Factor," which describes the company's attitude on the human element as a factor in business.

Beaudry Company, Inc., Everett, Mass., has issued a descriptive circular of a new upright air hammer. This is furnished with rams weighing from 100 to 1,200 lb. All sizes are equipped with treadles and hand levers so that the hammers may be operated either by hand or foot.

Electric Machinery Manufacturing Company, Minneapolis, Minn., has issued bulletin No. 861 on electric power apparatus.

More-Jones Brass & Metal Company St. Louis, Mo., has issued an attractively illustrated and handsomely bound souvenir volume in commemoration of the 50th anniversary of the founding of its business in 1874. In this book, containing some 70-odd pages, are outlined the features of its organization and products which have been developed over a period of half a century. Photographs of the many personalities who have been a part of the romance of the brass industry are reproduced within these pages.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, February 7, 1925 *Number* 6

Assuring Success of the Midyear Meeting

PREPARATIONS for the Midyear Meeting of the American Electric Railway Association, which is to be held in Washington on February 17, have been carried on so quietly and efficiently that the date is almost here without its approach having been realized. Present indications are that it will be one of the most successful midyear meetings in the history of the association.

The program will take the form of a "town meeting" at which the main topics will be "What Are the Facts About Electric Railway Service" and "Motorbuses—When, Where and How They Should Be Used by Electric Railways." The outstanding character of men who will lead the discussion insures full and free consideration of both topics, which are of such vital importance to the industry that every electric railway executive who can possibly do so should attend.

In addition to the main sessions, Monday will be taken up with some 17 committees of the American and affiliated associations. Since the membership of the committees includes many leaders of the industry, a nucleus is assured for a most successful and inspiring meeting.

Interurban Activity Attracts Attention

NEWS developments this week indicate that at least one extremely successful utility executive is engaged in a program of acquiring interurban roads. That man is Samuel Insull of Chicago. He has just taken over the Chicago & Joliet Electric Railway and is about to take over the Chicago, Lake Shore & South Bend Railway.

Undoubtedly these apparently independent steps are part of a much larger plan. That is important. More significant at this time, however, is that this shrewd judge of utility values is buying interurban roads and that the roads are of a type that were considered by some not to have a very promising future.

Mr. Insull has always been a bull on the utility business. The growth of the properties under his management speaks for itself. Now he apparently is a bull on the interurban situation. Not so many years ago he acquired what is now the Chicago, North Shore & Milwaukee Railroad, a bankrupt interurban in apparently a hopeless condition. In 1923 that road was not only healthy financially but won the first Coffin medal. In the opinion of some, the North Shore line was in a situation unlike that of most interurban properties because it had the advantage of two large cities as terminals. The same has been said of another Insull road, the Interstate Public Service Company, operating between Indianapolis and Louisville. This condition does not apply in the case of the roads just purchased.

There are many interurbans elsewhere in the country similarly situated that lend themselves to such treatment as he apparently has in mind for his recent acquisitions. Whether or not such roads must be welded together to accomplish the best results depends upon the particular situation. But in any event the desired result can be achieved only by the intensive application of modern operating and merchandising methods. There is no other open sesame to success.

Atlanta Makes a Good Start

ATLANTA has at last fallen into line. That city is going to tighten the regulation of its jitneys. Atlanta has been slow to profit by the experiences of Toledo, Saginaw, Des Moines, Akron and the cities in New Jersey where railway service has been suspended in the past, but Atlanta's lesson appears to be a salutary one. Atlanta has been told and told and told the consequences of its mistaken policy with respect to jitneys, but it has refused to heed the warnings. It had evidence close at hand at Augusta of the effect of unfair jitney competition, but not until the dire consequences of what the suspension of service meant in the case of the Atlanta Northern Railway at Marietta did the realization sink in that the cry of distress was sincere that had been made by the Georgia Railway & Power Company.

Stated very briefly, Atlanta's idea now is to eliminate motor vehicles carrying fewer than 20 passengers, require an indemnity bond of $5,000 for each vehicle, issue no motor vehicle permits for routes on which railways operate, prohibit a bus line from running within two blocks of a railway line for a distance of more than five blocks on its round trip and, most important of all, rule out jitneys and buses entirely from the so-called congested limits of the city as defined by the fire department.

In adopting this sane course with respect to the jitney Atlanta is following the recent engineering advice given by the Beeler Organization, the details of which have been covered in articles appearing in this paper for Jan. 10, Jan. 24 and Jan. 31. The expert findings, intended to guide the future course of the city, said that the jitney has no place in any real transportation plan and that it is useless in mass transportation and worse where congestion is acute. The Marietta experience, under the very eyes of Atlanta, added the force of facts to these findings.

Eventually far-reaching effects may reasonably be expected to follow the negotiations that are sure to come as a corollary to the presentation of the recent engineering report. There is no gainsaying the fact, however, that the Marietta suspension, as indicated before, hastened action against the jitney—action that has been unreasonably delayed at a cost to the city that is incalculable. No matter what the eventual outcome, Atlanta is paying dearly for the mistaken policy which it has pursued. Having a report and acting on it are two dif-

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ferent things. The start has been made with respect to the jitney. It is to be hoped that this action is the forerunner of further favorable developments.

Publish Convention Dates Early

DURING the year, the total of all railway conventions and sectional association meetings amounts to a surprisingly large number of events. In many cases several meetings follow each other in rapid succession. Such conventions are much to be desired. The opportunity given railway men for comparing experiences helps to keep each man in touch with what his neighbors are doing, and adds stimulus and interest to the everyday tasks.

In many of these meetings the representatives of manufacturers take a prominent and important part. They frequently have places on the programs, and thus give to the operating men the benefit of their experience and observations as specialists.

Early publication of meeting dates will help these men to make up itineraries that avoid lost time and expense through taking long special trips. Not only will this saving be made, but early information of a coming meeting will enable men to attend who otherwise could not do so.

Transit Facilities in a City with 20,000,000 Inhabitants

THE present efforts in our largest cities to plan for future transportation facilities are especially welcome in view of the troubles which have come from past neglect. All of our large cities are adding rapidly to their populations. In the case of New York, it is estimated that by 1930 the territory within 40 miles of the City Hall will contain more than 10,500,000 inhabitants, and that in 20 years more the population within this area will be 17,000,000, of whom 7,000,000 will live outside the present limits of the city. This means a tremendous increase in demand for transportation in the metropolitan district which must be met, if congestion on all lines of travel in exaggerated form is to be avoided.

Two recent reports on suggested improvements in transit facilities between New York and its environs are abstracted in this issue. One relates to entrance to New York from Westchester County on the north, the other to better communication across the Hudson River. The former was prepared for the Board of Supervisors of Westchester County, while the latter was conducted by a state commission in New Jersey. Though prepared by different engineers, they have strikingly similar recommendations, which may be considered to be in line with present thought on the subject. In both cases, most of the traffic from the districts is by steam or electrified railroad to existing terminals. Each report proposes to transfer this traffic to a distributed terminal in the form of a subway in Manhattan Borough. The distributed terminal, in contradistinction to the concentrated terminal of the average trunk line railroad, is primarily a rapid transit idea. But the railroad terminals in our large cities are now so congested and their expansion with existing realty values would be so expensive that their owners would be glad to devote them to through traffic and be relieved of commuter travel. Their capacity would then be adequate for years to come.

Another point of similarity in the two plans is the idea of through train service. In the New Jersey plan, this would be accomplished by a loop which, in Manhattan, would extend from near the southern end of the island to about 57th Street and in New Jersey would join the trunk line railroads coming in from the west. In the Westchester project, through traffic is suggested by an extension of the Manhattan subway to New Jersey, connecting possibly with a North Jersey rapid transit system.

Rapid transit extensions of the kind described are bound to be an important development of electric railways during the next few decades. In many cases, of course, electrification of the connecting steam suburban lines must follow to give through running and obtain the best results.

Publisher Responsibility— Reader Opportunity

NO ONE can project himself very far into the future and read ahead with any great degree of accuracy. The times move too fast for that. Men can, however, keep themselves well informed. In fact, the tendency is growing to weigh cause and effect much more carefully than in the past. In addition the standard of business ethics is much higher than it was. The injection of engineering elements more and more in business has had the effect of making business more exact. It is not repression, but an added feeling of responsibility that is abroad, and nowhere does this feeling of responsibility manifest itself to a greater degree than in the business press of the country. This sense of responsibility is constantly being borne in upon the editors of the McGraw-Hill papers, of which ELECTRIC RAILWAY JOURNAL is one.

Working out in the field the editor must preserve his individuality. His responsibility is first to his readers and then to his industry, but beyond that his great responsibility is to the general public. These considerations and others were emphasized at the recent annual convention of the business and editorial staffs of the McGraw-Hill publications held in New York. At that meeting Herbert Hoover, through the medium of F. M. Feiker of the Society for Electrical Development, said that the business press is probably the greatest force in making industrial opinion. Men do get together in the physical sense at conventions and meetings to exchange ideas and they do so with good results to themselves and to their industry, but it is through the medium of the business press that the real avenue is opened to them for the discussion of problems in which they are interested.

After all, as Mr. Hoover has so aptly put it, the industrial press has been in large part responsible for the change from rule-of-thumb and *laissez-faire* methods to scientific determination of facts and programs of action based on facts. Every issue of ELECTRIC RAILWAY JOURNAL and every page of every issue is edited with that end in mind. Facts do not always lend themselves to statistical presentation, but facts remain facts even though the romantic method of presentation be applied to them, as is often done in the industrial press. No two men will probably ever interpret facts exactly alike. That would be expecting too much. Business cannot, however, form a right judgment unless it knows the facts. It is the province of the business press to supply the facts.

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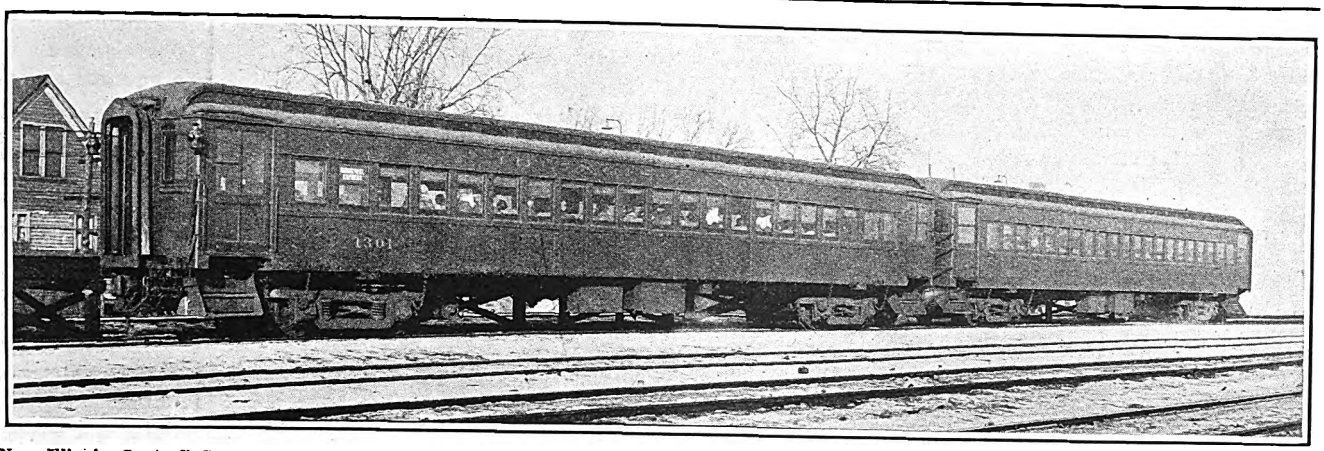


New Illinois Central Cars Similar to These Will Operate on the 1,500-Volt D.C. Circuit in Chicago Suburban Service. A Motor Car and a Trail Car Are Semi-Permanently Connected to Form a Unit. A Train Is Made Up of from One to Five Units

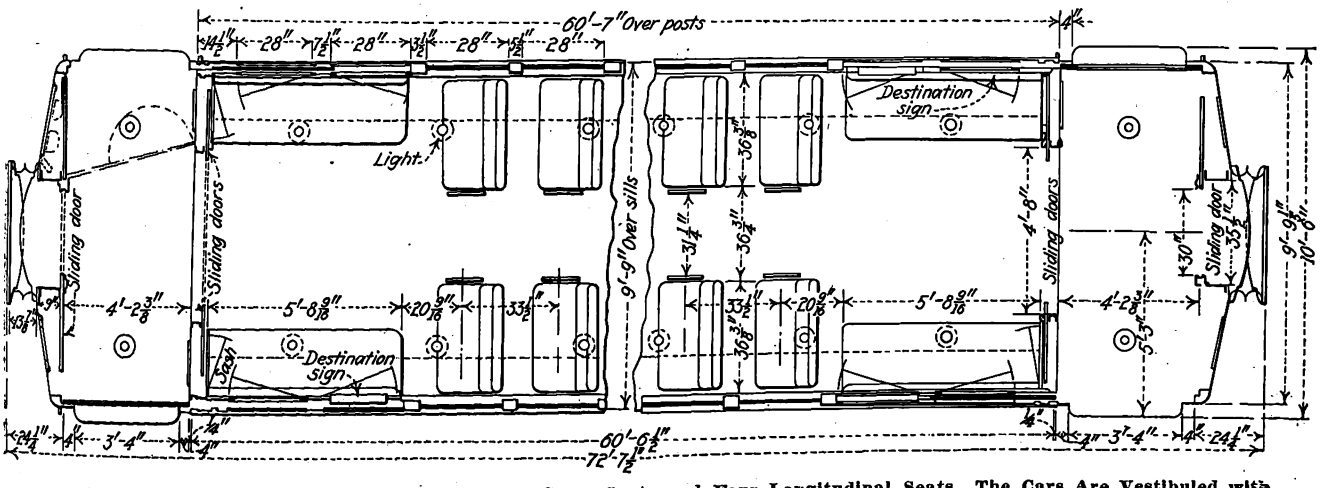
I. C. R.R. Cars for Chicago Electrification Designed for Heavy Service

Steam Railroad Practice Followed in Design of M-U Suburban Cars — One Motor and One Trail Car Semi-Permanently Connected—Lighting on 32-Volt Battery Circuit—Cars to Be Operated from 1,500-Volt D.C. Catenary Trolley

SAFETY, speed and passenger comfort were given first consideration in the design of the 215 new suburban cars recently ordered by the Illinois Central Railroad for use on the lines now being electrified in Chicago and vicinity. These cars will be operated over the Chicago Terminal Division, which extends into the suburbs on the south side of the city. They will be similar in construction to 45 trail cars now in the same service but at present being pulled by steam locomotives. Of the 215 new cars, 130 will be motor cars built by the Pullman Car & Manufacturing Corporation. The other 85 new cars will be trailers built by the Standard Steel Car Company. These, together with the 45 cars now in steam service, will give the company 130 suburban trailers. One motor car and a trail car will be semi-permanently connected. These two cars thus connected will be called a unit and trains will be made up of units as traffic demands. The number of cars on hand and on order provides for 130 such units. The maximum length of train will be five units or 10 cars.

Steam railroad practice is followed closely in the design and construction of the cars. They are 72 ft. 7½ in. over buffers and 9 ft. 9¼ in. over side sheets. The construction is of steel and aluminum alloy throughout. The motor cars will weigh 125,000 lb. and the trailers 84,000 lb. As each car seats 84 passengers, the weight per passenger for the motor cars is 1,490 lb. and for the trailers 1,000 lb.

Like the present steel suburban cars, the new cars will have monitor type roofs, inclosed vestibules and single-sash windows. As flush platforms are installed at all stations, steps will be provided at one end of the trail cars only, for emergency use. The cars will be painted on the outside with standard Illinois Central Railroad green and will have mahogany finished aluminum interior trim with white Agasote ceilings and maroon mastic floors.



Seats for 84 Passengers Have Been Provided on 34 Cross Seats and Four Longitudinal Seats. The Cars Are Vestibuled with Diaphragms Between Cars. Sliding Doors Permit Easy Entrance and Exit

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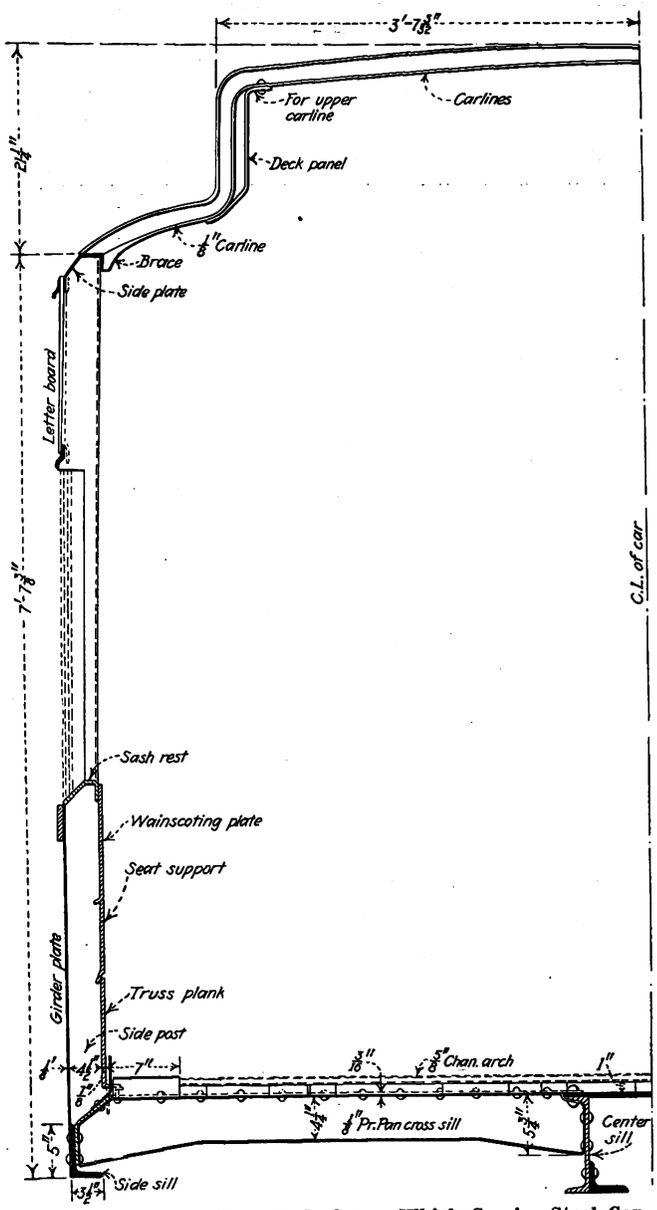
Steel structural shapes, pressings and castings are used in the underframe construction. The center sill consists of a box girder built up of two 9-in., 15-lb. channels with top plate. The side sills are 5-in. x 3½-in. x ⅜-in. angles. On the motor cars all sills extend from one buffer casting to the other. On the trail cars the side sills extend from the buffer casting at the control end to the body end sill at the opposite end, to allow for step wells at that end of the car. The car flooring is



Section of Heavy Steel Underframe Which Carries Steel Constructed Body Having Aluminum Roof and Inside Trim

carried on six steel stringers and three wood stringers, which are supported by pressed steel pan cross sills spaced on 33½-in. centers. The floor supports at the side sills are 2½-in. x 1½-in. x ⅜-in. angles riveted to the side posts. Intermediate floor stringers of the same size are located between the center and side sills. The center supports consist of two Z-shaped pressed members riveted to the center sill. The wood supports are placed between the steel stringers.

The body bolsters are built up of two pressed steel pans of ⅛-in. steel, placed back to back 10 in. apart and reinforced by ⅛-in. top and bottom cover plates. Two cross-bearers near the center of the car are built up of ¼-in. pressed steel pans with top and bottom cover plates and act as auxiliary bolsters serving to stiffen the frame. The platform floor is one piece of ⅜-in. diamond pattern sheet steel. This acts as an anti-telescoping plate on the motor cars and at the control ends of the trail cars.

In the body of the car the sub-flooring consists of No. 20 gage galvanized copper-bearing sheet steel, covered with one layer of three-ply Salamander felt. A ½-in. air space separates this from the top flooring, which is No. 22 gage Chanarch corrugated steel with a section depth of ⅝ in. This is placed crosswise of the car, and the floor wearing surface, of Johns-Manville mastic, is laid ⅜ in. deep over the top.

Two pressed steel channels with cover plates approximately 6 in. wide form side posts of box construction. These are spaced on 2-ft. 9½-in. centers and extend from the side sill angles to the side plates at the eaves. The side girder plates are ⅛-in. steel, riveted to side sill angles, posts and flange of the sash rest. Above the single sash windows is a ⅛-in. steel letterboard 15 in. wide.

The monitor type roof is carried on continuous pressed U-shaped steel supports, which extend from side plate to side plate. They are spaced on 2-ft. 9½-in. centers, the same as the side posts. On the motor cars the carlines over each bolster are designed to carry a 1,000-lb. pantograph. Deck frames, eave moldings, upper and lower decks of the roof are covered with ⅛-in. sheet aluminum alloy.

Insulation against cold consists of two layers of three-ply Salamander on the insides of all outer side sheets, body end sheets and the undersides of both upper and lower deck roof sheets. The sliding vestibule door pockets are insulated in a similar manner.

Of the 21 windows on each side of the car, the two located at each door pocket have a stationary outside sash and an inside sash arranged to swing open to give access to the door track and mechanism. The other side windows are single sashed, arranged to raise, and are provided with Pantasote curtains. The glass is set in a mahogany frame, which has rubber weather strips at top and bottom.

Electrically Operated Door

The electrically operated outside sliding doors on the sides are operated by electric motors controlled by push buttons located in the vestibules. These and the hand-operated double doors in the bulkhead between vestibule and car body are of aluminum. All doors on a side may be opened from either end of both cars of the unit, or each door may be controlled individually. This arrangement allows one guard or trainman to operate the doors of two units or four cars. A door-control switch in the motorman's cab permits separate control of the adjacent door. Each door has a safety contact shoe in the edge, with a rubber sheath over a phosphor bronze spring. The electric door engine will stop its movement if a passenger is struck by the door in closing. After the obstruction is removed the door will continue its motion. A signal light notifies the motorman in the front cab when all the doors in the train are closed. By connecting this circuit through the reverser lever, a green lamp is lighted when the train is being operated forward and a yellow lamp is lighted when the train is reversed. The door operation and signal system are on the 32-volt battery circuit. This equipment is to be furnished by the Consolidated Car Heating Company.

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Pantograph safety gates are attached to each corner of the car. Those on the control end have face plates and are held in the open position by springs, to press together the face plates of two adjacent units. The safety gates between the motor and the trail cars have no face plates, but may be easily uncoupled from either car.

Two pantographs mounted on the roof of each motor car collect the 1,500-volt direct current from the catenary trolley wire. One of these will be used in regular service, the other in emergency.

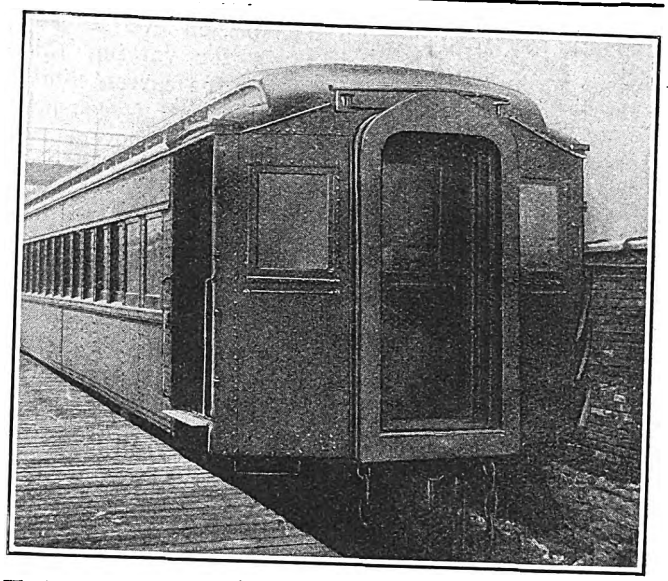
A headlight mounted above the vestibule door at the control compartment end contains a 100-watt, 32-volt, concentrated filament lamp, backed by a "Golden Glow" reflector in which the bulb is adjustable for focus. Without dimming resistance, the headlight throws a beam of approximately 130,000 cp. Electric tail lights are mounted on brackets at the rear of the train.

The motor cars are mounted on 50-ton capacity trucks with 6-in. x 11-in. journals and the trail cars on 40-ton capacity trucks. These trucks are four-wheel Commonwealth Steel Company's cast-steel design, with "Simplex" clasp brakes. Each motor truck carries two 750-volt motors of 250-hp. nominal rating, permanently connected in series. Westinghouse A-2971 motors are used on 65 of the motor cars, while the other 65 will have General Electric No. Z-1231 motors. The motors are inside hung. The motor trucks have 38-in. rolled steel wheels and the trailer trucks 33-in. rolled-steel wheels. The trucks, particularly in the spring suspension, are designed to give easy riding qualities, insuring safety at high speeds.

Interior Fittings

Thirty-four reversible cross seats and four longitudinal seats are used. On 190 cars the seats are to be supplied by Hale & Kilburn, while on the other 25 cars Heywood-Wakefield seats will be used. These are covered with natural color rattan and have high backs and 36-in. cushions, 18½ in. above the floor. No arms are provided, allowing a 36-in. aisle between seat backs. The seats are spaced on 33½-in. centers, a seat being opposite each window. Each longitudinal seat accommodates four passengers alongside of two windows at the end of the car.

Rattan High Back Seats, Mahogany Finish Aluminum Trim, White Agasote Headlining and Maroon Painted Mastic Floor Feature the Interior



Flush Station Platforms Render Car Steps Unnecessary Except for Emergency Purposes

Electric heat with thermostatic control is furnished by 34 cross seat heaters dissipating 750 watts each, eight longitudinal seat heaters of the same rating and a cab heater of 1,000-watt capacity. These operate with 17 coils in series on the 1,500-volt circuit. A piece of sheet aluminum covers the bottom of the seat, while a narrow guard plate mounted directly in front of the heater prevents passangers coming in contact with it. Electro-pneumatic 1,500-volt heater switches are controlled by two thermostats, one of which cuts off the heat at 50 deg. and the other at 70 deg. The former is for use when the car is in the yards and the latter when the car is in service. A selector switch allows either one to be used. The thermostat actuates a relay through a 32-volt circuit.

Interior illumination is by means of 28 bracket fixtures with 25-watt, 32-volt lamps. These are mounted on the lower deck of the ceiling at the lower deck sill. Two enameled reflectors and sockets are flush in each vestibule hood. These and the body lights are in five lighting circuits.

A 1,500-volt to 32-volt motor-generator set on each motor car gives low voltage current for operating auxiliaries and charges a 32-volt, 300-amp.-hr. Edison storage battery for reserve purposes mounted under the trail car. The charging is controlled by a reversible watt-hour meter. By using 32 volts for the motor control, door operation, signal system and car lighting it has been possible to confine all 1,500-volt wiring except for the heaters to conduit below the floor. Even the watt-hour meter has been mounted under the car and a distant dial actuated by the 32-volt circuit has been placed in the motorman's cab.

Electro-pneumatic multiple-unit control of the General Electric Company PC 103-A type is used. Control cabs located in opposite ends of each unit contain master controllers of the horizontal type, reverser levers, air brake valves, remote-control switches and other operating accessories. The apparatus is inclosed between the front bulkhead and a swinging door, which when opened engages a small swinging panel mounted on the body end panel and thus forms a cab. Six points are provided on the control quadrant, namely, off, switching, series running, full field notching, parallel running, normal field. The control is designed for

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automatic acceleration at 1.5 m.p.h.p.s. on level tangent track. Provision has been made for varying this acceleration rate through by-passing the current limit relay. This allows the speed of the control sequence to be controlled independently by successive movements of the master controller handle between notching and running positions. Each movement by-passes the current limit relay one step only.

The master controller has the usual safety handle. Its release opens the main circuit breaker and makes an emergency application of the air brakes. A line relay opens when the line voltage falls below 500.

GENERAL DIMENSIONS OF NEW ILLINOIS CENTRAL CARS

Length over buffers	72 ft. 7¼ in.
Length between pulling face of couplers	72 ft. 2 in.
Length over body corner posts	60 ft. 7 in.
Length over end sills	60 ft. 6½ in.
Length between truck centers	47 ft. 9 in.
Width over all at eaves	9 ft. 11½ in.
Width over belt rail rivets	9 ft. 10⅞ in.
Width over side sheets	9 ft. 9½ in.
Width over platform at vestibule side door	10 ft. 6 in.
Height, rail to center line of coupler	2 ft. 10¼ in.
Height, rail to bottom of side sill	3 ft. 7½ in.
Height, rail to bottom of center sill (at truck)	3 ft. 5½ in.
Height, rail to top of carline	13 ft. ⅛ -n.
Height, rail to top of platform	4 ft. 3⅝ in.
Clear opening, body and door	4 ft. 0 in.
Clear opening, vestibule side door	4 ft. 0 in.
Clear opening, vestibule end door	2 ft. 2 in.
Seat spacing, center to center	2 ft. 9½ in.
Aisle spacing, at seat ends	2 ft. 7½ in.
Aisle spacing, at seat backs	3 ft. 0½ in.
Number of cross seats on each side	17
Total seating capacity of car	84

Tomlinson automatic radial couplers on opposite ends of the unit contain facilities for connecting the 19 wires of the train control and signal circuits and the brake and reservoir air lines. A push-button control allows the motorman to couple and uncouple any desired combination of two-car units without assistance. An interlock with the control circuit prevents operation of the motors in the event the couplers fail to lock. Another feature incorporated in the couplers is the automatic completion of the door signal circuit when the coupler is uncoupled. Adapters are provided for emergency use in coupling the automatic tight-locking couplers with a standard A.R.A. coupler.

Air Brakes Are of the Electro-Pneumatic Type

Electrically controlled air brakes of the New York Air Brake Company's PS type give the trains of 10 cars or less a smooth retardation at a normal rate of 1.75 m.p.h.p.s. This equipment is capable of braking at a rate of 3 m.p.h.p.s. or more with an emergency application. It is designed for the following performance: Electric application of the brakes on all cars simultaneously in any desired degree from light service to emergency when the motorman's valve is placed in the desired position; a pneumatic service application, release and emergency application in the event of failure of the electric control. The service brake cylinder pressure is 60 lb. per square inch and the emergency cylinder pressure is 110 lb. per square inch.

Each motor car is provided with a 35-cu.ft. air compressor driven by a 1,500-volt motor. The governor maintains a pressure of 110 lb. per square inch in the main reservoir, and all governors on a train are electrically connected so that any governor cuts in all of the air compressors. The motors are capable of driving the compressor against a 115-lb. reservoir pressure when the line voltage is 1,350. They are capable of operating 100 per cent of the time, but normally will operate only 50 per cent of the time to furnish air for the brake equipment, motor control apparatus and the air whistle on one unit.

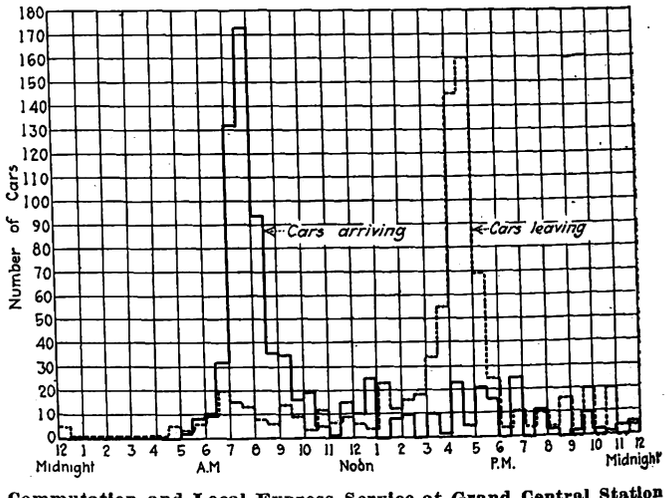
In the design and construction of the car and its apparatus, including motors, trucks, control and couplers, the local suburban schedule to South Chicago was shown to be that service producing the highest root mean square current to which the equipment will be subjected. For the purpose of computing motor heating, this schedule is figured without coasting between stops. The difference between the actual schedule time and the no-coast time represents speed margin. As much coasting as possible will be introduced into the schedules. Stopping times at the various stations are taken as 18 seconds, with the exception of the first stop at Van Buren Street, which is figured at 25 seconds.

Plans for Westchester Traffic

Report by H. M. Brinckerhoff Shows the Need for Present Planning—It Recommends that Suburban Trains Use a Subway in New York City

THE solution of the transportation problem of Westchester County, New York, just north of New York City, lies in operating suburban trains downtown in a subway instead of to the Grand Central Station, according to a report recently prepared for the Westchester County Transit Commission by Henry M. Brinckerhoff, of Parsons, Klapp, Brinckerhoff & Douglas of New York. It is an interim report and considers the needs and the physical aspects of the proposed plan. A further report, devoted in part to the legal and financial problems involved, will be submitted about March 1.

The need for better traffic facilities is shown by the fact that the passengers carried from the territory concerned on the New York Central and New York, Westchester & Boston lines and the total figures of the New Haven suburban service amounted in 1924 to about 40,000,000. For the last 10 years the growth on the New York Central lines has been about 8 per cent per annum, and if the new line is built it is estimated that this traffic would more than double within a few years after completion of the line. The accompanying chart shows the number of cars arriving and leaving Grand



Commutation and Local Express Service at Grand Central Station

This chart shows the number of cars per hour arriving at and leaving Grand Central Station in commutation and local express service on a typical day in September, 1924. The cars are plotted on Eastern Standard time and New York City at this period was on daylight-saving time.

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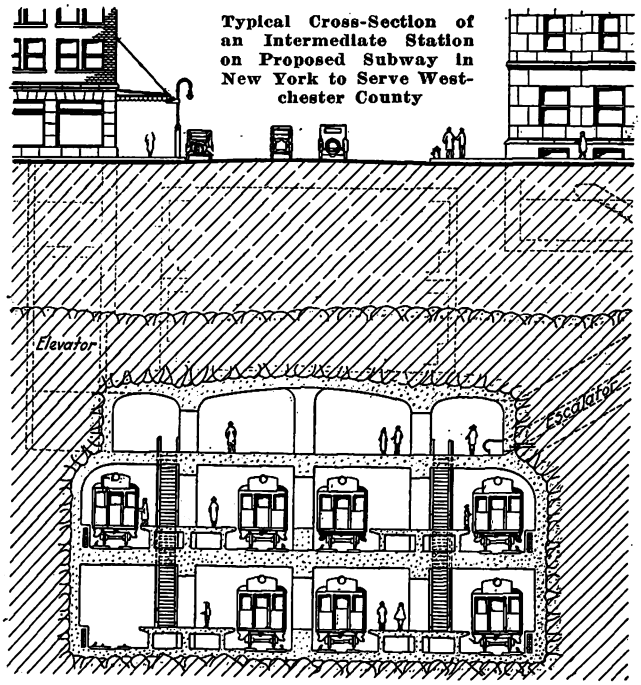
Central Station on all suburban lines on a typical day during September, 1924. The chart is plotted on Eastern Standard time, but New York City during that period was on daylight-saving time. The rush-hour peaks are very pronounced, and it will be noticed that the morning peak is higher and somewhat sharper than the evening peak.

The report recommends that the suburban trains of the existing New York Central lines—Hudson River division, Putnam division and Harlem division—together with the New Haven and Westchester & Boston



Typical Cross-Section of an Intermediate Station on Proposed Subway in New York to Serve Westchester County

suburban service, be brought together at a point in Bronx Borough, then passed by subway to a downtown terminal near the City Hall. The junction point recommended in Bronx Borough is at 149th Street, and the subway from that point would pass down Madison Avenue to Madison Square and thence down Fifth Avenue and West Broadway to the lower terminus. It would preferably be four-track on two levels, though cost estimates are also given for a three-track and a two-track subway. The tubes would be carried at a low level to leave sufficient space above for the construction of two levels of city subways of standard type, and the subway would pass largely through rock. The plan contemplates two intermediate stations between the northern and southern ends of the subway. At these stations each track would branch so as to pass on either side of a central platform and allow the trains on that track to berth alternately on opposite sides of the platform. This would increase the time allowable for stops. The station would be reached from the street level by stairways and elevators or escalators, and there would be escalators and stairways between the three platform levels. A typical intermediate cross-section, as proposed, is illustrated.

The suggestion is made that it may be found desirable to carry two of the four tracks from the proposed terminal station near the City Hall west under the Hudson River to reach New Jersey. Certain operating economies would be gained by this extension, but it would involve higher fixed charges.

The estimated cost of the proposed subway ending near New York City Hall and including a station at that point and two intermediate ones, but exclusive of rolling stock, would be: For a two-track subway, $95,000,000; for a three-track subway, $115,000,000; for a four-track subway, $150,000,000.

Tests Show Two-Motor Trackless Trolley Better

Comparison of One-Motor and Two-Motor Vehicles Made by Detroit Department of Street Railways Under Actual Road Conditions for Wide Range of Speeds and Voltages

THE possibility of trackless trolley operation in outlying areas at an early date led the Department of Street Railways, City of Detroit, to conduct a series of power demand and acceleration tests on two types of trolley buses last summer. These tests were conducted as a preliminary to a traffic investigation which was made in the College Park and Grand River districts, two newly developed tracts in the northwestern section of the city which required transportation. One of these investigations was described in ELECTRIC RAILWAY JOURNAL for Jan. 24, page 129.

The results obtained from these tests, made under the direction of L. R. Wagner, acting electrical engineer, proved of sufficient consequence materially to influence the management in the choice of buses which may be purchased when a trackless trolley line is put into operation.

Heretofore tests made on trackless trolley buses have consisted largely of power consumption, which while of utmost importance do not give all the essential facts required of the bus performance. It is essential to know the starting demand in order to provide adequate power and overhead facilities. As the trackless trolley is used in service having a large number of stops per mile, it is necessary to know the acceleration of the different types of buses, as this has a definite bearing on the schedule speed which the buses can maintain.

The one-motor bus was a Brill trackless trolley equipped with Goodrich semi-pneumatic tires, weighing 12,000 lb. light and seating 29 passengers. It was propelled by one GE-265 motor (35 hp.) geared 7.85 to 1. The two-motor bus, which seated 28 passengers, was

OPERATING CONDITIONS OF THE FOUR DETROIT TRACKLESS TROLLEY TESTS

	One-Motor Bus		Two-Motor Bus	
Seating capacity	29		28	
Tires	Semi-pneumatic		Front solid Rear cushion	
Motors	One 35 hp.		Two 25 hp.	
Total rated horsepower	35		50	
Gear ratio	7.85		5.8	
Weight of bus, empty, lb.	12,000		13,000	
Test number	1	2	3	4
Weight of load, lb.	1,000	9,500	1,200	1,200
Total weight loaded, lb.	13,000	21,500	14,200	14,200
Average volts during tests	492	495	398	481 434 373
Average temperature, deg. F.	70	72	75	75
Type of paving	Asphalt	Asphalt	Asphalt	Concrete

built by the St. Louis Car Company and was equipped with Sewell wheels having cushion tires on the rear and solid tires on the front wheels. This bus weighed 13,000 lb. light, and it was equipped with two 25-hp. Westinghouse motors, geared 5.8 to 1.

Five test runs were made on the one-motor bus carrying a load of 1,000 lb. in test crew and passen-

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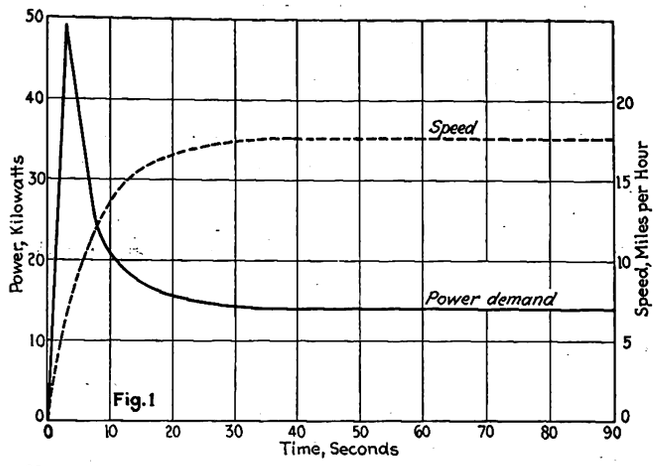
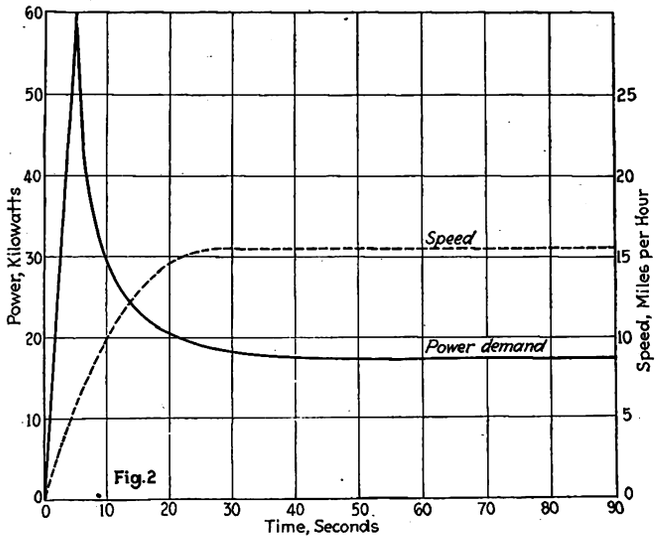
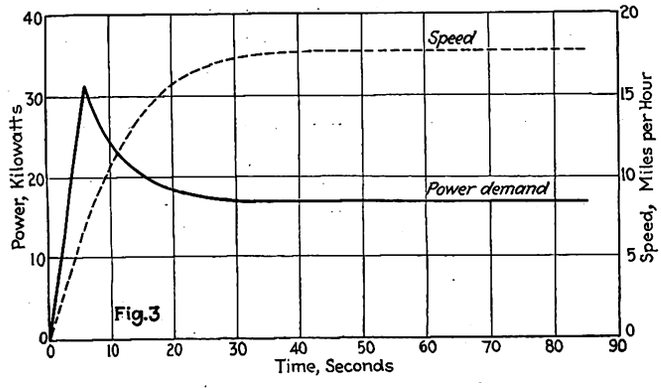
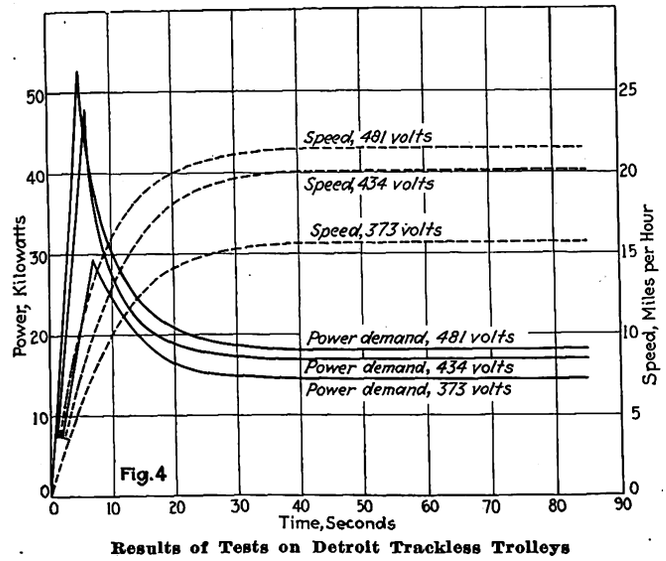








Results of Tests on Detroit Trackless Trolleys

Figs. 1 and 2, equipped with one motor; Figs. 3 and 4, equipped with two motors.

gers. The vehicle was run over asphalt pavement in good condition, being clean and dry during the test. The results are shown in the table and Fig. 1. It will be seen that the maximum power demand was 49.2 kw., while the demand at a free running speed of 17.6 m.p.h. was 14 kw.

A second set of five tests was carried out on the same bus under similar conditions when carrying a weight of 9,500 lb., consisting of the test crew (500 lb.) and 9,000 lb. of cement. In this test, shown in the table and in Fig. 2, the power peak was 60 kw. and the demand at the free running speed of 15.5 m.p.h. was 17.4 kw.

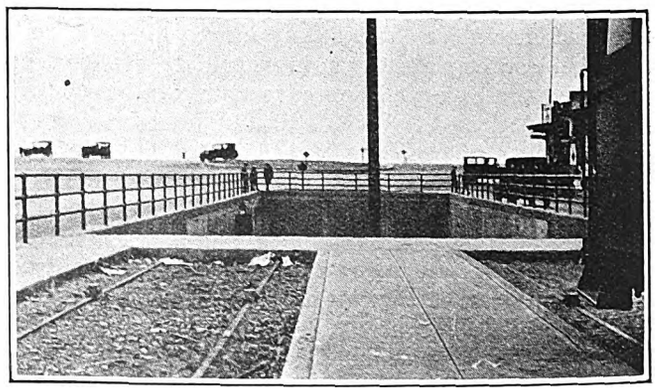
Four tests were made on the two-motor trolley bus on asphalt pavement in excellent condition. The power peak when starting a load of 1,200 lb., consisting of testers and passengers, was 31.4 kw., while the demand at the full speed of 17.7 m.p.h. was 16.8 kw. The results are shown in Fig. 3.

A final series of tests was made on the same bus on a concrete road in good condition, with a load of 1,200 lb. as before. In these tests the trolley potential was reduced, being 481 volts, 434 volts and 373 volts. The peaks for these three voltages were respectively 52.5 kw., 48 kw. and 29.4 kw. The speeds reached for the three conditions of voltage were 21.5 m.p.h., 20 m.p.h. and 15.6 m.p.h., the power demands corresponding being 18 kw., 16.8 kw. and 14.4 kw., as shown in Fig. 4.

The foregoing results show that the two-motor bus was able to reach a speed of 20 m.p.h. at 434 volts, with a maximum starting demand of 48 kw. While the one-motor bus reached a speed of only 17.6 m.p.h. at 492 volts, with a maximum starting demand of 49.2 kw., showing conclusively that with similar voltage the two-motor bus will run at a higher speed, it will have a much more rapid acceleration, and the maximum starting demand will be lower than in the case of the one-motor bus.

Subway for Street Car Passengers

THE lines of the Market Street Railway, San Francisco, Cal., operating out Sloat Boulevard terminate directly in front of the new municipal swimming pool. Automobile traffic makes crossing the boulevard at that point quite hazardous, so the tracks were lowered and a concrete subway built. This permits



Subway at Market Street Railway Terminal Provides Safe Crossing of Boulevard to Swimming Pool

passengers to reach the swimming pool without the necessity of crossing the boulevard. The incline leading to the subway is surrounded on three sides by heavy railing and concrete walks on either side of the tracks make an attractive as well as convenient terminal.

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Accounting for Stores

An Outline of the Principles for Keeping Track of Stock and Issuing It for Use in Repair Work from the Main Storeroom, from Several Storerooms and Under All Conditions

By R. A. Weston, C. P. A.

Special Accountant the Connecticut Company
Formerly General Storekeeper New York, New Haven & Hartford Railroad and Its Electric Subsidiaries

THE principal requisites for good storekeeping on an electric railway are: System, organization, personnel and facilities. By facilities are meant sufficient space, suitably arranged and located, in which to store and care for the stock of materials that must be maintained to provide for the operating requirements of the system. These stocks are just as truly a part of the company's assets as is its cash, and should therefore be well safeguarded against loss, deterioration, improper use, or use without proper authority and accounting.

The duty of caring for these stocks and of properly accounting for them should not be committed to those who have to do with the use of the material. This principle is now well recognized, and the official designated as storekeeper or general storekeeper should be independent of officials in departments that apply or put the materials into use.

Unfortunately, the importance of the storekeeper's position is generally underrated, and the work is delegated to a man of medium or ordinary ability, with a salary to correspond. This is a serious mistake and one of the reasons why store departments do not function as they should. For this position a man of good caliber should be chosen, one who has had extended experience in this work and can rank in ability alongside of such officials as master mechanics and roadmasters, and his rate of pay should compare favorably with theirs. If the system is a large one, there should be a general storekeeper, in authority over the other storekeepers, and he should rank with other heads of departments. A storekeeper of such caliber will not only see to it that the materials are properly conserved and intelligently ordered, but he will realize the importance of correct accounting and see that it is done. Such a man will also find many more ways to save the company money than a man of medium ability, and the resulting savings would amount to many times the difference in the salary paid.

Material Used for Maintenance of Equipment

A rule of prime importance which the system must be arranged to carry out is that material must not be charged to expense accounts until used or about to be used, in order to keep the operating costs and the asset accounts correctly stated. This is somewhat difficult, and in some cases it may not be practicable to comply literally with this rule, but if the facilities previously mentioned are provided, a practical compliance with the rule can be arranged. Theoretically, also, all material should be kept under the physical control of the storekeeper, and issued from the storeroom to the workman, on approved requisition, when and as he requires it to use or apply. It will be interesting now to consider how the conditions vary with respect to issuing and accounting for the materials required by the different departments. They will be considered in this order: For repairs to equipment, material for power stations and material for the line and track.

The main repair shop of the company is usually the largest customer of the store, and generally the storeroom is located adjacent to it. If the storeroom and the shop are very close to each other there need be no difficulty in requiring that all materials shall be drawn from the storeroom only when and as actually needed. If the storeroom is some distance away, too much time will be lost if special trips have to be made for the smaller and more inexpensive kinds of material. In such a case, a small working stock of such items may be placed in the shop near the work. The list of such items should be carefully made up by the storekeeper and master mechanic, and it should be quite restricted. This stock should be kept labeled and in order by the storekeeper, otherwise the workmen will soon have it badly mixed up.

This stock should not be charged to expense account when placed in the bin but should remain a part of general stores, entirely subject to the control of the storekeeper. After some of the stock has been used and it becomes necessary to replace it, a requisition should be issued for the replacement, and the charge made. It will be noted that this charge is for material that has actually been used and that the working stock in the shops is at all times a part of general stores and entirely under the control of the storekeeper.

There are some materials for equipment repairs that cannot well be handled physically in the storeroom. Among the most important of these are car wheels and axles, both mounted and unmounted. Some difficulty is experienced in properly accounting for them. Almost invariably the shop foreman will care for this kind of stock, and will press wheels on and off of axles and apply them to cars with little reference or information to the storekeeper. It is not uncommon to find the foreman giving the storekeeper a requisition for charging out purposes whenever he takes a new wheel from stock to press onto an axle. However, to make a charge to expense accounts at this time is incorrect, because the pressing of a wheel onto an axle is not a use of the wheel in repair work, but only getting it into a form in which it can be used. The use does not occur until the axle and pair of mounted wheels are placed under a car.

The character of such stock is continually changing. A pair of new wheels mounted on a new axle may be applied to a car, and of those removed one wheel and the axle may be good and the other wheel scrap. The scrap wheel will be pressed off the axle, and a good second-hand wheel may be pressed on and the mounted pair held as a spare in place of the new ones used. In this manner, after a short period has gone

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by the character of the stock has very largely changed. Also to be dealt with are steel wheels, cast-iron wheels and steel-tired wheels, and the application and removal of wheels both at the main repair shop and at the outlying operating carhouses.

To do this accounting work correctly there must be a system of charge requisitions and of credit requisitions. In the illustration just given, when the pair of new wheels and the axle were applied a charge requisition would be made out, together with a credit requisition for the pair of wheels and axle removed. In both requisitions, the character, kind, condition and size of both wheels and axles should be given. These requisitions would go to the storekeeper and enable him to make a correct charge and credit. If the credit requisitions are not made, the operating expenses are not credited until the time comes to take an inventory, or to sell the scrap, wheels and axles. This results in a distortion both of the stock account and the expense account, and is the cause of a considerable amount of the inventory discrepancies that have to be periodically adjusted. Some companies keep a wheel record to determine the mileage obtained, and reports are made by shop foremen of wheels and axles changed, applied, removed, scrapped, etc. Another way of handling the accounting would be to have the requisitions for charge and credit purposes made out from such reports in the office where the wheel record is kept.

Other items need special attention with respect to their accounting, such as motor armatures that are being continually removed, rewound and used again; field coils that are impregnated, varnished or painted and reused, and various other parts of equipment that are repaired and again put into use. Again, when cars become obsolete and are scrapped, parts of their equipment, such as air motors, etc., are saved and used in repair work. Often such parts are not turned into the storeroom but accumulate around the repair shops. Usually, the records and the accounting for such parts are poor, and they are not under good control as regards their availability for use at different points.

Closely related to the issue of material for use at the shop will be the issue of material needed for lighter repairs at the outside operating carhouses. All such material should be strictly in the stores account and under the reasonable control and jurisdiction of the storekeeper. This can be treated in a manner similar to the working stock described previously in the case of the main shop, except that the carhouse foreman will need to be relied upon to make the requisition for replenishing the stock instead of the storekeeper. To insure good results, a simple stock book system should be used by the foreman. It need require no bookkeeping but simply show that his stock is kept in good order and that a count is made and entered in the book once a month. This, coupled with a monthly visit from the storekeeper or his assistant, will result in this stock being kept at minimum and its accounting well handled.

Materials Used at Power Stations

The accounting for power station material is often very poor. Usually the station is not located near the shop storehouse, where its materials can have the immediate supervision of the storekeeper. The care and accounting for these materials must be left to the power station engineer, who usually does not maintain any stock or price records and who will not always describe the material on a requisition in the same way. It is remarkable, too, how frequently in the construction of, and additions to, power plants that proper provision is not made for the storage of supplies and of spare parts. In consequence, the materials are scattered all around the plant in a manner that discourages intelligent ordering and correct accounting.

The remedy would seem to be to provide a suitable storage place, assemble the stock together in order, place it under lock and key, restrict unlimited access to it and place it in the general stores account. Then, if the employment of a storekeeper at the power station is not felt to be justified, the stock can be placed under the jurisdiction of the storekeeper at the shops, who should have help enough so that he can have one of his assistants spend part time at the power station to keep the stock in order and accounted for. Perhaps the care of the power station tools and the stock could be combined, and the employment of a man thus justified.

A system of placing on the larger items in stock the description and cost price of the article, either by affixing suitable tags or by the use of paint, would go a long way to insure the correct pricing and accounting for this material when it is used or when an annual inventory has to be taken.

Materials Used for Overhead Line Repairs

Here we will have such materials as poles, crossarms, wire, insulators, ears, trolley frogs, and similar materials for telephone and signal repairs. This work will usually be in charge of a line foreman with one or more crews or gangs and assistant foremen working under him. There will be work cars equipped with working stocks of materials and tools, and the linemen must have headquarters of some sort at which to assemble and start out on their work. A small workshop may also be provided. From this place they must take the materials needed in the day's work, and at the close of the day bring back material not used, also second-hand material and scrap removed from the line.

Often some outlying carhouse, not fully utilized by the transportation department, or some unused power station, will be available for a lineman's headquarters, shop and material storage plant. When such a course is followed, it removes the materials from the care and control of the storekeeper and places them under the lineman. This is open to serious objections from the standpoint of accounting, orderliness and safeguarding of the stock. The storekeeper is out of touch and can control neither the upkeep of the stock nor the accounting. Rather than follow such a practice, sacrifices should be made if necessary, to the end that if it is possible and not prohibitive as to expense, the lineman's headquarters can be adjacent to or near the main shops and the main store and the storekeeper retain full control of the working stock required and the second-hand material and scrap returned. The working stock would then be limited to the work or line cars, which would be replenished direct from the storeroom on starting out in the morning.

A similar plan to that suggested for the outlying carhouse can be followed to control the working stock. It will be necessary, however, for the foreman to maintain a daily record of the material used and turn in a requisition for charging out purposes to the storekeeper

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daily. If line poles are received and handled by linemen at points other than the storeyard at the storeroom, a careful receiving record must be returned to the storekeeper daily, and the storekeeper should arrange a monthly inventory of poles to keep this rather large item correctly.

If it is not possible to bring about the desired arrangemen whereby the line foreman's headquarters are situated near the main store, and an independent and separate storage place has to be maintained, the best alternative would seem to be to place the storekeeper in charge of the stockroom, and the keeping of the stock replenished and in order. He should then have enough help so that an assistant can be on duty mornings when the workmen replenish their car and at night when they return, to learn what their plans are for the following day and what material will be required. This assistant can also take charge of surplus secondhand material and scrap. When he is not at the stockroom, it should be kept locked and inaccessible to the workmen.

Materials Used for Repairs to Track

Material required for use on the track is different, in that it is large, heavy to handle, and only to a small extent capable of being stored in the storehouse. Track bolts and track spikes may be kept in the storehouse, but usually will be issued by the keg in unbroken packages. Rail braces, tie plates, track bonds and bonding cable, and a limited number of other items can be kept by the storekeeper with his regular stock, but as a rule the rail, the ties and the special work will have to be handled physically by the roadmaster's forces and stored according to his ideas.

The most satisfactory accounting would seem to be in the form of a daily requisition to the storekeeper made by the track foreman or the roadmaster for the materials used each day, and it will be necessary to have frequent check-up inventories taken if correctness is to be obtained. Special work should have each piece painted (and this painting renewed before it becomes obliterated) with a designated "lot" number, and the description should be a matter of record in the store, so that when such material is used or inventoried the lot number will positively identify the material and the cost price.

Facilities are needed for considerable quantities of bulky materials at certain times or seasons, such as sand for stocking cars for sanding track, and track salt, which is used by the carload lot for salting switches by some roads during snowstorms and in winter. Some care needs to be given to the arrangement of this material for accounting and inventory purposes, so that an inspection of it would at any time determine the quantity on hand without handling it.

Care and Accounting for Scrap

It is most important to give the best attention to scrap and salvaged materials, both from the point of view of possible further use and of recovering in cash for scrap sold as much as possible of the original cost. In the case of a trolley road, the large amount of scrap brass, copper and composition, which has in its pound value a very large per cent of its first cost, makes this especially important. Such metals enter into the composition of armature and field coils, trolley wheels, armature and journal bearings, motors, controllers, compressors, car trimmings, trolley wire and feeders and transmission wire, track bonds and bonding cable, pipe and fittings, and power station electrical machinery, and the value in the aggregate in the course of a year runs up into a large sum of money.

This scrap material should be safeguarded almost as carefully as cash on account of its easy convertibility into cash. A misappropriation is not easily detected, and every practicable means should be taken to safeguard it and to account for it. So far as practicable, a rule should be enforced requiring an old article to be returned to the storekeeper when a new one is drawn from stores. When this is not practicable a good practice is to establish standard scrap boxes around the shops, carhouses, etc., which are always kept locked and in the top of which there is an opening large enough to drop pieces not too large in size, which when once dropped into the box cannot be removed except by the storekeeper. This keeps the smaller scrap out of sight and lessens the temptation to misappropriation.

The storeroom space should also include a scrap room or inclosure in which this class of scrap can be put as it accumulates and where it can be placed in shape for the best market. As fast as it is put into marketable condition by being made clean and free from other material and of suitable size, it is well to barrel it and paint the gross, tare and net weights upon the barrel and report it for sale in this condition. This tends to lessen any opportunity for frauds or connivance between employees and junk men. A copy of these reports of scrap for sale should be sent to the auditor, and his men should check up the material at the storehouses from time to time after it is reported and before it is sold, verifying the weights. From time to time a complete audit of the sales orders issued for the sale of scrap and the shipments of it should be made.

A check should be made from time to time by the accounting department of the weights of scrap of different kinds, as compared with the weight of new material of the same kind purchased, as there should not be too great a disproportion between the two. To illustrate, if a company is going to renew a few miles of trolley wire, it is self-evident that the same number of miles is to be taken down, the larger part of which will be scrapped. The approximate weight of this is determinable in advance, and a system should be arranged whereby the storekeeper will know what he should receive for this scrap. He should then report if it is not received, and the accounting department should also have a system of checking this up.

The scrap accounts are generally based upon estimates, and it is very difficult to estimate such weights closely and correctly. If the more valuable scrap is handled carefully as suggested, it can be weighed as it accumulates and estimates be eliminated. The accounting will then be more nearly correct. If the practice is formed of making out credit requisitions for scrap material when it is removed from equipment, line and track, and scrap accounts are based on these requisitions, accounts will be more correctly maintained than if not.

Importance of Correct Naming and Identification of Material

One of the easiest ways in which wrong accounting for materials may occur is in applying an incorrect price to the article on the requisition slip when the

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material is charged out and also on the inventory when it is taken out of store. It is quite feasible to maintain a card or loose-leaf stock record for each different item of material carried in stock. This record should show the prices and quantities received and the quantities issued, thus maintaining a running inventory. Many roads do this, and careful scrutiny of these cards permits of the application of the correct price or of following a system of average prices. These cards are of great assistance in keeping track of stock and guarding against errors in accounting for it, but with the vast amount of detail work in a storekeeper's office and with the class of help usually employed, it is impracticable to check the work on these cards to any very considerable extent and many errors creep in. On account of this, it is not a safe practice to rely wholly upon these cards as a source of information from which to make orders for replenishment of stock, and if this is done, serious and costly errors will result.

Another very good plan is to give each item of material a designating number, which is posted at the bin and placed upon the requisition when the stock is issued. This helps to keep the pricing right in the office, and many roads follow such a practice. The writer would advocate going a step further than this, and follow the department store idea of putting the price on the material itself, so that the requisition may be priced when the material is issued. This would save a large amount of clerical work in the office in the daily accounting work, would much facilitate the taking of inventories and, it is believed, would tend to reduce errors in pricing and accounting. While the writer is not aware of any railways that follow this practice, he is by no means convinced that such a plan is impracticable. Most absurd mistakes are often made in pricing by the clerks in the office who are unfamiliar with the material itself, mistakes which the storeroom man himself who knows the material would not make if it devolved upon him to price the requisition.

Accounting at Local or General Offices

Where is it the most advantageous to carry on the detailed store accounting work, in the office of the local storekeeper, or in the general accounting offices of the company? Something can be said for each side of this question. By assembling the work at some central point and having it done by accountants, making use of modern office appliances, it seems reasonable to believe that more clerks can be eliminated at the local storekeeper's office than would need to be added at the central office, and the work would have better accounting supervision than would be given at the local store and therefore not so many errors would be made. As against this probable saving in payroll needs to be considered the additional office space for workers and for files at the central point and what the same would cost. The storekeeper, being relieved of this accounting work, can give more time and better service in the care and upkeep of stock and in serving the various departments, and probably could better the work done by those departments, though this improvement would not be visible and could not be stated in dollars and cents.

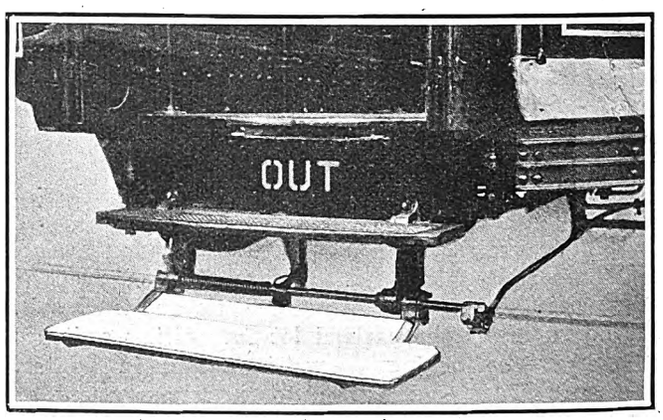
On the other hand, there are difficulties in identifying and pricing the materials when the work is done at points distant from those where the material is located, and questions cannot conveniently be asked of the men who handle and use the material. These objections might be overcome by having the storekeeper price the requisitions. Another objection that might be stated is that when accounting is done at the store and statements prepared there, the storekeeper can keep in better touch with the value of the material carried and consumed in the various classes, and this is quite important in efficiently conducting a store.

Statements made in the general office are not likely to be available for the storekeeper's information as soon after the period is over as if made in his own office. Adjustments will be made without the storekeeper's knowledge, and statements when received are sometimes not understood and often felt by him to be incorrect and unreliable. The storekeeper will not be in a position to answer many questions likely to be asked by local officials of the other departments, who will be uninformed about costs of work done or material used on certain jobs. It might be, however, that these objections could be overcome by sending back all detailed working papers and requisitions for the files of the local store after the accounts for the month had been stated.

Of course, when the accounting is done locally it would have to be under good supervision, and frequent test checks should be made by the traveling members of the auditor's staff. Just as the traveling auditors are sent out at intervals to check up the cashier who handles the company's cash receipts, so too they should visit the storekeepers and check up their accounting for the materials intrusted to their care.

White Steps Reduce Accident Hazard

FOR the convenience of boarding and alighting passengers, the Altoona & Logan Valley Electric Railway, Altoona, Pa., undertook some time ago to install double folding steps on its high interurban cars in place of the single steps formerly used. This was



The Lower Step Is Painted White to Attract the Attention of the Passenger to the Double Step

described in ELECTRIC RAILWAY JOURNAL for Oct. 18. After this had been done, however, it was found that some confusion resulted, since some cars in this district had double steps and other cars had single steps. These cars are of steel and there was, therefore, no convenient method of installing a step light. In order, therefore, to attract the attention of the passenger to the two steps on the interurban car, the railway has painted the lower steps white. A Kass tread of pressed steel is used. This raises the foot of the boarding or alighting passenger off of the white paint, which retains its color longer than would be the case if the passengers stepped on the painted surface.

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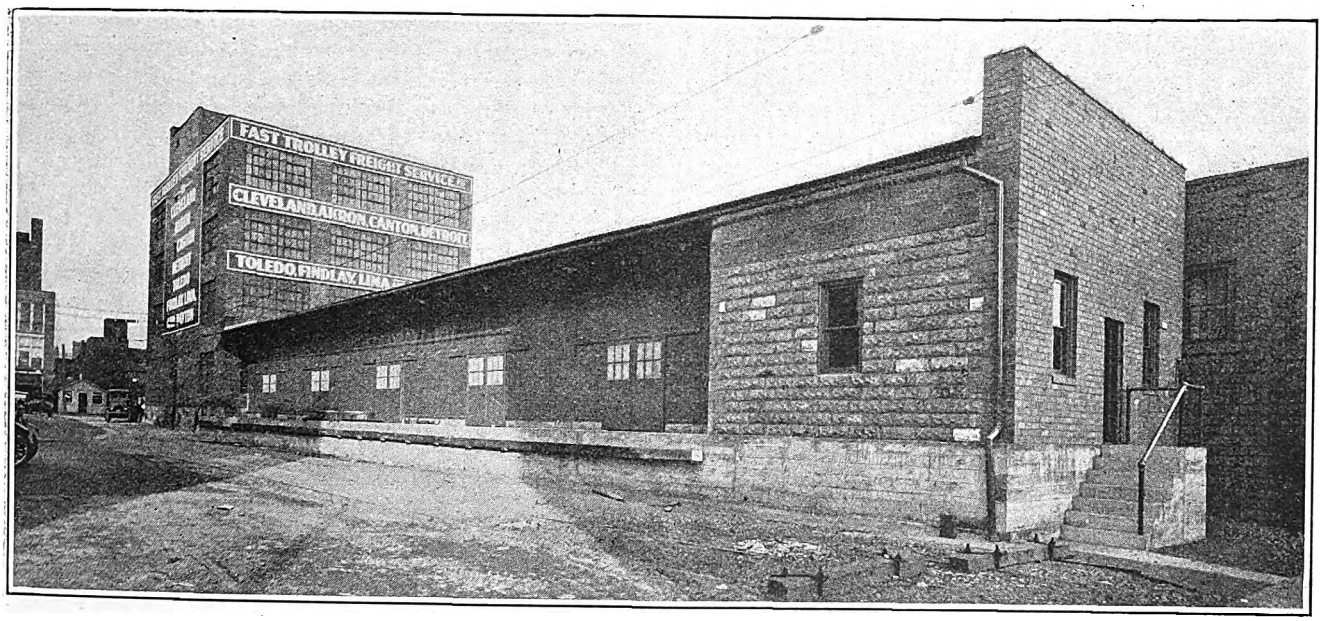
P-O Builds New Freight Terminal

Double-Track Yard with Freight House, Loading Platform and Team Area Is Located in Business District of Youngstown—Facilities Are Provided to Handle Double the Present Business—Connections with Electric Railways in Michigan and Ohio Increase Scope of Pennsylvania-Ohio Service

By R. M. Graham
Manager of Railways Pennsylvania-Ohio Electric Company



Modern, Fireproof Freight Terminal Is Located in Heart of Youngstown, Serving Conveniently the Retail and Wholesale Business Districts

MODERN freight-handling facilities have been provided at Youngstown, Ohio, by the Pennsylvania-Ohio Electric Company, in a new freight terminal house and yard. On Nov. 3, 1924, the freight department of the interurban line was moved into its new quarters, which for some time previous had been under construction. The outstanding feature of this new development is the central location of the terminal. It is less than three short blocks from the central public square of Youngstown. Furthermore, it is situated in the heart of the retail and wholesale business section of the city. Notwithstanding this central location it is easily accessible to both trucks and cars.

The terminal property extends entirely through the block from Boardman Street to Front Street and has a width of approximately 100 ft. Since these streets are important arteries of the city, the terminal is readily accessible from all directions. From the standpoint of the railway operation it is most convenient. A spur track from Boardman Street enters directly into the yard. The company's main storeroom is readily accessible, as is also the office building, located on adjacent property.

In this desirable location the company has built a double-track freight yard with a reinforced-concrete platform and fireproof warehouse along one side and a wide teaming area along the other side. This area is used by trucks delivering and calling for shipments. To facilitate further the handling of freight, all traffic into and out of the terminal is on a one-way basis. The entrance is from Boardman Street and the exit into Front Street. This prevents congestion and confusion and reduces the time the trucks and teams are at the terminal, which is an important consideration for shippers and receivers.

Reinforced concrete is used in the construction of the platform. It is of the proper height for unloading freight cars and for handling shipments to and from trucks. To the rear of the platform, which has a depth of approximately 10 ft., is the freight warehouse. This is a single-story shed, extending from the rear of a four-story building on Boardman Street to the freight office on Front Street. It is of fireproof construction, having sheet-steel walls and roof, the product of the Truscon Steel Company at Youngstown. The offices of the freight agent are at the Front Street end of the terminal, in a brick and stone extension of the warehouse. This location is convenient for the handling of bills of lading as the trucks are ready to leave.

Extensive Freight Connections

The main freight business consists of through shipments over connecting lines from and to Cleveland, Toledo, Akron, Canton, Detroit, Findlay, Lima and other Ohio and Michigan points. Practically all this freight is sent through at night on trail cars. Three or four-car trains are brought into the terminal at night and their contents distributed throughout the day. During the day, trailers are loaded preparatory to being removed the following night. Over-night service is given to Akron, Canton and Cleveland and intermediate points. Forty-eight hour service is given to all other points reached by a connecting line.

In 1918 connections were made with the Cleveland,

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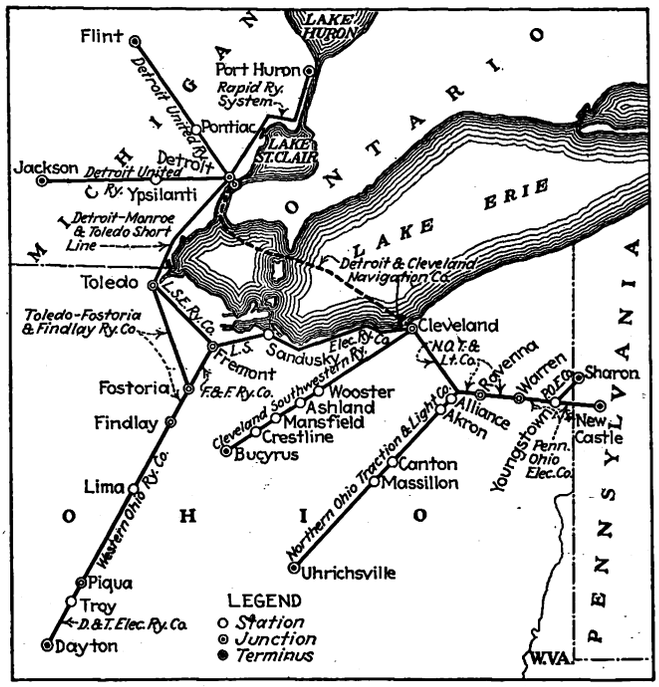


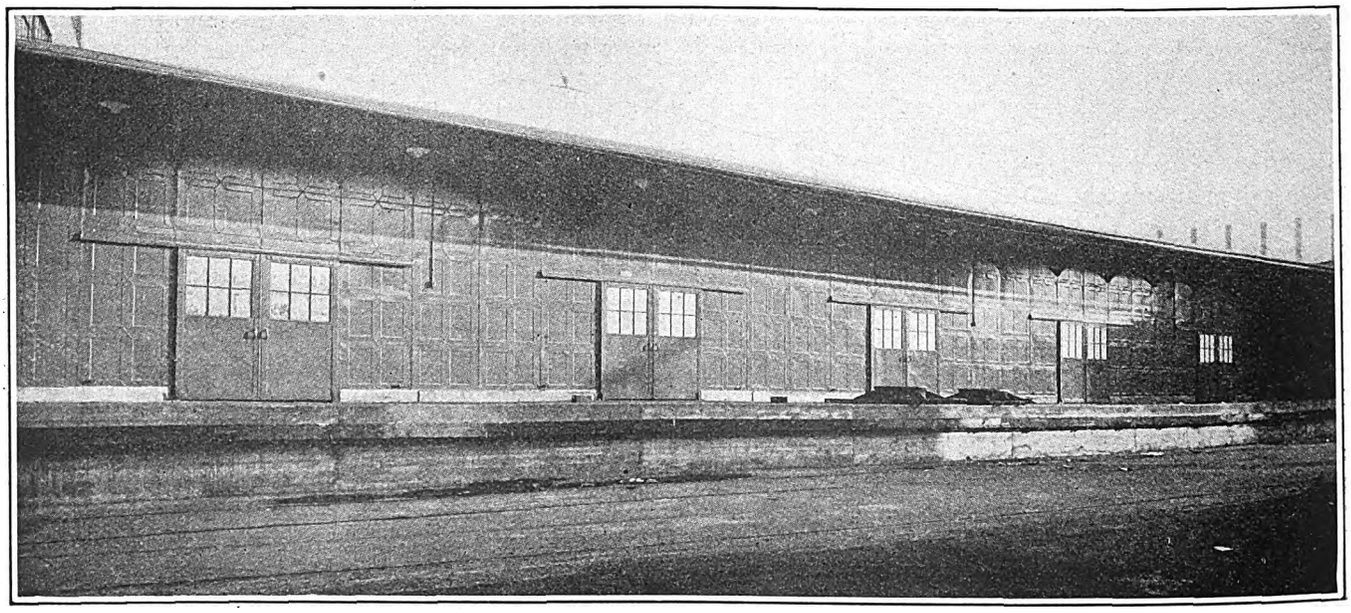
Many Important Freight Centers Are Reached by P-O System
Freight service offered by the Pennsylvania-Ohio System and connecting lines, includes principle cities in Ohio, Michigan and Pennsylvania. Copies of this map were used to advertise the service.

Alliance & Mahoney Valley Railway at Warren, Ohio, but the area served was small and the business handled did not show much increase. Following this, however, connection was made with the Northern Ohio Traction & Light Company, whose lines reached Akron, Cleveland, Urichsville, Canton and other important towns. The business received at first was small, but the fast over-night service to and from these points was soon appreciated by shippers and receivers of freight in Youngstown. This resulted in large freight trains being handled daily by this joint operation.

Still striving to increase business, other connections were sought and arrangements made for the handling of interline freight to and from the Detroit & Cleveland Navigation Company in order to reach Detroit. This was highly desirable in view of the fact that Youngstown produces many articles used in the automobile industry. Connections were then made with the Lake Shore Electric Railway, with lines extending from Cleveland to Sandusky, Fremont and Toledo. More recently, connections have been made with the Western Ohio Railway and the Dayton & Troy Electric Railway, which connects with the Western Ohio and operates into Dayton. Arrangements are now being made to connect with electric lines serving Detroit, Flint and Jackson, Michigan and points southwest of Cleveland. The accompanying map illustrates the scope of the freight service given through the connecting lines.

Dependability is the watchword of the Pennsylvania-Ohio system in handling freight shipments. The completion of the new terminal has overcome the handicap of lack of facilities under which the company previously labored. It is thought that the new facilities will permit the volume of freight to be doubled. This fast service has been recognized as a real asset to the merchants and industrial plants of Youngstown, as it permits of their carrying small stock, knowing that they can depend upon fast electric freight to handle their consignments without delay. The effort is being made not only to reduce complaints to a minimum, but to make the carrying and delivery of such freight as is intrusted to the company so completely satisfactory that it will more than fulfill whatever expectations may have existed in the minds of the customers.

A noteworthy feature of the new freight terminal is the extraordinary illuminating effect which the company has worked out in connection with it. Large painted signs on the east side of the Boardman Street building are illuminated with a battery of five lights installed on the roof of the office building across the areaway from it. The signs on the south side of the building are illuminated by four projectors installed on the roof of the freight shed. Similar signs on the west side of the building are illuminated by four Western Electric "X"-ray projectors installed on poles. The prominence of the building and its situation is such that it can very readily be seen from a large portion of the city. This extraordinary illumination of the building and its signs renders it a conspicuous feature of the landscape. In addition to these signs, the company also makes general use of billboards in advertising this convenient and attractive service.



The Loading Platform Extends the Length of the Fireproof Sheet-Metal Warehouse and Is Served by a Double-Team Track

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Electric Derail Protects Bridge Crossing

Derail Controlled by Approach of Car Replaces Hand-Operated Type on Chicago Surface Lines—Operation Interlocked with Movement of Bridge—Experimental Installation to Be Forerunner of Others

AN ELECTRICALLY operated track derail, controlled by the approach of a car and interlocked with the movement of the bridge, has been installed recently by the Chicago Surface Lines on the southbound track at the Wells Street bridge approach. This experimental installation replaces a hand-operated derail formerly in use at this point. If the new type of derail stands up under the severe service, the company plans to replace five other hand-operated derails with the electric type.

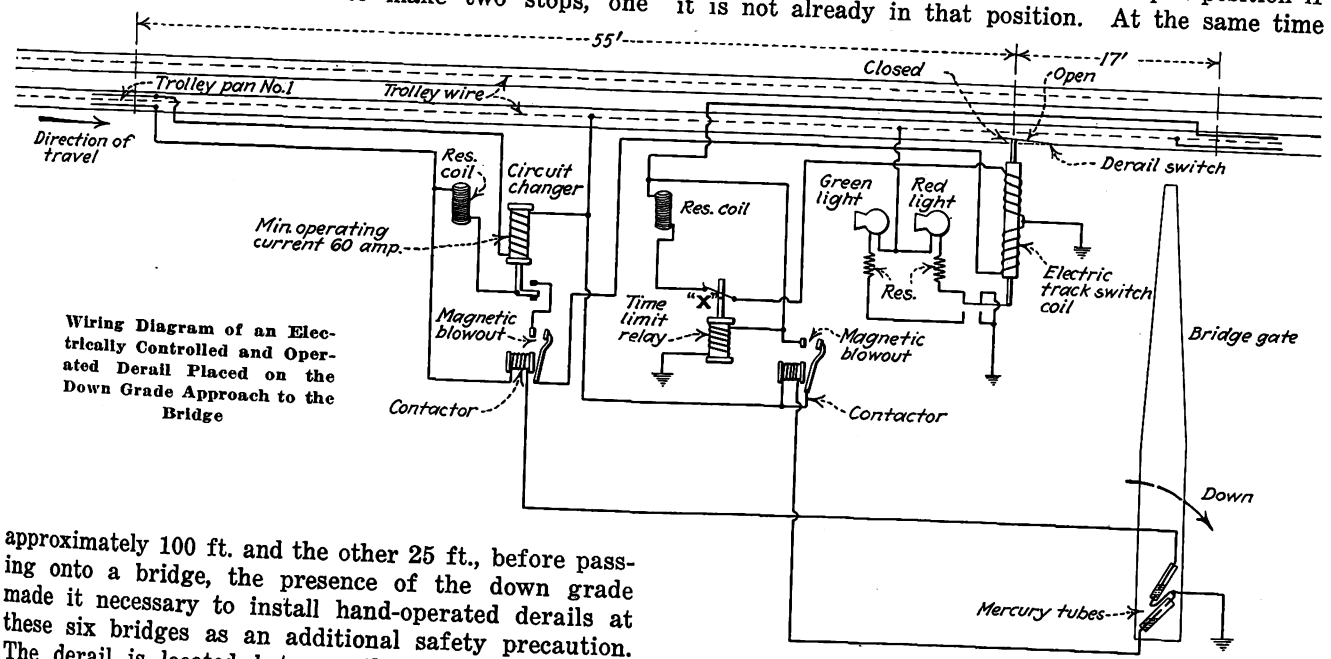
Of the many bridge approaches on the Surface Lines, only six are on a down grade. Although a city ordinance requires all cars to make two stops, one approximately 100 ft. and the other 25 ft., before passing onto a bridge, the presence of the down grade made it necessary to install hand-operated derails at these six bridges as an additional safety precaution. The derail is located between the two points where stops are required. It was necessary to have a switchman on the job 16 hours of the day to throw the hand derail in front of each car. This required the services of two men for each derail. During the remaining 8 hours of the night, the conductor on each passing car threw the derail. The electric derail dispenses with the services of the two flagmen and also eliminates the hazard of having the conductor cross the street at night through the vehicular traffic.

As the company was unable to obtain the desired type of derail complete, it was necessary to utilize available electric track switch equipment. A solenoid operated switchpoint is used with control similar to that employed in track switches. One two-plate contactor is located 55 ft. in front of the derail. A second trolley pan is located 17 ft. beyond the derail. The first is electrically connected to the solenoid of the derail so that the motorman must pass with power on, in order to throw the derail to the straight track position. When the car passes the second pan, whether with power on or off, the derail is thrown to open position.

Two signal lamps the mounted on the elevated structure overhead near the derail. Each signal consists of a lamp box with shaded lens, one green and the other red. When the derail is open the signal shows red, this being the normal position of the apparatus before the car passes the first pan. When the switch is thrown to straight track position, the green signal is lighted.

By interlocking the action of the derail with the movement of the crossing gate protecting the entrance to the bridge, it is possible to prevent a car from going on the bridge when it is open or about to open. This is accomplished by connecting the switch control circuit through two mercury contact tubes mounted on the gate.

As will be seen from the accompanying wiring diagram, one of these tubes is so mounted that when the gate is raised, contact is made through this mercury tube, allowing the derail to be operated by means of the two trolley pans. However, when the gate is lowered the other mercury tube closes the contact, which throws the derail into the open position if it is not already in that position. At the same time the contact in the first mercury tube is opened, preventing the operation of the derail by the first trolley pan. As it is necessary for the bridge tender to lower the crossing gate before he can raise the bridge, the derail is thrown into the open position some little time before the bridge is raised. This requires an approaching car to stop before the bridge actually begins to raise and avoids any possibility of accident.



Wiring Diagram of an Electrically Controlled and Operated Derail Placed on the Down Grade Approach to the Bridge

The locations of the pans, signals and derail are such that the operation of the derail fits in with the transportation department's operating rules. The motorman stops his car approximately 125 ft. before the bridge at the top of the down grade. Just beyond this point is located the first trolley pan which must be passed with the power on. The motorman notes the change in position of the derail by watching the switchpoint or the signal light. After passing the derail and the second pan, it is necessary for the motorman to bring his car to a full stop before going onto the bridge. Thus the whole operation makes the motorman watchful and careful in approaching the bridge.

A few changes were made in the standard switch equipment in order to adapt it for this special installa-

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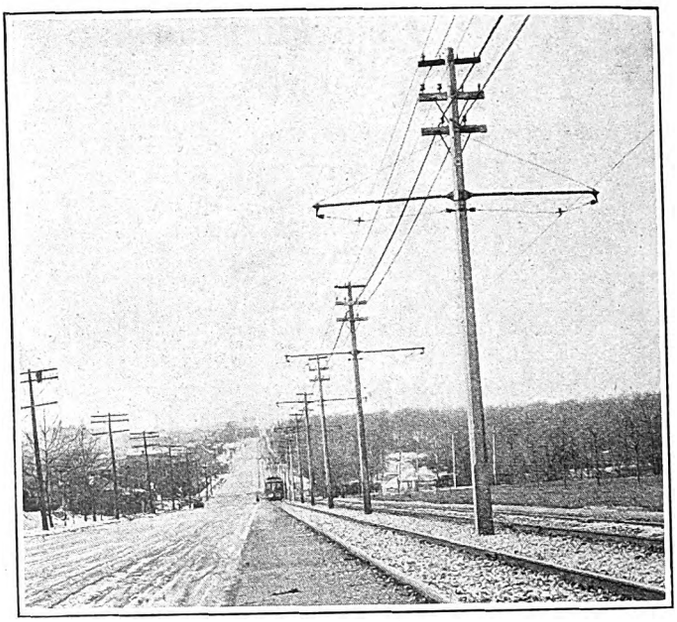
tion. Two magnetic blowout contactors are used to take the heavy arc in the control switchbox which is located on an adjacent trolley pole. A new type of solenoid track switch made by the Cheatham Electric Switching Device Company is used. The ordinary operation is reversed, as this switch is set for straight track by applying power. A time-limit relay protects the electrical apparatus should a car stop with the trolley wheel on the pan. This relay is set for 5 seconds and is brought into play if a car is blocked by the bridge. However, the relay is reset automatically when the car clears the pan.

This initial installation of bridge protection has been in operation since Sept. 21. For the month of October, the derail was thrown approximately 30,000 times without a failure.



Concrete Poles of This Type Are Being Installed at the Rate of Approximately 100 per Year

Railway Makes Concrete Poles in St. Louis

Reinforcement Has Been Arranged to Provide Adequate Strength Where the Strain Is Greatest and Eliminate Excess Metal in Other Places—Steel Hoops Hold Reinforcement in Place

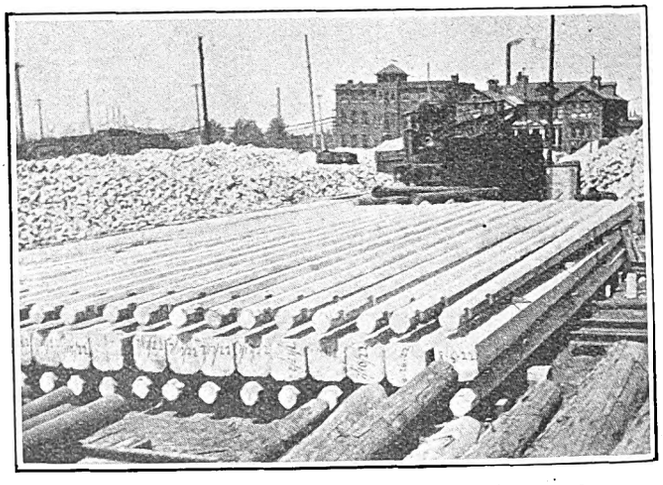
BY C. L. HAWKINS
Engineer of Way and Structures
United Railways of St. Louis

THE United Railways of St. Louis for the last four years has been using reinforced concrete poles to replace defective wooden poles. At present approximately 100 concrete poles are placed per year, although a total of more than 1,000 have been installed on the system.

The success of the concrete pole depends, to a great extent, upon the position of the reinforcing bars and the care taken in placing them. An accompanying illustration shows the arrangement adopted by this company. Steel reinforcement consisted of deformed bars which are rerolled by the Laclede Company from rail steel. Corner bars are of $\frac{5}{8}$-in. square section, while the intermediate bars are $\frac{1}{2}$ in. square. As the greatest bending moment occurs between 4 ft. and 14 ft. from the bottom of the pole, three intermediate reinforcing bars have been placed on each side of the pole in this area. The reinforcing rods are held in place by $\frac{1}{4}$-in. round steel hoops. In the section where the greatest strain comes these are spaced 6 in. apart, but elsewhere they are 12 in. apart.

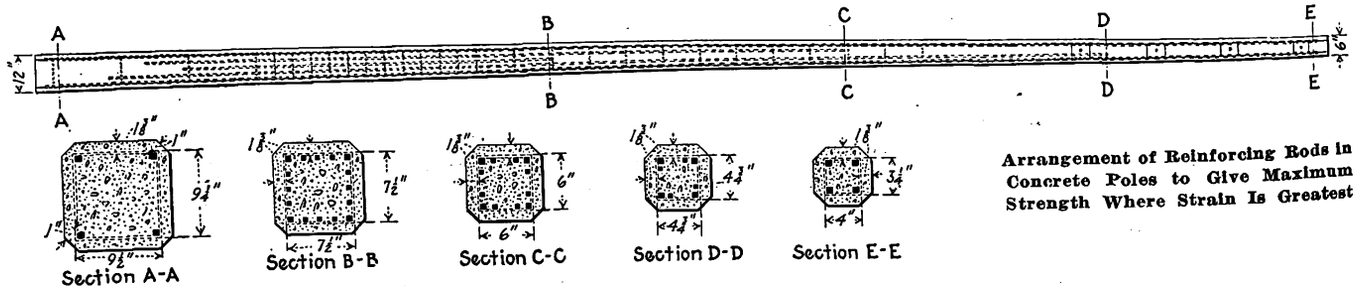
The standard pole is 35 ft. long with a base 12 in. square and a top 6 in. square. The corners are beveled, but sufficient concrete has been left to insure a thickness of 1 in. between the outside edge and the nearest of the reinforcing rods. Elsewhere the rods are approximately $1\frac{3}{8}$ in. from the outside.

The concrete mixture used is 1:1½:3. Gravel graded down from ½ in. size is used in the aggregate. It is thought that a coarse concrete would be bad for this purpose, as it would permit the reinforcing rods to rust. Concrete is poured into the mold fairly dry, in order to obtain the maximum possible strength in compression. The care taken in the manufacture and handling has almost eliminated defective poles.



Method of Storing Concrete Poles in the Yard of the United Railways of St. Louis

Driving one of the buses is considered the best job in London for the unskilled workman. A 6-day week minimum is guaranteed and the earnings are about £5 a week for a driver and £4 for a conductor, with an average of about £1 a week extra for overtime.



Arrangement of Reinforcing Rods in Concrete Poles to Give Maximum Strength Where Strain Is Greatest

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Automatic Doors Relieve Jim Crow Problem

Several Months Experience in Dallas with 20 Cars Equipped with Rear-End Automatic-Exit Doors Has Led to Extension of Their Use

BY RICHARD MERIWETHER
Vice-President and General Manager Dallas Railway

DURING the late spring of 1924 the Dallas Railway started to equip 20 double-truck cars for one-man operation by installing safety devices, pneumatic door engines and a treadle-operated rear-exit door. Six of these cars were placed in service in September, on the Munger-Highland Park line, and by Oct. 1 the line was completely equipped with 20 of these cars. This route is 8 miles in length and has a 5-minute headway during the peak hours and a 10-minute headway during the remainder of the day.

The distinctive feature of the cars is the rear-exit door, which is controlled by a treadle set into the platform floor in front of the door. When a passenger steps on the treadle the door opens. It then closes automatically as soon as the step is clear, unless in the meantime another passenger has stepped upon the treadle. The mechanism is interlocked in such a way that the door will not open until the brakes are fully applied, and the car cannot start until all doors are closed.

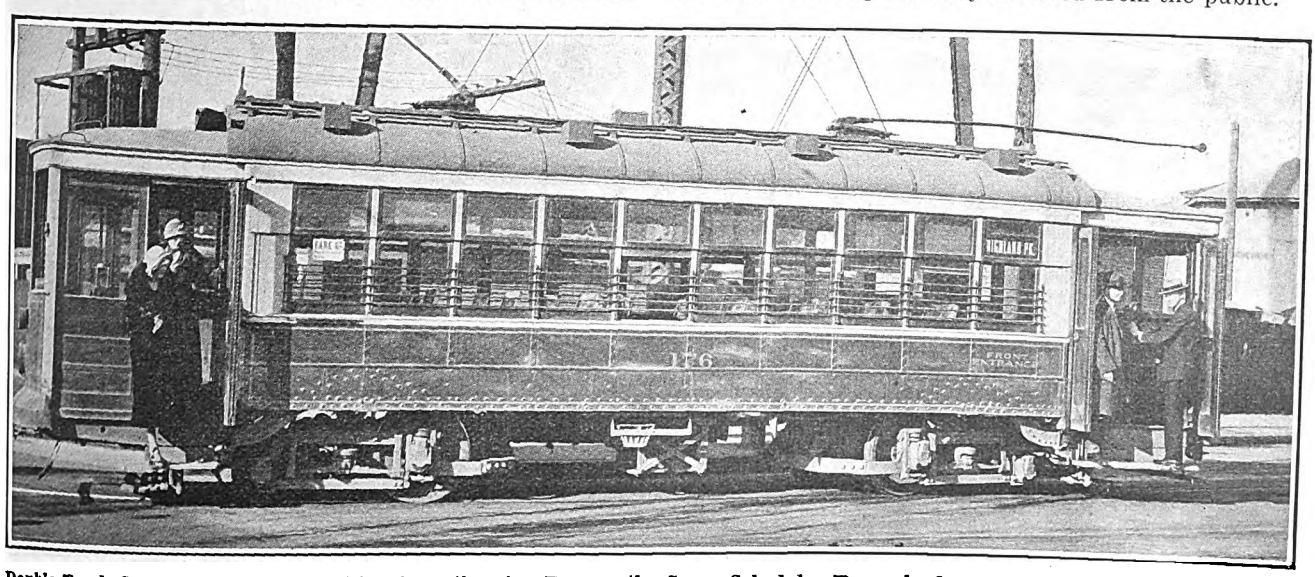
This automatic rear-exit door was installed because passengers objected to one-man operation on account of having to crowd through the aisles to the front exit. Dallas being a Southern city, this condition was particularly objectionable. The "Jim Crow" law is in effect here, and requires the negroes (who constitute some 20 per cent of the population) to be seated in the rear of the car. White passengers objected strenuously to the negroes crowding through the aisle to leave the car at the front, and the rear-exit door offered the means of completely eliminating the cause of complaint. Furthermore, it is a great convenience to white passengers, who may also leave by the rear door when the front end of the car is crowded.

Service has been materially speeded up by the automatic rear-exit one-man car; in fact, the cars being used in Dallas have demonstrated that they can handle the traffic quite as rapidly as two-man cars. The schedule on the line now being operated with these cars is the same as when two-man cars were in use. Another feature which enhances the value of this automatic door arrangement is a key valve, so located that the rear door may be opened with a key by street fare collectors stationed at the most important downtown corners.

When the Last Alighting Passenger Clears the Step the Rear Exit Door Automatically Closes

ANSWERS ONE-MAN CAR CRITICISM

The Dallas Railway is a pioneer in the development of the rear-door treadle exit for one-man car operation. The arrangement has proved so satisfactory that the company is proceeding to change over 20 additional double-truck cars in the same manner as the first lot, and hopes to have, within a reasonable period, not less than 100 cars equipped with the rear-door treadle exit. The arrangement has completely answered all the adverse criticisms from patrons of the Dallas Railway on one-man car operation, and the management is elated at the reception they received from the public.



Double-Truck Cars Converted for One-Man Operation Are Run on the Same Schedules Formerly Operated with Two Men. Automatic Rear-Exit Door Is Interlocked So Car Cannot Be Started Until Doors Are Closed

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Association News & Discussions

The Business Paper of the Future*

What It Needs of Its Industry—What It Can Do for Its Industry—Assistance Which It Can Give in Reducing Production Waste and Distribution Waste

BY JAMES H. MCGRAW
President McGraw-Hill Company, Inc.

BEFORE launching into consideration of the future, it would be well if we agree upon the fundamental characteristics of the business paper.

It is, first, a merchant of ideas. Like unto the great merchants, like Marshall Field and Wanamaker and Tiffany, it delves into the far corners of this country and of the world for the best merchandise—the merchandise, in this case, of ideas—assembles it in one place and displays it attractively for its customers. While delving into the corners of its field it shares in the counsels of the mighty, and in the noon-time exchanges of experience of artisans, mechanics, salesmen and saleswomen. It becomes close brother of all who work in industry and trade.

At the same time its obligation is to the whole group rather than to individuals. It sits, therefore, as a judge. Business passes in review before it. It is of the industry but not immersed in its details. It is judge, counselor, sympathetic critic. Its duty is to advise, to warn, to encourage, to applaud.

Sitting on the side lines as judge and counselor, it becomes co-ordinator as well. With responsibility to the whole group, it brings into unity of action those working at cross-purposes. Its function is to make all forces in a branch of business bear in the same direction—and that direction the right one. The business paper, therefore, is information bureau, teacher, friend, philosopher and guide, of industry and trade.

The question before us now is this: What can the business paper accomplish in the future? What demands will come upon it and how will it meet them?

To speak with absolute certainty about the future is given to no man. We can only estimate the probable continuation of trends that are discernible today. To tell what the business paper of the future will be, we must seek the trends in business that are so fundamental that they are likely to persist. Are there such trends? And if there are, whither do they lead?

In the first place, business will continue to enjoy, for one if not for more generations, the marvelous growth of the last 50 years. There are no signs of loss of virility in American industry and trade; rather there is increase in capacity, initiative, courage and energy. There is not such serious diminution of natural resources as to cause an early slowing up. In consequence, business will become more complex, its problems larger and more difficult.

In the second place, the American people, having tasted of high standards of living, will demand still higher standards, requiring the constant increase in the purchasing power of the wage dollar. This will require greater efficiency in industry and trade—which means the elimination of waste, and will, in the race for public favor, make the competition of the future more severe than that of the past.

What influence have these trends upon the business paper?

WEIGHTIER PROBLEMS

It should be apparent that a business of greater volume and greater complexity, carried on in larger units and by larger organizations, will confront business men with problems weightier and more difficult than in the past. They will need for their solution more knowledge, wider experience, keener analysis, more reliable conclusions, more courageous plans, more decisive and effective execution. If the business paper is to play worthily its part it will have to deepen the wisdom, broaden the experience and strengthen the courage of its staff that it may bring to these business men knowledge and counsel and warning measuring up to the weightiness of the new problems.

In numbers our larger papers are now well staffed. The need will be not for more men, but for better men; men who can gain the confidence of the big business men of the future, and having gathered the best of the experience of leaders and made it their own, can command the respect and following of the field for whatever of counsel and warning they may give as a result of their judgments.

The second of these trends demands that we shall continue to increase efficiency in business—which means to eliminate waste. Much has been done in this direction, particularly in production. So far have we gone, in fact, that, save for new technical discoveries, further progress in individual effort will be slow. But vast areas of waste elimination remain that can be reclaimed by collective effort, particularly in the field of distribution of goods and commodities.

In this collective effort in waste elimination we have made valiant beginnings. The great technical societies, by their standardization, test and specification work, and the trade associations have eliminated much wasteful practice. The admirable methods and efforts successfully applied in engineering and production need to be extended to every phase of business. It is one of the many contributions that Mr. Hoover has made to our material progress to point out these new areas for collective effort and to do it so dramatically that American business is putting a new emphasis on their study.

In this work, the business paper of the future can play a large part. It has always been a great co-ordinator. No agency has been responsible for the formation of more trade associations and technical societies than business papers, and no agency has done so much to spread a knowledge of their work and to secure acceptance thereof. Efforts of this kind will assume a greater importance in the future.

WASTE IN DISTRIBUTION

Of this area of waste elimination one part—that in distribution—looms up as the largest problem before American business today. The spread between production cost and the price paid by the consumer is far too large. Collective attack, as Mr. Hoover has insisted, alone holds possibility of large results. Wastes in transportation, in inefficient hauling and loading; wastes in deterioration of commodities; wastes in disorderly marketing, with attendant gluts and famines; wastes in too many links in the distribution chain; wastes in bad credits; wastes through the "competition of ignorance," by those who do not know their costs and the fundamentals of the business in which they are engaged; wastes in not knowing the markets in which one can sell economically; wastes in not knowing the buying habits of private and of industrial consumers; wastes in using wrong channels of approach to prospective buyers; wastes in advertising and selling by using appeals that have no power to influence the prospect.

What part can the business paper of the future play in this study of distribution?

Just as large, I answer, as the capacity of its publishers and editors and advertising men. It is in a strategic position. It is the confidant of industrial and trade leaders. Eagerly they will give of their views and experiences, eagerly will they accept help, so long as it be intelligent, stimulating and sound.

I do not mean that the business paper can by itself study the whole problem. It can, however, stimulate and co-ordinate, point out the new fields for investigation and hammer home the discoveries made until they are gen-

*Abstract of address at the annual meeting of the New York Business Publishers' Association, New York, N. Y., Jan. 27, 1925.

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erally accepted and put into effect. It can, too, it must in fact, be itself an authority on selling methods, so far as they touch its own field. How else can it dispose of its own goods—advertising—in the spirit of modern selling, that spirit which is to "service," rather than "sell," the product to the consumer? We must be experts not only in advertising, but in the channels of distribution and sales methods that will be effective for our clients.

Superior Service Demanded

I referred previously to the increase in severity of competition as another of the results of the effort to raise the standards of living. This tightening of competition will create a new hungriness for facts, for data leading to economies, for searching inquiry into the best practice.

I have frequently heard publishers and editors say that they could not hold this or that type of influential subscriber, that the renewal rate in desirable branches of the field was inordinately low. There seemed to be an implication in their tones that the prospective reader was at fault. But the fault lies in ourselves. Why should the reader buy our wares if they are unsound, stale or commonplace? He needs help, but the help must be real. If we will but get to the bottom of the problems of our fields and have the ability to take the leadership in their solution, we shall have no cause to complain of failure to get and hold influential subscribers.

Circulation Work

The same sort of research that I described for the editorial and advertising departments is needed in circulation work, as well. Our inquiry must start with a thorough knowledge of our field. It must proceed to a picking of those who can profitably use our paper, and then to a concentration of selling effort to put these names on our subscription lists. Finally, it must include a thorough survey of the influence of these subscribers, their buying habits, their buying or specifying power, the channels for approaching them and the appeals that are valid.

In other words, hit or miss in circulation will not avail, nor will even the building up of sound circulation. There is needed, as well, thorough knowledge of what that circulation can do for the advertiser.

Our Responsibility to Society

I want, in closing, to leave a thought regarding our broader responsibility. We as business publishers owe our primary responsibility to the business, to the industries and commerce, of America. But eventually our accountability, as well as that of business itself, is to the whole American people. Viewed in this light, the business paper is a great social force. It has ever stood for economic and governmental sanity, but its counsel will be more needed in the future than in the past. Many agencies of information—newspapers, magazines, associations, even some of the colleges—are veering with each erring wind of public fancy. It is all the more important that the business press fight without tiring for economic and governmental soundness. It should stand for enlightened business policy—for fairness to the owners of business, to the employees and to the public. It should urge that business men think rather of their responsibilities than of their rights.

It should above all, stand for the principle of individualism in American life, making the sole reservation that that individualism shall not transgress the rights of others. It is upon this individualism that our social structure rests. If today our people enjoy the highest standards of living of any people on the globe, if they are better fed, better clothed, better housed and have more of the comforts and luxuries of life, it is because of the stimulus afforded by the individual initiative and risk on which our business is founded. A nation committed to individualism will conserve the foundation of liberty on which our government rests.

To stand for principles such as these, to champion them in the interest of the whole people and the integrity of our system of government, is the inestimable privilege and the solemn obligation of the business publisher.

American Association News

Mr. Brush to Address Midyear Meeting

M. C. BRUSH, president of the American International Corporation, has just accepted an invitation to be one of the speakers at the banquet of the Midyear Meeting of the American Electric Railway Association. Acceptance of the invitation by Mr. Brush was gratifying to the association executives because not only is he an old-time electric railway man, but he speaks his mind plainly, as it is hoped all of the Midyear Meeting speakers will do.

Other speakers who have accepted for the meeting include Gen. Guy E. Tripp, J. G. Barry, George E. Hamilton, Peter Witt, S. B. Way and Commissioner John Esch.

President Shannahan has extended invitations to the chairmen and members of public utility commissions, as well as other governmental officials, to attend the meeting, which will be held in Washington Feb. 17. The present indications are that this will be one of the most successful Midyear Meetings in the association's history.

Reservations for hotel rooms and the dinner are coming in fast, association headquarters reports.

The transportation committee, under the direction of E. C. Faber, chairman, has divided the country into sections and every member of the association has received a personal letter from a member of the committee setting forth the attractive features of the Midyear session. Barney Frauenthal and H. J. Kenfield have sent out special folders in the St. Louis and Chicago territories, respectively, boosting the meeting.

Meetings of the manufacturers' committee on co-operation and the directors of state committees on public utility information have been called for Monday, Feb. 16.

New Publicity Material

THE manufacturers' special committee on co-operation of the American Association, of which E. F. Wickwire, vice-president Ohio Brass Company, is chairman, has just opened up a new publicity channel for telling the electric railway story. A special label, or dodger, of the size used in the theatrical business for "sniping" has been prepared and distributed for sticking on freight and express shipments. The idea is based on a conviction of the committee that there isn't half enough reading matter around railway stations and that any label which shows its face around a depot is certain to be read. Therefore this sticker is headed "I'm a Railway Man."

The complete text is as follows:

"I'm a Railway Man. I make electric railway supplies. More than 300,000 of my buddies throughout the United States do the same thing. This package contains some of the supplies I made. A square deal for electric railways means a square deal for us."

The label carries the picture of Bill Ernst, whose face has been on other electric railway publicity material. He is a worker in a manufacturing plant, is good natured, looks genial, and likes his work.

Special Reports Available

THE following special reports have been prepared by the bureau of information and service of the American Electric Railway Association and are available to member companies in good standing upon request:

Bulletin No. 6—Public Utilities Securities Issued in 1924.—A list of the new securities issued in 1924 divided between electric railways and other public utilities showing the type of security, amount issued, maturity date, interest rate and offering price. The list is preceded by a cumulative table comparing the amounts of securities issued in 1924, 1923 and 1922.

Bulletin No. 7—Trend of Trainmen's Wages.—Shows for a large group of companies maximum wage rate; the number of years of service necessary to reach it and the number of trainmen employed for the years 1914 to 1924 inclusive, and the same information as of Feb. 1, 1925.

Bulletin No. 8—Trend of Electric Railway Fares, 1917 to 1924.—This shows the fares in effect in each of the 288 cities having a population of 25,000 or more each year from 1917 to 1924. In addition it shows the average cash rate of fares in these cities in these same years, and the number of cities in which each rate of fare was in effect in each of these years.

Bulletin No. 9—Toll Bridge Rates.—Gives summary of the information obtained in the replies to a circular letter of inquiry addressed to members on the subject of toll bridge charges, and covers charges paid by electric railways for the use of bridges and the schedules of charges for other users of the bridge levied by electric railways owning and operating toll bridges with a statement of the operator's views as to the proper basis of fixing charges on toll bridges.

In addition to the above, supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies (Bulletin No. 10) have been prepared bringing them down to date.

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Maintenance of Equipment

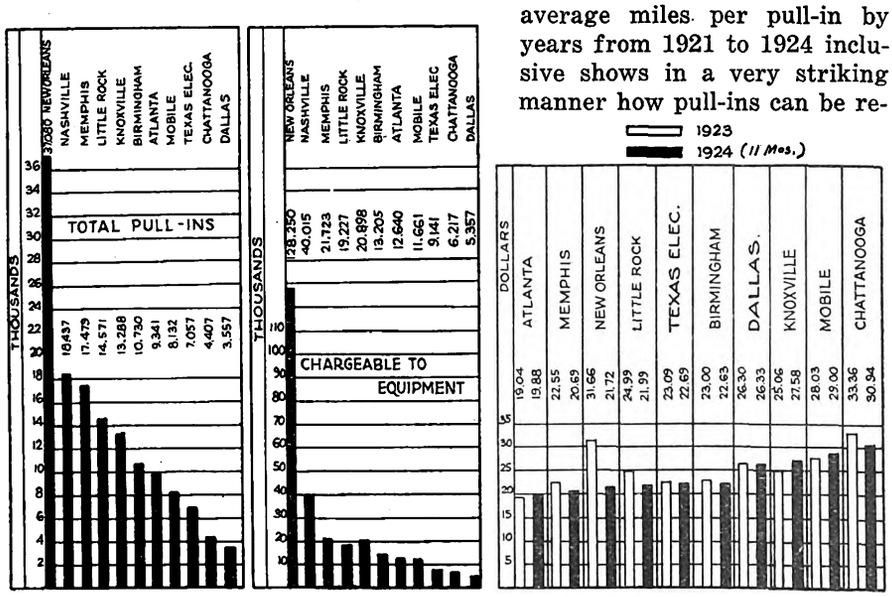
Pull-Ins Reduced on Southern Properties

THE number of cars pulled in during the year 1924 has been reduced materially for the properties comprising the Electric Railway Asociation of Equipment Men, Southern Properties. A record of pull-ins showing the average car-miles for the year up to and including September was published in the ELECTRIC RAILWAY JOURNAL for Oct. 25, 1924. The complete record for the year, now published, shows the average car-miles per pull-in which is chargeable to the carhouse as varying from 5,357 miles in Dallas to 128,250 miles in New Orleans. This is greater than for any previous year. The accompanying illustrations give comparisons of pull-ins and maintenance cost for each property represented in the association.

The statement giving the detailed troubles which have resulted in car pull-ins shows that armatures have been the chief cause of breakdowns. Other equipment parts which have caused high numbers of pull-ins are fields, brushes and holders, motor leads, gears and pinions, controllers, air brakes and brake rigging.

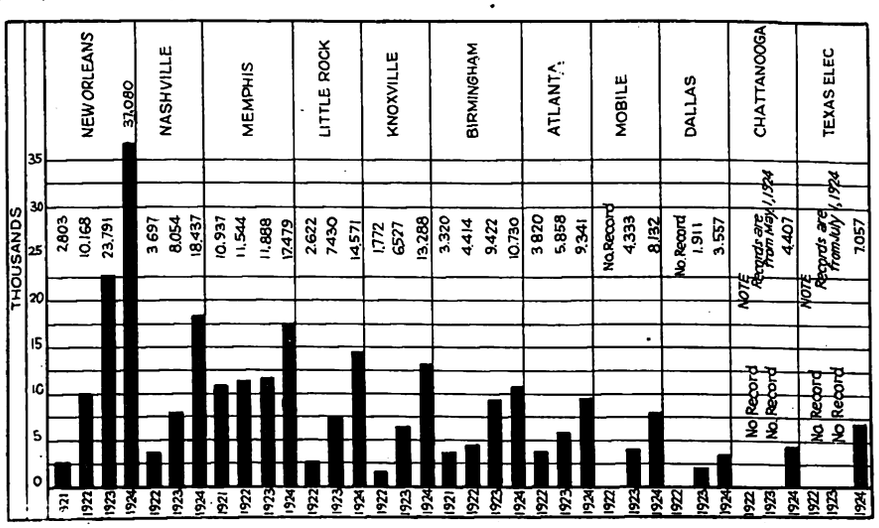
The chart giving comparisons of average miles per pull-in by years from 1921 to 1924 inclusive shows in a very striking manner how pull-ins can be reduced by giving particular attention to the causes. The record of each individual property has been bettered each succeeding year. New Orleans has shown the greatest improvement with an increase from 2,803 miles per pull-in for 1921 to 37,080 miles per pull-in during 1924.

The chart of comparative equipment maintenance cost on a car-mile basis shows that the low figure of 2 cents per car-mile has been obtained in Atlanta, with other properties showing very low costs also. The highest is that of Chattanooga with 3.1 cents per car-mile.



Average Miles per Pull-In and Cost of Equipment Repairs, Southern Properties

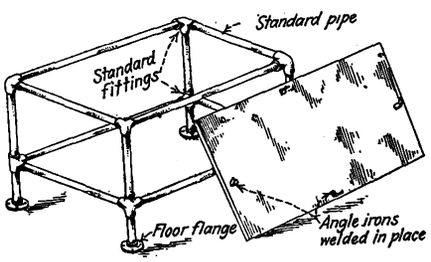
At left, average miles per total pull-in for year 1924; in center, average miles per pull-in chargeable to equipment; at right, comparative maintenance cost of equipment per 1,000 car-miles for year 1923 and 11 months of 1924.



Average Miles per Total Pull-In by Years, 1921 to 1924 Inclusive

Welding Table for Light Work

MUCH of the welding carried on by electric railways in maintenance work is on small parts which may be picked up and carried about by hand. For this class of work a light welding table, which may also be moved about, is particularly convenient. Several railways have made tables by using a framework of steel



This Table, Constructed of Standard Pipe and Pipe Fittings, Facilitates Welding of Light Parts

or of pipe with a solid steel or cast-iron top. The size of such a table, of course, varies with the work to be handled and the space available on different properties. A convenient size is 3x5 ft. An accompanying illustration shows such a table constructed of $1\frac{1}{4}$-in. pipe with standard pipe fittings. On some railways many of the fittings are done away with by welding the pipes together where they join.

For light welding the work may be set on the bench, which is grounded, and the contact will be sufficient to cary the necessary welding current. A vise added to the table

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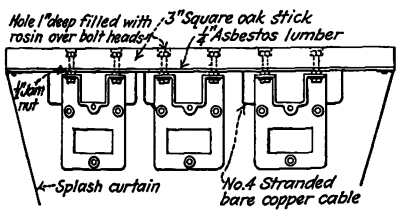
top has been found convenient for holding the piece in proper position during the welding operations and also to form the contact for the welding current. Where it is found inadvisable to have the framework carry the current, a bar with one end connected to ground can be laid across the piece being welded. This will provide sufficient current carrying capacity, provided all scale and rust which might prevent proper contact are removed.

Installing Standard Resistors

STANDARD resistors are being installed in a uniform manner on all cars of the Syracuse division of the New York State Railways when they are taken into the Wolf Street shop for overhauling. The company's standard arrangement consists of three frames of resistors placed in a row on one side of the



Method of Mounting Resistors Adopted as Standard in Syracuse

car, depending on the equipment and style of car. The resistance frames are supported by two 3x3-in. oak blocks running lengthwise of the car. The blocks in turn are fastened by two ½x2-in. iron brackets. Asbestos lumber of ¼ in. thickness is placed over the resistors.

Standard bolts with lock washers are used for fastening the resistance frames to the blocks. The bolt heads are countersunk 1 in. and after the bolts are in place the holes are filled with rosin. Sheet steel splash guards are placed at the ends of the row of resistors to prevent water and slush from striking the grids. The resistance wires as they come from the main cable are covered with ½-in. duraduct, which runs to the asbestos lumber shield. From this shield to the terminals of the grids the wires are bare, so as to prevent any insulation from becoming charred due to overheating of the resistors. The bare wires are thoroughly tinned. An accompanying illustration shows the method of mounting and the splash shields used at either end of the resistor frames.

Bead of Solder Indicates Pole Clearance

By F. C. Lynch
Shop Supervisor Kansas City Railways

IN THE Kansas City shop it is the practice, when soldering the band wire on the armatures, to leave several small beads of solder spaced at intervals around the armature so that when it is put into the motor housing these small beads of solder rub down by contact with the pole pieces.

Their thickness indicates exactly the clearance that remains before the armature will touch the pole pieces. In this way an examination of these beads at any time, even when the armature is in the motor, will indicate quickly whether the bearings are in a condition that is likely to cause the armature to rub in the near future.

New Equipment Available

Improved Switchboard Instruments

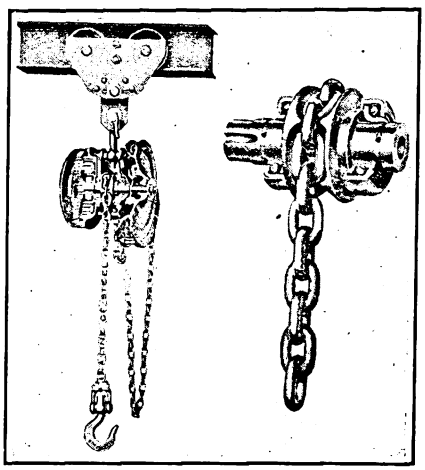
THE horizontal edgewise switchboard indicating instruments manufactured by the General Electric Company, Schenectady, N. Y., and known as its H-2 type, have been redesigned, the new line being designated as type H-5. The line includes ammeters, voltmeters, wattmeters, power-factor meters and frequency meters, for use where the measurement of electrical energy is necessary.

Among the changes are improved armature coil and pointer construction; increased insulation of current winding; non-corrosive finish on frame, magnets, screws, etc., and new strip-wound magnetic shield. The jewels and pivots in these instruments have been reversed, the jewels being mounted on the armature shaft while the pivots are mounted in the frame, thus permitting their ready removal.

Ball-Bearing Chain Block

A DEVELOPMENT in hoisting equipment, consisting of a ball-bearing spur-geared chain block, has just been placed on the market by the Yale & Towne Manufacturing Company, Stamford, Conn. Two chrome alloy ball bearings which support the load-sheave shaft are arranged to take the entire weight of the load and to withstand the shock of all thrust and overload surges. The bearings are inclosed in small chambers and provision is made by means of steel and felt washers to prevent dust and grit from entering the bearings.

Continuous lubrication of the bearings, driving pinion, shaft and driving gears is a feature. The top



Sectional View of Chain Block, and the Arrangement of the Ball Bearings Which Support the Load Sheave

hook, crosshead, suspension plate, load sheave, load chain, detachable shackle, bottom crosshead and hook are all of steel. An increase in mechanical efficiency of more than 6 per cent has been obtained through the introduction and use of ball bearings, where they carry the full load. The new ball-bearing blocks are furnished in capacities of from ¼ to 20 tons.

Unit Bus Heater

AN IMPROVED type of unit bus heater for installation under seats is being placed on the market by N. A. Petry Company, Inc., Philadelphia, Pa. The unit consists of cast ends with straight pipes connecting. It is made in two sizes of tubing, 1⅝ in. and 2 in., and in both vertical and horizontal types standard lengths are 5 ft. to 9 ft. The tubing is welded in the malleable-iron manifold castings, which are provided with removable plugs to facilitate cleaning of the tubes. The horizontal type is made especially for

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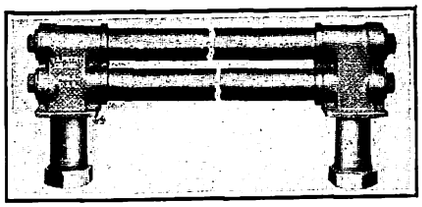


Unit Type of Bus Heater for Installation Under the Seats

de luxe coaches having full-width cross-seats. Connections between adjacent heaters are made under the floor of the bus.

Anchorage for Track Bumpers

A BUMPING post for stub-end tracks has recently been placed on the market by the Hayes Track Appliance Company, Richmond, Ind. In appearance it resembles existing types with rigid construction but presents a distinctive form of anchorage to the track. Tension legs with U-shaped ends pass completely under the rail and up on the outside where the end is held in position by a pin passed through it. The bearing of each of these legs is carried by a shoe which is bolted to the rail and spiked to the supporting tie. A flange on the underside of each of these shoes bears against the side of the adjacent tie. Tie anchor bars connect with a lug on the upper face of each shoe and are spiked to the four ties ahead of the bumping posts to complete the system of anchoring the tension members to the ties.

The anchorage of the back legs is accomplished by using steel posts which seat against shoes bolted to the rail. These shoes are provided with flanges which fit against the face of the adjacent tie and with tie anchor bars which extend over the three ties ahead. The anchorage thus brings eight ties into play and is based on the theory that for the best results bumping posts should be connected with the ties rather than with the track rails.

The compression members fit the compression shoe and the seat in the head in such a way that while bolted at each end the bolts do not carry the compression. The tension members are rectangular bars, which are not only curved at the lower ends but also at the upper end in order completely to go through the head. A large pin below the bumping head holds the tension members in place. As an additional precaution, the two compression joints are connected together by a tie rod at the lower end to keep them from spreading under the shock of an oncoming car.

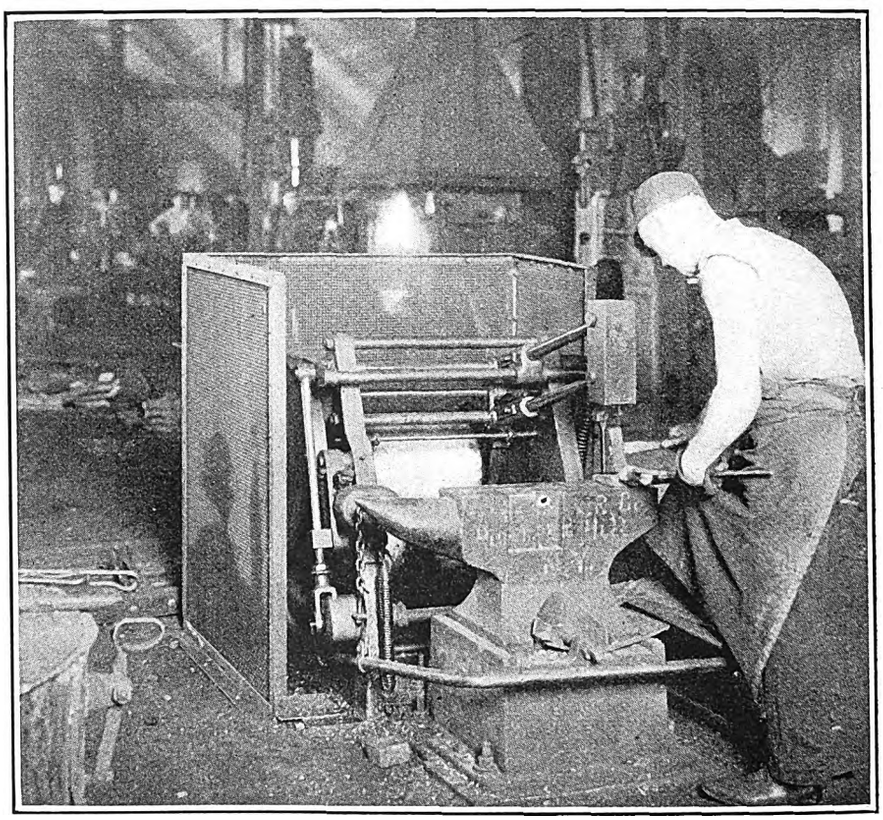
Mechanical Helper for Blacksmith Shop

A NEW type of power hammer intended for use with standard anvils is being introduced on the market by the Blacker Engineering Company, Inc., New York, N. Y. This is essentially a mechanical helper developed so that blacksmiths can use their own hand tools and anvil now available and replace the human strikers and hand-swung sledges.

The maximum blow of the machine is about four times as heavy as a human striker averages, and the machine attains the rate of 140 blows per minute on both light and heavy work. Lateral motion is provided so that the hammer can travel the entire face of the anvil and strike any part desired. The lateral transverse motion is controlled by a winged foot lever conveniently located to the right of the anvil. The head can thus be centered exactly over any point where it is desirable to strike a blow and can be located over the two hardie holes for swaging, punching and similar work.

The striking head is located at the end of two pairs of arms. These can be adjusted so that the work is always struck a flat, straight blow. The movement of the head is exactly similar to that of a hand-swung sledge. It rises to strike the blow and then rebounds quickly from the metal. The usual distance between the head and the anvil is 8½ in. The stroke can be adjusted to suit any particular work in hand.

The hammer can be driven from a line shaft or can be provided with an individual motor drive where desirable. When driven from a line shaft, tight and loose pulleys of 15-in. diameter by 2¾ in. face are recommended and the belt should have at least a 7 ft. drive. The individual motor-driven unit is most compact and offers several advantages. The motor is mounted on a small stand in the base and geared through a large driving gear on the main shaft. A 1-hp. motor is employed and any standard make can be supplied.



Mechanical Helper in Use at the Morris Park Shops of the Long Island Railroad

Several electric railways are using this type of hammer with success, among which are the Cleveland Railway and the Long Island Railroad. The accompanying illustration shows the hammer in operation at the Morris Park shops of the Long Island Railroad.

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The News of the Industry

Commission Controls Rates

Decision in Richmond Case Affecting Virginia Railway & Power Places Jurisdiction with State Body

The Supreme Court of Appeals of Virginia has decided that notwithstanding provisions of the Constitution of Virginia, acts of the General Assembly, ordinances of the city of Richmond, and contracts between the city and the Virginia Railway & Power Company and its predecessors, the State Corporation Commission is clothed with the final authority to establish rates for the transportation service supplied by the company. In its opinion the Supreme Court upholds the ruling of the State Corporation Commission in the appeal of the city of Richmond against the company.

It was control over rates on trackage operated under various franchises granted prior to the adoption of the Constitution of 1902, before the establishment of the State Corporation Commission, that constituted the issue in the case just decided. That issue has been decided against the contention that the right to regulate rates of public service corporations chartered prior to 1902 is reposed in the cities and towns in which such corporations are operated. The court holds, with the State Corporation Commission, that the state's reserved police power, to be exercised in behalf of the public weal and for the general well-being of the state, is paramount—in the absence of specific constitutional provisions limiting this police power—even over contracts which were valid when made and which are inviolable as between the parties to such contracts. It further holds that the constitutional provisions cited by the city and referred to in the opinion do not suffice to limit the state's police power to the extent of depriving the state of the right, through the agency established by the instrumentality of the Corporation Commission, to fix such rates.

As the Richmond *Times-Dispatch* says, the court, in the case of the Town of Victoria vs. Victoria Ice, etc., had already held that the Corporation Commission had jurisdiction over rates in franchises granted after 1902, when the present Constitution became effective. In fact, the court discussed the Victoria case. In so doing it quoted the conclusions announced in that opinion, part of which reads:

> That the state having reserved the right to prescribe rates, the General Assembly has . . . designated the tribunal and prescribed the procedure for the investigation of such rates thus specified by municipal ordinance adopted since the present Constitution became effective; that the State Corporation Commission is thereby expressly vested with jurisdiction, after hearing and investigation, to prescribe different rates adjudged to be reasonable, anything in such ordinance to the contrary notwithstanding; excepting therefrom, however, such contracts, if any there be, as may have been authorized by the state before the present Constitution became effective.

Almost at the end of its opinion in the present case, the court says:

> Whether the conclusion herein reached follows as a result of "evolution" or "revolution," we feel that, in the promotion of the common weal, it is the best solution of a most difficult situation. Any other settlement of the matter would depend upon legislative action, and we do not think that the issues involved should be cast as driftwood into the uncertain current of politics.

In commenting on the decision the *Times-Dispatch* said:

> It is assumed there is little likelihood of an appeal to the Supreme Court of the United States, for the reason that the decision does not precisely involve impairment of a contract; it holds that the contracts in question are valid enough until the state exercises its inherent and retained right to regulate certain matters connected with and growing out of those contracts. Unpleasant as it may be for municipalities to contemplate, it is hardly open to question that the State Corporation Commission is better qualified to evaluate properties and fix rates than the average council of the average city or town.

Bus Fare Cut Suggested at Detroit

Mayor Opposes Fare Discrimination—Street Railway Commission Claims Bus Rate Corresponding to Railway Fare Would Mean Loss

IN response to a recommendation from Mayor John W. Smith that the fare on buses operated by the Detroit Department of Street Railways be reduced to 6 cents to correspond with the fare on the municipal railway, the statement is made by the Street Railway Commission that such action would cause a deficit of $250,000 a year. Mayor Smith's recommendation was studied thoroughly in connection with the showing the buses have made in the few weeks they have been operated.

A 10-cent fare is now charged on all buses. This entitles the passenger to a transfer to the nearest railway line. By paying an additional cent the rider can transfer to the second car line. The payment of an 11-cent fare thus enables the rider to go down town from outlying districts which previously had no reliable transportation service.

Mayor's Case Stated

In making his recommendation, the Mayor pointed out that the city would demand not more than a 6-cent fare if the service into the outlying districts were afforded by means of trolley cars. While it was realized that much of the bus service must be given under conditions that would mean a loss at a 6-cent fare, the Mayor holds to the belief that D.S.R. operation must stand as a single endeavor and that there can be no discrimination in fare between residents of one part of the city and residents of another.

In reply Ross Schram, general manager of the D.S.R., says the commission would not have built railway lines on some of the routes at present because of the prohibitive costs.

The commission's study indicated that the present fare of 10 cents charged on the buses will result in a deficit of approximately $100,000 a year. At the present time the same taxes for buses are required from the street railway department as from the Detroit Motorbus Company. This yearly tax paid by the D.S.R. and the private company is reported as approximately $400 per bus. A reduction in the city's rate of bus fare should be accompanied by a lowering of taxes, and the lowering of the fare, the commission believes, would also curtail the extension of bus service.

In summing up, the commission agrees that the coach fare should be reduced if the policy is to be followed that was established before the advent of the automobile and before the extraordinary annexations to the city.

The communication to the Mayor, signed by G. Ogden Ellis, president of the commission, said in part that:

> For the purpose of serving the greatest possible number of people, this department installed the first of its coach lines on New Year's Day, and since that time has laid 30 miles of coach routes, running through the outlying sections. Within the next two or three weeks all of this 30 miles of routing will be in operation. There is more than 23 miles in operation at present. These routes are operated by 50 light-type coaches and in one year they will run 2,187,000 coach miles.
>
> At the present rate of fare this operation is failing to meet expenses by 7 cents per mile. As the riding developed, this deficit may be absorbed to some extent, but we are confident that even the present rate of fare will not prevent a deficit of more than $100,000 for the first year. Furthermore, we will be required to expend at least $50,000 for service arrangements within the next few months. If we make the coach fare the same as the street car fare our books indicate that we will have an operating deficit for coach service of at least $250,000 for the first year.
>
> The traffic upon the majority of these routes which have been installed indicates that in not more than one or two cases would we, from the standpoint of good railway practice, be justified in extending our tracks. We point out these cases to show that we have gone ahead to install this coach service in a great many places where we would not have considered installing car service, feeling quite certain that we would be permitted to charge an extra fare. If we are to reduce the coach fare, the extent of our coach system must be greatly curtailed from that which we have in mind.
>
> To indicate the scope of our plans, we will, in 30 days more, operate one-third as much mileage as the Detroit Motorbus Company. With this coach installation of 30 miles we outrank every street railway in the manner of pioneering in outlying districts, and this regardless of the rate of fare paid on our trolley cars.
>
> Another point for your consideration lies in the fact that we are paying the same pavement tax for our vehicles as is paid by the Detroit Motorbus Company with heavier equipment. If our fare is to be reduced, should there not be an adjustment of our paving charge?

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Atlanta Regulates Jitney

Motor Vehicles Ruled Off Railway Streets and Out of the "Congested Area"

The City Council of Atlanta on Feb. 2 eliminated jitneys from the streets of the city by a vote of 22 to 8 when an ordinance introduced by the special traction committee was adopted.

The ordinance really supplants a measure adopted originally in April, 1919. It has been the subject of a bitter fight ever since it was drawn up by the special committee. Stated briefly, the new law provides that all jitneys be prohibited from operating on any streets where car lines are in operation, on streets within two blocks of and parallel to streets occupied by car lines, and on streets in the downtown district of the city in what is known as the "congested area."

The ordinance, however, contains provisions by which buses with a seating capacity of 17 persons or over may operate in sections not served by the railway, thus permitting the bus lines now operating between Morningside and Sylvan Hills to maintain schedules.

Under an amendment to the original ordinance, operators of buses will be forced to carry $10,000 of indemnity insurance against single accidents, with a maximum of $50,000, instead of posting a $5,000 indemnity bond for each person who might ride in the bus, as provided in the original measure.

The ordinance provides a fine of $200 or 30 days at work on the public works of the city, or both, for each violation of the ordinance. Every day on which the bus is operated in violation of the ordinance is to be considered a separate offense.

The final clause of the ordinance gives the City Council the power to license buses to operate at any place or at any time, as well as to deny bus owners the right to operate on the public streets of the city. Under this last provision there will repose with the Council the right to permit the operation of buses at any time in competition with the street cars if it felt that the service being rendered by the railway is inadequate.

The ordinance becomes effective 30 days after it has been signed by the Mayor. The regulations now about to be put into effect have long been desired by the Georgia Railway & Power Company and are along lines suggested by John A. Beeler in his expert report to the city.

Two-Track Subway Suggested for Pittsburgh

Daniel L. Turner has formulated his plan for transit relief for Pittsburgh. A two-track subway extending from Chatham Street along the line of Fifth Avenue and Sixth Street to Duquesne Way is the substance of the report of the traffic commission. It was presented to the Council on Jan. 29.

No promise of immediate relief from downtown congestion is held in the conclusions reached by the traffic commission, as the solution presented contemplates a future rapid transit system of which the Fifth Avenue Federal Street is the initial section and can be built for $6,000,000 or the amount voted in the 1919 bond issue for a subway in the First and Second Wards.

Before a start can be made on this, the report states a year would be spent in making an intricate survey of underground conditions, including the underground systems of the public utilities, foundations and strata formations.

Briefly, the plan provides an east and west rapid transit between the East End and Northside, the general lines of Ellsworth and Frankstown Avenue to the East and Federal Street to North Avenue. A future consideration of the plan is for another subway from North to South following the general line of Grant Street.

The Rat's Revenge*

WITH a rat pursuit is not delusion but a hideous reality. The hand of every man is against him. Waking or asleep, his life hangs by a thread. What is more natural, therefore, than that he seize any opportunity that offers to wreak his spite upon his enemies? Who can blame the rodent which gnawed through the insulation of a 30,000-kilowatt generator in the main Interborough power house at Fifty-ninth Street and the Hudson River, thereby causing a short circuit which resulted in the second most complete subway tie-up in the history of the city?

To a rat the men who seek to trap or destroy him because he wastes their substance are as sinister as any interests that ever set out on the trail of a public official. Lacking the gift of oratory with which to denounce these pursuers, without a stenographer to whom he could dictate denunciations of them, what was more reasonable than that he should avail himself of the only means at hand to "get back at them"?

To be sure, a subway tie-up of twenty minutes is not comparable to a subway tie-up of seven years. But a rat without official position, without a political organization or a Hearst newspaper behind him, without even a radio station through which to launch accusations against potential destroyers, can hardly expect to interrupt a city's transit system indefinitely. He can only do his poor best.

Had this spirited little creature been clothed with power, filled with the belief that he was being hounded not for his shortcomings but for his virtues, and inspired with an ambition to overthrow all who disliked him, he might have wrecked the whole plant and kept the people out of subways till an entire new equipment could be installed. He was, however, but a rat. And while he could not approach the record for subway hold-ups that will stand for all time, his was an achievement of which he has no cause to be ashamed.—Editorial from New York *Tribune*.

*Apropos of a tie-up on the lines of the Interborough Rapid Transit Company on the morning of Feb. 2.

"Friday the Thirteenth"

Eventful Day for Chicago in Purchase Negotiations Announced by Mayor Dever

"The money lenders are satisfied; for the city I can say we have driven a good bargain." With these words Mayor Dever of Chicago buried his threat to repudiate the recent appraisal of the Chicago Surface Lines and ended nearly a year of jockeying over the price to be paid by the city in the event of municipal purchase. The figure referred to is the 1907 compromise basis price of approximately $163,000,000.

The Mayor set Feb. 13 for the completed traction bill to go to Council for adoption. This will be too late for referendum at the Feb. 24 election. The purchase of the properties and the approval of the $500,000,000 traction plan will then have to wait for the judicial and aldermanic election of April.

No effort is made to conceal the chance of defeat at the polls, and this, the Mayor says by inference, is because of the good management under which the lines are being conducted. He said:

> And yet the people are skeptical. For many years the lines were terribly managed. The people are afraid to change—afraid of politics. But we have guarded them against that.

This ignores and at the same time answers William Hale Thompson, a bedfellow in demagoguery of Mayor Hylan of New York, who has a slate of aldermanic candidates out shouting of "Wall Street," "La Salle Street," the "interests," and what not in no way connected with taking a street car to work in the morning.

Mayor Dever said to bankers, that failure of the city plan would knock the bottom out of traction company finances and that there would not be a dollar toward paying the principal of $110,000,000 due in 1927.

George E. Brennan said he would put the Democratic party organization behind the purchase plan and drive it through.

Mr. Maltbie on Milwaukee's Proposed Franchise

W. H. Maltbie, consultant on public utility valuations, rates and taxation, Baltimore, has an extended article in the January issue of the *National Municipal Review* on the proposed service-at-cost franchise in Milwaukee. This franchise is to be submitted to the voters before adoption, and its principal terms were published in the ELECTRIC RAILWAY JOURNAL for Oct. 4, 1924, page 571.

In Mr. Maltbie's opinion, the chief interest in the Milwaukee franchise, which provides service at cost, is in the mutual concessions which have been made by the municipality and utility, in order to reach a working basis and in the safeguards that have been devised for the protection of the interests of both parties. On the other hand, Mr. Maltbie points out that the contract seems to provide no reward for efficiency. It does, however, work to the benefit of the city in that it reserves to the city the right of inspection of practices and to insist (subject to arbitration in event of dispute) on the adoption of new methods.

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Indeterminate Franchise Sought in Oakland

The Key System Transit Company, Oakland, Cal., has started a campaign to secure an indeterminate franchise to replace the present short-term franchises, some of which will expire in 1933 and the remainder by 1936.

This question will probably be put up to the voters at the election in April and it is likely that until the matter is definitely settled none of the extensions recommended in the joint traffic survey, which has been in progress since last summer, will be built.

President C. O. G. Miller of the Key System says it is impossible to finance improvements in which a large amount of money is involved under short-term franchises. He says:

> The company is willing to make these extensions recommended by engineers appointed by the California Railroad Commission, the city of Oakland and the Key System provided the necessary funds can be obtained and provided a reasonable expectation can be indulged that the people from whom these moneys are obtained will be assured of an adequate return on the investment and the company assured of a continued right to operate the property under proper conditions for a proper length of time.
>
> We are ready, therefore, to co-operate with the public authorities of the East Bay cities and especially with those of the city of Oakland in the preparation of such franchise provisions as will receive the approval of the electors and adequately protect the public interest, while enabling us to meet the public demand for increased service.

No railway extensions have been made since the present Oakland charter was amended in 1917.

An amendment to the charter such as has been proposed has an excellent chance of passage at the polls, as most of the voters, realizing that the bay cities are growing rapidly, are willing to do almost anything in order to secure better transit.

The franchises of the Southern Pacific electric lines in Oakland expire on March 6, 1930. So far this company has made no announcement of future intentions, but it is likely that the company will stand with the Key System in seeking charter amendments.

The Southern Pacific electric service in the bay cities is practically all interurban; that is, between the various bay cities and their suburbs and San Francisco. That company has no feeder lines and recently abolished its Alameda service. Some extensions of this service have been talked of at various times, but it is certain that they will never be effected under the terms of the present Oakland charter.

Massachusetts Arbiters Refuse Wage Increase

The arbitration board has declined to increase the pay of employees of the Middlesex & Boston Street Railway, Newtonville, Mass., from the present rate of 55 cents an hour to a new level of 70 cents an hour. Judge Malcolm E. Sturtevant of the Somerville police court, chairman of the board, says that the trend of the cost of living is downward, and that the road cannot pay higher wages at present. The arbitration award will be binding until Dec. 31, 1925. The board favors an 8-hour day, but instead of fixing this limit leaves it to the company and union to settle. Miscellaneous employees are awarded overtime at the rate of 50 per cent extra for each half hour or fraction thereof. Pitt F. Drew, president of the railway, served with Chairman Sturtevant as one of the arbitrators. James H. Vahey was the carmen's representative on the board. He dissented from the decision.

Reorganization and Rehabilitation in Cincinnati Promised

If the proposed new 25-year traction ordinance is accepted by the city of Cincinnati, Ohio, the Cincinnati Street Railway will be reorganized and will launch a program that will include bus "feeder" lines and the operation by the company of the rapid transit system. Samuel Assur, vice-president of the Cincinnati Street Railway, has so advised the city administration. He pointed out that the reorganized company could finance such a program of improvement by issuing "modern first mortgage bonds from time to time when interest costs on the market are low." These bonds at reasonable rates of interest would provide funds for years to come.

With regard to rapid transit, Mr. Assur said that the passage of the new ordinance would mean that engineers would be employed at once by the company to make a traffic survey and an estimate of the cost of equipping and operating the "loop" upon its completion to Oakley. This would mean that the $6,000,000 "sunk in the loop by the city" would not become a total loss. Mr. Assur said that the loop could be made to co-operate with the present system so as to give rapid transit to many communities and that when the success of the loop had been established rapid transit should be provided for the western and extreme eastern suburban sections. Mr. Assur declared that the company would be able to operate under a 7½-cent fare, despite the predictions of the members of the citizens' traction committee to the contrary.

Bill Aims at Missouri Bus Jurisdiction

A bill was introduced in the Missouri Legislature on Jan. 21 to place motor transportation under the jurisdiction of the Missouri Public Service Commission. It provides a fee in addition to the regular motor licenses for the operation of the automobiles used in public service. The bill is broad in its terms and includes the St. Louis buses and service cars.

The Missouri Public Service Commission would, under the terms of the bill, govern the rates, operation and equipment of motor carriers and fix the tax which they would have to pay cities and counties in which they operate. Bus companies would not be permitted to operate without a certificate of convenience and necessity issued by the state board. Senator McCawley said the purpose of the bill was to protect the public and encourage responsible bus companies. The bus lines would be subject to periodical inspection, their load weighs regulated and they would be required to report regularly to the Public Service Commission.

West Side Project Advanced in New York City

The New York Central Railroad is ready to build without cost to New York City a $24,000,000 combined automobile express highway and elevated freight railroad along the west side of Manhattan from Seventy-second to Canal Street. In consideration of the improvement the New York Central would accept a readjustment of its rights and easements along its lines and in its yards.

Borough President Miller has been negotiating for 6 months with the New York Central. He took up with railroad executives the question of eliminating surface railroad operation by steam on Eleventh Avenue at about the time that he concluded negotiations for the opening of Depew Place—the bottle neck of Park Avenue at the Grand Central Terminal.

The city's chief gain from the elevated express highway and freight railroad, according to President Miller, would be the removal of the dangerous railroad tracks from the surface of Eleventh Avenue and the reclamation of 84 blocks of street surface for traffic. The removal of the tracks would eliminate 100 grade crossings and would provide an entirely new avenue connecting with the vehicular tunnels at Canal Street. The express motor highway would be on the roof of the elevated freight railroad.

Of the total cost of the project $13,000,000 is the amount for the freight railroad and $11,000,000 for the motor highway.

In commenting on the proposed undertaking President Miller, among other things, said:

> For 77 years the Hudson River Railroad has operated a steam surface railroad on west side streets. The dangerous condition ensuing and the deaths resulting from this operation were apparent from the start. For years State Legislatures, city officials, commissions, associations and many others have endeavored to abolish the tracks on "Death Avenue." In addition, the presence of the tracks and their noisy, unsightly operation casts a blight upon the west side of the city, and has greatly retarded the development of one of the most accessible districts in Manhattan, adjoining its most valuable waterfront.
>
> Under the plan now proposed the tracks will be taken off these streets; the entire district, which has long been stagnant, will develop commercially on account of the new facilities planned and the value of this great area of real estate will be enhanced.

In the official announcement no mention is made of the intended electrification of the lines, but the very nature of the improvement implies that this change will follow.

Bus Company Organized in Anderson, Ind.

Walter Shroyer, secretary-treasurer, Harry A. Nichol, general manager, and Arthur W. Brady, president of the Union Traction Company are the incorporators of the Traction Motor Transit Company, Anderson, Ind. While it is said that the purpose of the Traction Motor Transit Company is to operate a bus now in use between Fort Harrison and the Union Traction station, it was indicated by Mr. Brady that the company also will operate trucks. That the company would do so has been stated unofficially before.

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Economic Marketing in Industry

Secretary Hoover Stresses the Place of the Technical Paper in the Business World

Economic marketing in industry, with particular stress laid on the help industrial and business papers may give in cutting the corners of waste in sales and distribution, was the general topic of discussion in a three-day convention of the business and editorial representatives of the fifteen publications of the McGraw-Hill Company, publisher of the ELECTRIC RAILWAY JOURNAL, which closed Friday night, Jan. 30, with a dinner in the Hotel Pennsylvania, New York. Reading of a letter from Herbert Hoover, Secretary of Commerce, in which that Cabinet official stressed the importance of the industrial and business publications as leaders in economic and industrial thought, was one feature of the banquet. Julius H. Barnes, formerly president of the Chamber of Commerce of the United States; Fred I. Kent, vice-president of the Bankers Trust Company, New York; David Sarnoff, vice-president and general manager of the Radio Corporation of America, and Fred M. Feiker, vice-president of the Society for Electrical Development, were the guest speakers.

Outstanding American industrialists took part in the sessions of the convention itself. Their talks followed closely the lines laid down for discussion and each speaker stressed important phases of the effort of the McGraw-Hill Company to develop to the maximum its program of service to industry in promoting economic and efficient selling and distribution methods. Facts brought out in the company's nationwide survey of the buying habits of industry were emphasized repeatedly in the convention and round-table group discussions.

The convention opened Wednesday morning, Jan. 28, with a discussion of the new era of sales development by James H. McGraw, president of the McGraw-Hill Company. There were talks by important industrialists, these including W. L. Batt, president of the S.K.F. Industries, Inc., and P. L. Thompson, advertising director of the Western Electric Company and a past-president of the Association of National Advertisers.

Secretary Hoover's letter, read at the dinner by Mr. Feiker, struck the keynote of the convention. He said:

> I wanted to attend your convention to say a personal word of appreciation for the fine service which you, your company and your publications are rendering to American industry. It is a real disappointment to me that I cannot come.
>
> A big change has come in the spirit of American business, and for this change you are in part responsible. I mean the change from rule-of-thumb and *laissez faire* to scientific determination of facts and programs of action based on facts. The business press is probably the greatest force in making industrial opinion. The schools and colleges have an important place, the trade associations can do much in the fields of production and distribution, the government bureaus that keep in contact with business can help to promote sound leadership in industrial and economic thinking. All have an important place, but the business press and technical journals are in a unique position and have a unique opportunity. I believe that no organization of technical publications has come nearer to living up to this opportunity than the McGraw-Hill publications under the leadership of James H. McGraw.
>
> The thought that I have in mind is that your great group of journals cannot only recognize and support sound industrial leadership, you can also initiate it. The field of your opportunity is practically limitless.

The objectives of the sales convention were outlined at the dinner by Malcolm Muir, vice-president of the McGraw-Hill Company, who also reviewed briefly the accomplishments of the three days of discussion. Edward J. Mehren, vice-president of the company and chairman of its editorial board, was toastmaster and spoke briefly at the close of the dinner, stressing the opportunities of the industrial press, as brought out in the convention, to serve the whole field of industry.

Service Must Be Cut or Fares Raised in Buffalo

Immediate reduction in service on the local lines of the International Railway, Buffalo, will be necessary unless a higher rate of fare is authorized at once by the Public Service Commission. Herbert G. Tulley, president of the corporation so stated in a formal notice served on the Public Utility Commission.

Mr. Tulley says that for the three years past the International Railway has been supplying a service which cost much more than the fares collected. In 1924 the cost of this service exceeded the receipts by $660,000. He says service has been made possible through liberal contributions from the owners, a condition which can no longer be continued. The company cannot this year commit itself to the expenditure of the $500,000 desired by the city of Buffalo in its track and repaving program until an increased fare has been authorized.

In a letter addressed by President Tulley to Mayor Frank X. Schwab, he says in part:

> It was from the first recognized by the railway that bus service on Delaware Avenue and Delavan Avenue would have to be run without a profit. The results show this to be the case. In our desire to do everything possible to secure your co-operation, we have been willing to add this deficit to the sum of our earlier losses, which have been occasioned largely through the Mayor's continued connivance with the enemies of the company in diverting every possible passenger to the irresponsible jitneys and in fighting against our every planned economy.
>
> The International has been operating a bus line in Bailey Avenue at a 7 cent fare with a loss of more than $2,000 a month. The company can, however, go no farther in this direction and has requested the Public Service Commission to at once permit collection of a 10-cent fare without which service must be soon discontinued.
>
> The city is desirous that the company shall this year spend about $500,000 for track replacement and paving. This, we shall be unable to undertake, unless and until increased revenue be received. Meanwhile the only expenses which we can undertake will be those necessary to the better protection of our passengers or in line with more economical operation.

President Tulley says that the operating deficit for 1924 has been increased to $1,660,000. He says a street railway must expect to give some non-paying service, but that when the operation as a whole results in a continuing deficit there is nothing to do but stop running the losing lines and continue the profitable ones.

Opposed to Fare Charge

Complaint has been made to the New York Public Service Commission by the municipal authorities of Buffalo against the practice of the International Bus Corporation, a subsidiary of the International Railway Company, Buffalo, of charging 17 cents for a one-way fare from the Kensington district to Black Rock and vice versa when passengers use the Delevan Avenue bus line across town. The bus company will not issue a transfer to a passenger after a transfer has been tendered for a fare. When passengers are required to use a street car to reach the bus, a second transfer from the bus to another car line is denied.

Mayor Frank X. Schwab, at the request of associations of business men and taxpayers in Buffalo, asked Herbert G. Tulley, president of the bus and traction companies, to make this adjustment, but the company says it is a problem for the Public Service Commission. The city authorities also have asked the commission to order the bus company to allow children in arms to ride free when not occupying a seat. The company now makes a charge of 10 cents for children in arms whether occupying seats or not.

Virginia Commission Denies Petition

The Virginia Corporation Commission recently denied the petition of the Alexandria Suburban Motor Vehicle Company, a subsidiary of the Washington-Virginia Railway, to operate bus lines as feeders. At the same time the commission allowed the petition of Robert L. May for a certificate to operate a bus system between Washington and Alexandria.

The railway proposed 24 round trips a day on its feeder lines, while it was brought out that the May system of buses was operating 64 round trips a day and giving adequate service. It was further testified that if the electric railway ceased operation the bus system could handle the traffic. For the past seven months Mr. May has been operating buses under the name of the Alexandria, Barcroft & Washington Bus Lines.

A meeting of the bondholders' committee of the Washington-Virginia Railway will decide this week the fate of the company. Whether the road will be reorganized or definitely pass out, as a means of transportation in and near the Capital City, will be settled. Arthur L. Reynolds, receiver for the company, said that there were two courses open. One is that the bondholders will effect the reorganization of the road on the basis of its present physical valuation, and the other is for complete junking of the line and its abandonment as a carrier between Washington and near-by Virginia. He places a physical valuation of the road as a growing organization at about $4,500,000. He said if the road were junked about $700,000 could be obtained by sale of equipment. A bondholders' committee has been formed and Day & Zimmermann have been retained to investigate the engineering phases of the road's operation.

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News Notes

Fares Advanced. — Electric railway fares in Athens will be advanced to 10 cents for one cash fare, with two tickets for 15 cents in the near future. An announcement to this effect was made recently following approval of a petition from the Athens Railway & Electric Company to the Georgia Public Service Commission. As an offset to the advance in cash fares, the Athens Railway & Electric Company will offer a weekly pass book, good for all members of the family, for $1.

Inspection Trip Over New Extension. —The first train over the Niles Center extension of the Chicago, North Shore & Milwaukee Railroad and the Chicago Rapid Transit lines carried a party of about 50 officials of the companies and of the towns served on Feb. 1. Operation over the new road will be started within a short time. The trip was in the form of an official inspection tour and took place just 10 months after work was begun on the branch, which is 5 miles in length. The extension has eight stations, underground, elevated and surface tracks, new catenary trolley wire suspension and many other modern types of construction.

"What Would You Do" Again Asked. —E. M. Walker, president of the Schenectady Railway, Schenectady, N. Y., had reproduced in the Schenectady *Union-Star* of Jan. 28 an editorial entitled "What Would You Do?" This editorial appeared in a recent issue of the Philadelphia *Public Ledger* following the recovery of the company from the difficulties accompanying a heavy snowstorm. The editorial was the subject of comment in the ELECTRIC RAILWAY JOURNAL.

Car Riders Entertained by Transit Guest.—The "Transit Guest" will appear each month in the car racks of the Pittsburgh Railways, Pittsburgh, Pa. The paper will keep the residents of the city informed of the aims and performances of their railway property. The premier number, under date of Jan. 1, gives a few important points on the boarding of cars and also the accomplishments of the company during the past 11 months. The columns of the "Transit Guest" will be open to the public to address the editor on any subject relating to public utilities.

Fare Lowered. — The Connecticut Company, operating buses between Hartford and New Britain, after a conference with the Public Utilities Commission, has reduced the fare between these two points from 33⅓ cents to 25 cents, which is a three-token ride. The commission ordered the Connecticut Company to extend the first fare zone out of New Britain to Isbell's Corner, an addition of about 1 mile, effective Feb. 1.

Buses as Auxiliaries.—Bus service to the Mordecai development and to Roanoke Park was put into effect recently by the Carolina Power & Light Company, Raleigh, N. C., according to an announcement by Paul Tillery, general manager of the company. Two White buses are operating and a third is on the way. Buses and railway fares are the same, but there is a 2-cent transfer charge between buses and street cars. The cash fare is 8 cents or two tickets for 15 cents. School tickets are good on the buses, but the regular transfer change applies. The appliion to operate buses was made to the City Commissioners and was immediately granted. Mayor E. E. Gulbreth made it plain that the company was granted a license and not a franchise. Under this arrangement either the city or the power company may discontinue the buses when either party sees fit. The plan is to extend the service to other sections of the city if it proves successful.

Higher Fare Extended. — At an executive meeting of the Public Service Commission, held on Jan. 28, the 7-cent fare for the Binghamton Railway, Binghamton, N. Y., was approved, effective Feb. 1, 1925. The old fare was 6 cents, and since 1920 has been continued from year to year by the city and the commission. The city's consent to the proposed renewal was given some time ago.

Terms of Wage Advance Accepted.— Herbert G. Tulley, president of the International Railway, Buffalo, N. Y., has announced that exactly 99.6 per cent of the employees of the company have agreed to the terms of a wage increase, made on condition that the money be converted to the purchase of the company's bonds and stock in furtherance of its policy of employee ownership. This is the second increase of its kind. The wage increase for 1925 is 3 cents an hour payable after the company earns and pays the 5 per cent interest on its bonds. The basic wage will continue at 55 cents an hour. It is said that the co-operative wage fund has been used to purchase $220,000 of bonds at 50 and 9,000 shares of stock at an average of $10 a share.

Higher Fare Allowed.—On the showing of the company that it could not operate profitably on a 7-cent fare and consent having been given by the city of Newburgh to an increase to 10 cents the Public Service Commission on Jan. 29 authorized the Newburgh Public Service Corporation to put into effect a fare of 10 cents on its bus lines. Eleven tickets will be sold for $1 and school tickets for children only at the rate of 14 for $1. The new rate is effective Feb. 1 and will continue for one year. The application of the company was referred to previously.

Interurban Fares Reduced. — Announcement has been made by the Pacific Northwest Traction Company of a reduction of interurban fares to all points south of Everett, Wash., as far as Beverly to a flat 10 cents, with slight reductions in cash fares from Everett to Alderwood Manor. One-way cash fare to Beverly has heretofore been 12 cents. Action of the company is based upon acquisition of the tracks of the local street railway from the interurban station to the city limits. Transfers to local lines by cash fares will be abolished, but transfers will be continued for those using 30 ride books. The price of 30-ride books, now in effect between Everett and Seattle, will be reduced 80 cents a book.

Buses Put in Operation.—Buses were put into operation on Feb. 1. on Broadway, Cambridge, Mass., between Kendall Square and Harvard Square by the Boston Elevated Railway. Fares will remain 10 cents for through trips and 5 tickets will be sold for 30 cents for local use.

Interurban Service Supplied by Buses. —Interurban service on the Aurora-Yorkville line of the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., has been supplanted by buses. J. F. Egolf, general manager, announced that the interurban line south of Montgomery would be dismantled. The new buses are Whites with special Shaffer bodies. Each has a seating capacity of 25. The new schedule provides for bus service on both sides of the river.

Petitions for Rehearing.—The City Council of Buffalo has petitioned the New York State Public Service Commission for a rehearing on the application of the municipal authorities for an order prohibiting the operation of one-man cars on local lines of the International Railway. The city contends figures presented by the traction company witnesses showing the percentage of accidents to car-miles on one- and two-man cars were not accurate and tended to mislead the commission. The company's figures showed a fraction of 1 per cent more accidents with one-man cars than with the full crew cars.

Traction Company Accepts Council's Proposals.—The Rockford City Traction, Rockford, Ill., has presented a franchise to the City Council adapted in its principal provisions to many City Council suggestions. This action threatens to involve the Council in a lengthy battle because of the franchise submitted earlier by T. M. Ellis, Jr., representing the newly formed Rockford Public Service Corporation. The traction company's franchise accepts Mayor Hallstrom's recommendation of a wage board of local citizens, investment of State Commerce Commission with right to fix liability for share of costs in remodeling or building bridges and accession of a tract of land at First Avenue and Kishwaukee Street to the city. Some revisions in routes are included. The traction company first objected to a referendum as unnecessary, but in its draft accepts such action.

Fare Increase Under Consideration. —The State Railroad Commission will decide soon whether or not the Beloit Traction Company, Beloit, Wis., is entitled to the 2-cent fare increase it is seeking. Traction officials pointed out that Beloit is the only city in the state with a 5-cent fare and a 4-cent book rate.

Complaint Against Increase Dismissed.—The complaint of the Mayor and City Council against the increase in street car fares in Johnstown, Pa., charged by the Johnstown Traction Company has been dismissed by the Public Service Commission. The new tariff, which has been effective since early last fall, raised the price of a single trip from 7 to 10 cents, but tokens are sold at the rate of four for 30 cents, making the new rate for regular passengers 7½ cents. The rates on the Windber cars and on the bus lines remain at 10 cents.

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Financial and Corporate

Interurban Reorganization Planned

Indiana Road to Pass to Insull Control —Rehabilitation and Change from A.C. to D.C. Contemplated

A proposed plan for the reorganization of the Chicago, Lake Shore & South Bend Railway, South Bend, Ind., improvement of that property and the turning of its management over to Samuel Insull and associates is being submitted to the bondholders by a "first lien holders" committee in Cleveland. After the plan is approved by the bondholders, the legal proceedings carried to a successful conclusion and the program finally approved by the Public Service Commission, the new company will work out a program which will include changing the present alternating-current electrification of the railroad to direct current.

The South Bend line, a 125-mile electric railroad, runs between Chicago and South Bend, Ind., by way of Hammond, East Chicago, Gary and Michigan City. The Chicago terminus of the line is at Kensington, but trains are run downtown over the Illinois Central suburban service tracks. No change in the present plan of operation is contemplated.

The railroad has been operated at a loss for several years. According to the bondholders' committee, new financing is necessary in order to improve the property and put it in a position to give better service.

Entire Plan Still Tentative

Mr. Insull and associates already are interested in the operation of other public utility properties in the territory served by the railroad. The Northern Indiana Gas & Electric Company, of which Mr. Insull is president, serves several of the cities through which the railroad passes, and the Calumet Gas & Electric Company, of which Mr. Insull is also president, serves the adjacent territory. Naturally he is interested in the growth and development of the territory because of the operation of these properties, and has agreed to take over the management of the railroad provided the plan of the bondholders' committee is carried to a successful conclusion.

The entire plan, however, is at present in a tentative state. To be effective it must first be accepted by the bondholders, foreclosure proceedings must be prosecuted through the courts, and, finally, the whole plan must be approved by the Public Service Commission of Indiana. If the bondholders' committee is successful in carrying out the various details of the plan, the management of the property will then be assumed by Mr. Insull and associates. No detailed plans for the rehabilitation of the property have been worked out as yet, as control of the property cannot finally pass to Mr. Insull and associates until all details of the reorganization plan have been accepted by all parties concerned.

The bondholders' committee is composed of Harris Creech, president of the Cleveland Trust Company; John Sherwin, chairman of the board of the Union Trust Company; Warren S. Hayden, of Hayden, Miller & Company; J. R. Nutt, president of the Union Trust Company, and H. P. McIntosh, chairman of the board of the Guardian Trust Company, all of Cleveland. It is understood that the Cleveland Trust Company as trustee for the bondholders will shortly file a foreclosure suit.

The company has $4,776,000 of bonds outstanding, nearly all controlled by Cleveland men.

After a hearing in the foreclosure proceedings, the plan contemplates that the property will be sold under a foreclosure order to the new company which will be organized under the laws of the State of Indiana, and that application will be made to the Public Service Commission of Indiana for authority to issue the following securities:

First or first and refunding mortgage bonds.
Cumulative preferred stock.
Second mortgage, 6 per cent bonds aggregating $250,000.
Adjustment mortgage bonds aggregating $1,750,000 maturing in fifty years.
100,000 shares of common stock of no par value.

The first or first and refunding mortgage bonds will be sold to provide funds for re-electrification and other improvements necessary to enable the railroad to give improved service.

The cumulative preferred stock will be issued to raise funds for the same purposes and also to provide money for general corporate purposes.

If the plan is carried out, the second mortgage and adjustment mortgage bonds will be turned over to the "first lien holders" committee for the benefit of the present bondholders.

Boston "L" Has Largest Business in 1924

The Boston Elevated Railway, Boston, Mass., is operating to its financial advantage at the present time, but it lost $336,696 during the fiscal year ended Dec. 31, 1924. Its losses were incurred during the first 10 months. Since Nov. 1 there has been an excess of receipts over the cost of service. The business of the Elevated during 1924 was the largest in the history of the company, both in the matter of total number of passengers carried and the total revenue. Such are the outstanding facts in the annual report which the public trustees of the road have submitted to the Legislature. Owing to the increases in wages, ordered in arbitration proceedings, the operating labor cost of the past calendar year amounted to $17,358,670, an increase for the year of $1,134,394.

Following the latest wage increase the company announced an increase in its 5-cent fares to 6 cents, and the trustees believe that this extra cent will aid largely in meeting the extra cost, as riding does not appear to have diminished. They express the opinion that by the end of the fiscal year, June 30, the receipts will at least equal expenses.

Totol receipts in 1924 were $34,175,-319 and the cost of service was $34,812,-016. The number of revenue passengers carried was 382,888,848. During 1924 there were 739,151 more revenue passengers carried than in 1923. Passenger revenue mileage was increased by 1,939,014 miles, in large measure due to increased use of one-man cars, which permitted an increased service without corresponding increase in cost. The one-man car and bus miles amounted to 31.7 per cent of the total surface miles operated. The increase in revenue passengers occurred on weekdays and Saturdays, there being a decrease of traffic on Sundays and holidays.

The operation of buses was increased. The miles covered in 1922 were 63,937 in 1923, 465,382, and in 1924, 890,901.

The accident record of the year has shown improvement. Operating expenses on this account were lowered from $975,021 in 1923 to $914,043 in 1924. Accidents per 1,000,000 miles operated with one-man cars were reduced from 230 in 1923 to 205 in 1924. Accidents per 1,000,000 miles operated with two-men cars were reduced from 259 in 1923 to 249 in 1924.

Supreme Court Holds Combination Is Not Illegal

Monopoly in the control and distribution of electric power in the State of Tennessee was held to be authorized by the statutes of the state by the Supreme Court, Jan. 24, in the case of the state on the relation of the Attorney-General vs. Nashville Railway & Light Company, et al.

This suit was instituted to dissolve a combination which had been effected between the Nashville Railway & Light Company, the Chattanooga Railway & Light Company, the Tennessee Power Company and the Chattanooga & Tennessee River Power Company, the voting power of all of which corporations had been by various purchases and arrangements vested in a holding company, called the Tennessee Electric Power Company of Maryland. By this combination the holding company had acquired control and indirect ownership of the hydro-electric power plants on the Caney Fork, Ocoee and Tennessee Rivers, and, as found by the court, had effected a unity of control in the distribution of electricity within all of the territory of Middle and East Tennessee covered by the transmission lines of the power company.

The Supreme Court was of the opinion that the statute creating the Public Utilities Commission and other statutes regulating public utilities and authorizing the organization and combination of public utilities companies have the effect of expressly authorizing monopoly in the production and distribution of electric power and service under the control of the Public Utilities Commission, which approved the combination under attack. The Su-

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preme Court held, therefore, that the anti-trust laws forbidding combination in restraint of trade do not apply to the control of electric power.

The opinion of the Supreme Court in this case was delivered by Justice Cook, affirming the decree rendered by Chancellor James B. Newman of Nashville.

Wants to Abandon Portion of Tracks

The Westchester Electric Railroad, New York, N. Y., has filed with the Public Service Commission a petition for permission to abandon a portion of its route and franchise in the village of Tuckahoe on Yonkers Avenue and a portion on Main Street. A declaration of abandonment was adopted by the stockholders of the company on Dec. 24. The route of the Westchester company connects at the Bronx River with the route of the Yonkers Railroad on Tuckahoe Road in Yonkers.

The petition states that it is impracticable to make a physical transfer of passengers at the Bronx River, with the result that the Yonkers Railroad has been operating its cars over the Westchester company's Tuckahoe line beyond the tracks of the New York Central to Waverly Square in the village of Tuckahoe. The Yonkers company has applied for permission to abandon the portion of its route which is on Tuckahoe Road in Yonkers east of Nepperhan Station, and the Westchester company's petition sets forth that if this petition is granted there would be no longer any public convenience or necessity requiring the operation of its route on Main Street and Yonkers Avenue, Tuckahoe, between the New York Central tracks and the Bronx River. Convenience of the public would be better served, the company says, if any bus franchise granted for service on Tuckahoe Road in the city of Yonkers were extended along Yonkers Avenue and Main Street, Tuckahoe, to the New York Central Station.

Reorganization of Northern Ohio Electric Corporation Approved

At a meeting of the stockholders of the Northern Ohio Electric Corporation held on Jan. 27 there were represented 119,738 shares out of 135,000 shares of preferred and common stock outstanding. The plan for reorganization of the corporation, dated Dec. 30, 1924, and the contract for the sale of all of its assets in accordance with that plan were approved. The vote was 119,510 shares for and 228 shares against.

As 87.66 per cent of the outstanding stock has been deposited under the plan and 2.51 per cent additional has been pledged for deposit, a total of more than 90 per cent, the plan has been declared operative, subject to (a) the receipt of opinion of counsel approving the transfer of assets of the Northern Ohio Electric Corporation to the Northern Ohio Power Company and all legal details in connection therewith; (b) the payment for new securities of the Northern Ohio Power Company by the subscribers and underwriters, and (c) the delivery to depositaries of the securities of the new company called for by receipts issued by such depositaries.

Subscriptions aggregating $1,766,200 were received from depositors of preferred stock and these subscriptions will be allotted in full on the basis stated in the plan. Deducting this amount from the $2,800,000 offered for subscription leaves $1,033,800 applicable to the 75,000 shares of common stock as outlined in the plan, or $13.79 per share on which basis allotments will be made in amounts of $100 or multiples thereof, on subscriptions received from common stock holders.

In all cases where subscriptions were made on the full payment basis a call has been made for full payment on Feb. 18, 1925, and in all cases where subscribers elected at the time of making subscriptions to pay in installments a call of 15 per cent of the subscription allotted has been made, payable on Feb. 18, 1925, and for the payment of the remaining installments of 25 per cent each on April 1, 1925; June 1, 1925, and August 1, 1925.

The assets of the company taken over consist practically of all the outstanding $10,000,000 of common stock of the Northern Ohio Traction & Light Company, which operates the city lines in Akron and an extensive system of interurbans.

Is San Francisco's Municipal Line Profitable?

San Francisco officials are at odds over the question as to whether or not the Municipal Railway is being operated at a loss. Supervisor J. B. McSheehy charges that the present system of handling the depreciation fund has made it appear that the road is losing money, whereas the road is making a net profit of $41,000 a month. According to Mr. McSheehy, the depreciation fund is being diverted from its rightful purpose and being used for the construction of extensions.

The supervisor quotes figures to show that since the start of the road 12 years ago revenues have been $25,942,219, with operating costs of $17,541,623, leaving a gross profit of $8,200,597. In addition, according to Mr. McSheehy, payments on account of funded debt have been $2,374,962 and disbursements for accidents and damages $258,708, leaving a net profit of $5,466,927 for the 12 years.

This profit, Mr. McSheehy claims, has been entirely depleted by bond redemptions, loans to the general fund and additions and betterments. He urges as a remedy for this condition the establishment of a depreciation fund by setting aside 3 per cent of the road's gross passenger revenue.

Supervisor Shannon is not so sure about the feasibility of this plan. M. M. O'Shaughnessey, city engineer, is studying plans for six extensions made necessary by the recent growth in population. These improvements cannot be long delayed if proper service is to be maintained. Mr. Shannon is of the opinion that a bond issue may be necessary to expedite the construction of these extensions unless the McSheehy plan is found feasible.

There are other elements in the city that claim that the road is steadily losing money and that it will be necessary to raise fares to the 6-cent level to make the road pay.

This conclusion is assailed by the carmen, who have asked for an increase in pay, and is also frowned on by most of the supervisors, many of whom will come up for re-election in the spring. The labor element is with the carmen. It favors the McSheehy plan to establish a 3 per cent fund taken from the gross passenger revenue.

Supervisor Ralph McLeren, it must be remembered, has a plan that calls for the establishment of a 4 per cent fund.

These plans are all held in abeyance pending the report to be made by the city engineer after he has studied the immediate needs of the city, has estimated their costs and has made his recommendations.

Issue of Stock Approved.—The Board of Public Utility Commissioners of New Jersey has approved the application of the Atlantic Coast Transportation Company, Asbury Park, N. J., to issue $1,000 of capital stock. This is a bus line controlled and operated by the Atlantic Coast Electric Railway.

Reduced Valuation Case Scheduled.—The suit of the city of Rochester, N. Y., to reduce the valuation of the Rochester lines of the New York State Railways under the service-at-cost contract is scheduled to come up in Equity Term of the Supreme Court early in March. Justice John B. M. Stephens will preside.

Wants to Abandon Line.—The North Randall Railway, Cleveland, Ohio, recently applied to the Public Utilities Commission at Columbus to abandon its line from the end of the Broadway city line to the North Randall racetrack. Win L. Kinnan, president, said that the company lost $1,600 last summer, was now losing $700 a month, and owed the Cleveland Railway, which operates it, $30,000.

Revenues Decreased.—A decrease of $211,543 in revenue compared with 1923 is the result of 1924 operation of the Oklahoma Railway, Oklahoma City, Okla. The city lines received $133,622, or 14.2 per cent less than in 1923, while the decrease on the interurban operation was $77,921, or 12.81 per cent. Revenues for December, 1924, shows an increase over December, 1923, attributed to the extreme cold weather.

Authorizes Stock Sale.—The Alabama Public Service Commission has recently granted permission to the Birmingham Electric Company, Birmingham, Ala., to issue and sell 70,000 shares of nonpar value preferred stock, paying annual dividends of $7 a share. The stock is to be sold so as to net not less than $90 and accrued dividends per share. Proceeds of the sale will be used to pay for various improvements.

No Fatal Accident in Altoona.—The Altoona & Logan Valley Electric Railway, Altoona, Pa., during 1924 carried 18,949,702 passengers without a single fatal accident, according to the annual report of S. S. Crane, general manager. A total of 679 accidents was reported, of which 553 were due to automobiles backing on the track or "beating" a car to a corner. The company owns more

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than 58 miles of car line and during 1924 operated 2,883,000 car-miles. The payroll for the year was $589,358, with an expenditure of $167,349 for track maintenance and $80,167 for equipment maintenance.

Extra Dividend by Holding Company.—The Railway, Light & Securities Company, Boston, Mass., has declared an extra dividend of $1 a share on the common stock and the regular semi-annual dividends of $3 a share on the common and preferred stocks. The dividends were paid on Feb. 2 to holders of record of Jan. 15.

Seeks Authority to Remove Trackage.—The Pacific Electric Railway has applied to the California Railroad Commission for authority to abandon and remove its tracks on the West Colorado Street and Orange Grove Avenue line, Los Robles Avenue and Washington Street line and the California Street line in the city of Pasadena. Motor coach service has been substituted.

Report on Electric Roads Tax Returns.—Of the 138 electric railroad companies making income tax returns in 1922, 62 paid cash dividends during the year of $11,904,765. With 38 companies which did not pay cash dividends they had surplus and undivided profits at the close of the year of $42,599,884. The net taxable income reported by the 138 concerns was $25,570,140.

Asked to Deposit Bonds Separately.—Holders of both the 5 per cent first mortgage bonds of the Indianapolis Northern Traction Company and 5 per cent general mortgage bonds of the Union Traction Company of Indiana are being asked to deposit the bonds with separate depositaries. This request is made so that committees may be appointed to conserve the interests of the holders of the respective bonds.

Wires But Not Tracks Removed.—Samuel Goldman, Woonsocket, R. I., who purchased all the equipment of the Medway & Dedham Street Railway, Dedham, Mass., which suspended operation several weeks ago, has completed the work of removing all feed wires. No plans have been made for removing the rails because the towns through which the trolley passes have declared that if they are removed the streets will have to be restored at the expense of the person who removes the rails.

December Shows Profit.—Profits of approximately $69,000 in excess of expenses are shown in the report for December, 1924, filed by the Cincinnati Traction Company with W. Jerome Kuertz, Director of Street Railroads of Cincinnati. The receipts from all sources aggregated $848,264, while the total expenditures were $779,180. The expenditures were as follows: Operations, $484,970; taxes, $68,154; deductions and bonds, $16,150; rentals and leases, $104,030; interest and sinking fund, $40,842; return on capital, $134,117. Of the last item $35,043 was for December and the remainder represents payment on account due the company as return on capital provided for under the present ordinance. There is still due the company $181,287. The company recently borrowed $437,500 to pay the franchise tax due the city from October, 1923, to Dec. 31, 1924.

Preferred Stock for Sale.—A syndicate headed by Dillon, Read & Company, New York, is offering at $100 per share to yield 7 per cent $3,000,000 of 7 per cent cumulative first preferred stock, known as series A, of the Ohio Public Service Company, Mansfield, Ohio. Among its properties this company operates the city lines in Mansfield and the interurban lines connecting Mansfield and Shelby.

Net Income Increases.—For the 6 months period ended Dec. 31, 1924, the total operating revenue of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $21,448,951, against $19,576,898 for a similar period in 1923. The expenses increased from $13,001,474 for the last six months of 1923 to $13,968,699 for the last six months of 1924. The net income, however, increased. It was $1,836,712 for the 1923 period and $2,598,518 for the period from July to December, 1924.

Massachusetts Road Does Better.—The Gardner-Templeton Street Railway, East Templeton, Mass., is now free of debt. On Aug. 1, 1924, the line was $3,000 in debt. In December the road cleared $1,026 above expenses. Checks have been sent out paying every debt of the company, according to Edgar A. Shepardson, Baldwinville, the acting president. The company expects two new cars soon as part of the equipment included in its modernization plan. The tracks were all put in good condition during the summer and fall.

Buses May Be Substituted. — The Black River Traction Company, Watertown, N. Y., is reported to have offered to buy the fleet of buses, garages and equipment of the Watertown Transportation Company. The railway's apparent intention is to replace the trolleys with buses.

Net Income Increases.—For the 12 months period ended Dec. 31, 1924, the Philadelphia Rapid Transit Company, Philadelphia, Pa., had a net income of $1,810,365. The year before the net was $1,800,000. The passenger revenue increased from $44,249,361 to $45,002,700 for the 12 months period of 1924. The passengers carried showed a falling off—the number being 917,787,235 for the period from January to December, 1923, and 909,303,945 for the period of January to December of last year. Following the meeting of the company in March a more extended review of the operations during the past year will be given.

Traffic and Revenue Decrease.—The gross income of the Grand Rapids Railway, Grand Rapids, Mich., during the past year was $672,157, a decrease of $24,263 over 1923. Passenger revenue in 1924 totaled $1,719,562, a decrease of $34,738. Passengers carried totaled 24,825,018, a decrease of 3,733,839 over 1923. Car mileage during 1924 totaled 3,727,767 miles. The equalization account at the end of the year showed a deficit of $143,081.

Receipts Show Falling Off.—Receipts of the street railway department of the Georgia Railway & Power Company, Atlanta, Ga., decreased at the rate of $1,200 a day during the last 6 months of 1924 as compared with a similar period in 1923. The total decrease was $221,022 compared with a similar period in 1923. For the first 6 months of 1924 receipts were $9,072 less than for the first half of 1923, making a total decrease of more than $230,000 in receipts for the year as compared with receipts in 1923. Officials estimate that the railway department of the Georgia Railway & Power Company carried 3,361,410 fewer passengers in 1924 than it did in 1923, and attributed this loss largely to unregulated jitney and bus competition.

Company in New Hands.—Acquisition of the properties, rights, privileges and franchises of the Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., by the Mississippi Power Company was announced recently. The consideration was not made public. The traction company, a $2,000,000 concern, operates 30 miles of car tracks in Harrison County and furnishes illuminating current to Gulfport, Longbeach, Mississippi City, Biloxi, Pass Christian and Ocean Springs. Barney E. Eaton, general attorney for the Gulf & Ship Island Railroad Company, is president of the Mississippi Power Company.

Opposes New Power Line.—The Holyoke Water Power Company maintains that it is the logical concern to supply power to the Holyoke Street Railway, Holyoke, Mass., and will oppose the entrance of the Turners Falls Company into its territory. Consequently the question has gone to the Massachusetts Department of Public Utilities. Some time ago the stockholders of the Holyoke Street Railway ratified the action of the board of directors in arranging for the sale of the railway power plant to the Turners Falls Power Company. The terms of the agreement were mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 22.

Six-Month Period Shows Deficit.—The total revenue of the Interborough Rapid Transit Company, New York, N. Y., for the 6 months ended Dec. 31, 1924, was $28,552,713, an increase of $469,792 over a similar period of 1923. The operating expenses, including taxes and rentals, were $18,967,226, a decrease of $428,608 over the 6-month period ended Dec. 31, 1923. The income available for all purposes was $9,004,927. In the similar period of 1923 the income was $7,247,292. After the consideration of fixed charges, reserve and dividend rental the result showed a deficit of $248,517. The balance in the period from July to December, 1923, was an increase of $1,278,650 over that figure.

Deposits Increased.—For the year ended Dec. 31, 1924, the co-operative welfare association saving fund of the Philadelphia Rapid Transit Company, Philadelphia, Pa., showed receipts of $1,789,209. The total disbursements were $1,762,243. The cash balance on Dec. 31, 1924, was $26,966. The cash balance on Jan. 1, 1924, was $9,899. Interest at the rate of 5 per cent per annum credited to depositors' accounts for the year 1924 amounted to $98,319. Mr. Farley, president of the association, told fellow directors at the close of his term as president that the deposits had increased more than $200,000 during the year just ended. At the same time the membership in the fund had increased more than 1,400, to 9,792.

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Legal Notes

CALIFORNIA. — *Negligence of Employer of Injured Person Not a Defense.*

The employee of a gas company, while laying pipe in the street, was injured by a trolley car. Damages were collected by his heirs from the gas company under the workmen's compensation act and suit was then brought against the railway company for a larger amount. The court held that on any damages collected from the railway company, the gas company had a first lien up to the amount paid to the employee under the compensation act, but that the railway company could not interpose as a defense the contributory negligence of the employer in order to defeat the plaintiff's claim to the extent of the amount of compensation paid by the employer under the compensation act. (Milosevich et al. vs. Pacific Electric Railway, 230 Pacific Rep., 15.)

CONNECTICUT.—*Burden on Plaintiff to Show Liability Under Last Clear Chance Doctrine.*

A person was killed at night while on trolley tracks which were close to the traveled portion of a country road. To warrant the assessment of damages against the company, the burden of proof is on the plaintiff to show that the motorman ought to have become aware while there was time to avoid accident of the presence of the deceased on the track. (Polna vs. Connecticut Co., 126 Atlantic Rep., 529.)

GEORGIA.—*Franchise Ordinance Which Was Accepted Held to Be Enforceible Contract.*

A franchise called for the construction of electric railway lines in a city and suburbs and also provided for a gas and electric service. The latter was profitable, but the company did not build the suburban railway extension specified. It put on a bus line in its place and claimed that the State Railroad Commission had jurisdiction in the case. The position of the city, demanding complete compliance with the franchise, was upheld. (City of Spartanburg et al. vs. South Carolina Gas & Electric Co. et al., 125 Southeast Rep., 295.)

MASSACHUSETTS. — *Contract by Street Railway to Pay Annual Sums for Locations Held to Relate to Taxation and Be Invalid.*

In 1902 a railway agreed to pay a town $900 annually "with such sum in excess thereof as would equal its excise tax payable to said town for all its tracks therein located in public ways." A considerable part of the line was on private right-of-way, but later, it absorbed a local railway with considerable track on the highway. Up to 1920, the amount levied and paid as an excise tax on the combined property exceeded the sum of $900 a year. In 1919 the legislature passed a statute that no further excise taxes should be collected of street railway companies. The town attempted to collect from the company after that year on the ground that the payment was not an excise tax, but the court decided otherwise, and held that taxation is a function of the general legislative department of the state, and laws established by it cannot be waived or changed by municipalities or their officers. (Inhabitants of Southborough vs. Boston & W. Street Ry., 145 Northeast Rep., 422.)

MASSACHUSETTS. — *To Move Car from One Berth to Another Not Negligent.*

The plaintiff was waiting on a subway station platform when the car she expected to take stopped at one berth, but before the doors were opened, it moved to another berth. The plaintiff was thrown down and injured by the crowd which rushed first to the first boarding point and then to the second, but no negligence on the part of the company was shown. (Alward vs. Boston Elevated Railway, 125 Northeast Rep., 332.)

MICHIGAN.—*Decision of Public Utility Commission Upheld in Telephone Case.*

A public utility company is entitled to earn enough to meet the continuous depreciation of its plant and equipment and to provide funds from earnings to offset this depreciation. Such a fund is the property of the utility, and it has the right to invest this fund and earn on it, and such fund should not be deducted from present fair value in fixing a rate base. Upon the issue of confiscation in the fixing of rates, a federal question, decisions of the United States Supreme Court control. The allowed rate of depreciation, 4 per cent on total fair value, less land and right-of-way, though small, was not confiscatory. (Michigan Public Utilities Commission vs. Michigan State Tel. Co., 200 Northwest Rep., 750.)

MISSOURI. — *Police Patrol Wagon Has Paramount Right of Way.*

A police patrol wagon, answering a call, approached a place on the street where there were island platforms for the use of street railway passengers. The driver of the patrol wagon would have kept on the outside of the island platform on his side of the street except that the street was very narrow at this point because of building operations and a pedestrian attempted to cross in front of the wagon. It was therefore turned into the space between the loading platforms and struck a street car coming in the opposite direction and just entering its berth. The company was held responsible because the motorman of that car should have stopped it at the approach of the patrol wagon. (Hogan vs. Fleming et al., 265 Southwest Rep., 875.)

VERMONT—*Priority of Claim Against Insolvent Railway Company.*

The Supreme Court of Vermont ruled as follows in regard to various claims against an electric railway company in the hands of a receiver. The franchise required the company to pave the track area and authorized the city to do the work and charge the cost to the company if the company failed to do so. It did not provide for any special lien on the company's property, in case the company failed to pay for the work, but the company had to file a bond with the council, conditioned upon the faithful performance of its duties and obligations under its franchise. This bond was filed for the company before it became insolvent by a surety company, which recompensed the city for its paving charges after the company became insolvent and then set up a claim for priority of this indebtedness because of its nature. This claim was brought in the name of the city but its priority was denied by the court. The claim of the state of Vermont for taxes, based on the value of the company's property which included franchise rights, was held entitled to priority in receivership proceedings. An injured passenger who had attached property of the railway was held to have a lien prior to existing mortgages thereon, under the Vermont statute. The principal other claims were those of a power company, which owned approximately 90 per cent of the capital stock of the railway company, and sued for payment on various claims. It was shown that practically all of the directors and to some extent the other officers of the two corporations were the same persons during the time that the claims of the power company accrued. One of these claims was for office rent and office accounting; another was for expressage, freight, labor and supplies. Another was for power furnished. Another was for funds advanced. All of these claims were judged according to the criterion of whether they were "services rendered or materials furnished for the purpose of keeping the road in repair or in running the same." Tested by this rule, office rent, clerk hire, bookkeeping, funds advanced, and express and freight charges paid were classified by the court as unsecured claims, but electric current for power and lighting was classified as material furnished and received preference. Other lesser claims not given priority were for legal services, printing, telephone rentals, clearing snow from the tracks and premiums on an insurance policy to cover workmen's compensation liability. On the other hand, a claim from a manufacturing company for supplies for repairs of electrical machinery was entitled to preference. [Westinghouse E. & M. Co. vs. Barre & Montpelier Traction & Power Co. et al., 126 Atlantic Rep., 594.]

WISCONSIN. — *Duty at Street Railway Crossing.*

Where a person crosses street car tracks and knows, or could know in the exercise of ordinary care, that a trolley car is approaching at an excessive rate of speed, he must act accordingly. It is not sufficient that he should assume that the car is approaching at a reasonable and lawful rate of speed. (Balistrieri vs. Chicago, N. S. & M. R.R., 200 Northwest. Rep., 650.)

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Personal Items

J. P. W. Brown Most Valuable Citizen

Electric Railway Official at Nashville So Pronounced and Signally Honored for Outstanding Civic Service

John P. W. Brown, general superintendent of the Nashville Railway & Light Company, Nashville, Tenn., and Lieut. John Harding, Jr., Nashville's around-the-world flier, were jointly honored by the citizens of Nashville on Jan. 2 at a meeting of the Kiwanis Club at the Chamber of Commerce at noon.

Mr. Brown was awarded the Kiwanis loving cup in recognition of his outstanding civic service to Nashville during 1924.

Newspapers printed columns of the praises that were sung of Mr. Brown. It is timely to recount in summary the work which won for him the honor of "Nashville's ideal citizen." The title was given him because:

He led the 1924 Community Chest campaign to the most successful completion of its history.

He was chairman of the industrial committee of the Chamber of Commerce, and thus helped bring new industries to Nashville.

He did outstanding religious work as president of the Personal Workers of the First Presbyterian Church.

He was an active member of the board of directors of the Nashville Y.M.C.A., and in such work did valuable service to the young men of this city.

His division won first honors in the Vanderbilt "Fill the Stadium" drive.

And last: Serving with equal unselfish zeal in the ranks as an enthusiastic worker, his forceful efforts have constantly been attended by unfailing success, and an unfailing modesty.

Naturally the question arises, "What manner of man is it upon whom Nashville has conferred her greatest honor in the award of the pronouncement of him as its most valuable citizen?" John P. W. Brown became connected with the electrical industry in Nashville 27 years ago when he supervised the inspection of installations of all electric lighting, power and scenic effects at the Tennessee Centennial Exposition immediately upon the completion of his work at Vanderbilt University. He became identified with the Cumberland Electric Light & Power Company as switchboard operator in 1898, and 2 years later, when the Cumberland company was merged with the railway and became the Nashville Railway & Light Company, Mr. Brown was made superintendent of the lighting and power departments of the new company.

On May 19, 1917, Mr. Brown was promoted to the position of assistant general superintendent over the entire local railway and light property, and 5 years ago succeeded B. C. Edgar as general superintendent of the company, which position he still holds. That Mr. Brown's position has been one of increasing responsibility year by year is attested by the fact that when he entered the employ of the company only 300 light and power customers were being served, while at present the Nashville Railway & Light Company has more than 34,000 electric consumers on its power lines. In fostering that growth Mr. Brown played a most important part.

That his value and services have been appreciated is evidenced by his last elevation to the position of general superintendent of the Nashville property.

J. P. W. Brown

Transportation Department Divided in Detroit

A separation has been made by the Department of Street Railways, Detroit, Mich., of the duties of the transportation division of the property. The work relating strictly to routing, schedules, traffic, etc., has been taken over by a newly created traffic division, and the duties pertaining strictly to the operation of the cars has been taken over by a newly created operating division, so that the transportation division no longer exists.

E. S. Rider, formerly superintendent of transportation, has been appointed superintendent of traffic, in charge of the traffic division.

D. A. Smith, formerly assistant superintendent of transportation, has been appointed superintendent of operation, in charge of the operating division.

E. R. Hughes was elected chairman of the Oklahoma Corporation Commission on Dec. 29, 1924. Mr. Hughes was elected to the commission in 1920 and has two years yet to serve. He succeeds Joe Cobb as chairman.

Lord Ashfield, chairman of the London underground railway companies, has been appointed chairman also of the British Dyestuffs Corporation, Ltd., in succession to Sir William Alexander, M. P., who has resigned on account of his increasing business and political activities. Lord Ashfield has hitherto been a government representative on the board of the company, a position he now vacates in order to become chairman. Besides being chairman of the London underground railway he is chairman of the London General Omnibus Company, and he is associated with the boards of the Provincial Cinematograph Theaters, Ltd., the Midland Bank, the United Railways of Havana and Regla Warehouses, Ltd., and the Mexican Railway.

Consulting Engineer Resigns From General Electric

David B. Rushmore, one of the consulting engineers of the General Electric Company, has resigned following orders from his physician to take a long rest and avoid desk work.

Mr. Rushmore has served 25 years with the General Electric Company and with the Stanley Electric Company of Pittsfield, which was absorbed by the General Electric Company. He went to Schenectady in 1905, and for many years was engineer of the power and mining department. Since 1922 he has been one of the consulting engineers. Previous to his service with the General Electric Company, Mr. Rushmore was with the Westinghouse Electric & Manufacturing Company and later with the Royal Electric Company, Montreal.

He was graduated from Swarthmore College in 1894 with the degree of bachelor of science and engineering, and from Cornell University in the following year in the electrical engineering course. In 1897 he received the degree of civil engineer from Swarthmore, and in 1923 the honorary degree of doctor of science from that institution.

Changes in Stone & Webster Managerial Personnel in South

Howard C. Foss has assumed active supervision of the affairs of the Savannah Electric & Power Company, Savannah, Ga., as president, thus establishing a local president in charge of the operations of another of the large companies under Stone & Webster executive management. Because of the additional responsibilities assumed by Mr. Foss, his duties as Southeastern district manager for the Stone & Webster companies will be assumed by Alba H. Warren, now manager of the El Paso Electric Railway, El Paso, Tex. The Southeastern district office will remain in Savannah. Mr. Warren will take up his work there within a few weeks.

Robert C. Brooks, formerly manager of the Savannah Electric & Power Company, has been appointed manager of the Pawtucket division of the Blackstone Valley Gas & Electric Company at Pawtucket, R. I.

Tom P. Walker, formerly manager of the Baton Rouge Electric Company, Baton Rouge, La., has been appointed manager of the El Paso Electric Railway, El Paso, Tex.

J. F. McLaughlin, general superintendent of the El Paso Electric Railway, El Paso, Tex., is to succeed Mr. Walker at Baton Rouge.

Alfred F. Townsend, manager of the Eastern Texas Electric Company, Beaumont and Port Arthur, Tex., has been appointed vice-president and general manager of the operating subsidiary companies of the Western United Corporation with headquarters at Aurora, Ill. These subsidiary companies have

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recently signed contracts with Stone & Webster, Inc., Boston, Mass., for its executive management service.

J. G. Holtzclaw, receiver and formerly manager of the Pensacola Electric Company, Pensacola, Fla., succeeds A. F. Townsend as manager of the Eastern Texas Electric Company.

J. A. Phelan, for the last 4 years general superintendent of the Rockford City Traction and Rockford & Interurban Railway properties, Rockford, Ill., has resigned to accept a position as head of the time-table department of the Chicago Motor Coach Company.

Charles W. Dupuis, president of the Citizens National Bank, Cincinnati, Ohio, has been elected president of the Cincinnati Street Railway, operated under lease by the Cincinnati Traction Company. Mr. Dupuis succeeds Bayard L. Kilgour.

James Dalrymple, general manager of the Glasgow Corporation Tramways, Glasgow, Scotland, after an absence of 2 months on a visit to Bombay, has returned to Glasgow. He went to Bombay on the invitation of the tramway there to inspect the undertaking and to advise on its conduct.

Gen. Harvey Hannah was made chairman of the Tennessee Railroad & Public Utilities Commission at the recent reorganization meeting. Gen. Hannah has been on the commission several terms. Dorsey B. Thomas, formerly in the State Senate from Benton County, has been made secretary.

C. L. Henry, president of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., was re-elected president of the Indiana Public Utility Association at the annual convention held in Indianapolis on Jan. 22.

Charles B. Thomas, East St. Louis, Ill., former referee of bankruptcy for the Eastern Illinois federal court, resigned on Jan. 17 as special counsel for the receiver of the Alton, Granite & St. Louis Traction System.

S. C. Waggoner is road supervisor of the Indianapolis & Cincinnati Traction Company, with office in Rushville, Ind. He succeeds D. S. Petro.

Fred Capshaw has succeeded Joe B. Cobb as a member of the Oklahoma Corporation Commission. Mr. Cobb was chairman of the commission. He has been admitted to practice law in Oklahoma.

Clyde B. Aitcheson of Oregon has been elected chairman of the Interstate Commerce Commission for 1925. He succeeds Henry Clay Hall. The chairmanship is filled anew each year on a seniority basis from the membership of the commission.

L. C. Bullington, formerly assistant manager of the power department of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has been appointed manager of the Cincinnati district office. Mr. Bullington succeeds James A. Brett, who died recently in Bermuda. Mr. Bullington goes to Cincinnati, after a long connection with the Westinghouse company, first as southeastern manager with headquarters at Atlanta, Ga., and later as manager of the Buffalo district branch.

Dwight Dean Joins Forces of Motor Manufacturer

Dwight B. Dean, who recently joined the forces of the Yellow Coach Manufacturing Company, Chicago, with headquarters of his own at Cleveland, is one of the best known men in the electric railway industry in the central West, particularly the selling field. He has been an attendant at the annual conventions of electric railway men since 1889, the year the predecessor to the American Electric Railway Association met in Minneapolis. At that time Mr. Dean was employed as a salesman by the Electric Merchandise Company, Chicago. Consumer resistance was not known by that name then, but it existed in a superlative degree, as Mr. Dean quickly learned. He broke this resistance down so successfully for the Chicago company that the McGuire Company of the same city was quick to appreciate his ability and to send him out to sell car trucks. This was in 1891. Two years later he joined the forces of the Terre Haute Car & Manufacturing Company as sales manager of the street railway car wheel department.

Mr. Dean had learned so well how to induce his prospect to sign on the dotted line, as they say, that he was now directing others in the art of doing business successfully. For 7 years he remained with the Terre Haute company. In 1900 Mr. Dean again changed his job, but not his allegiance. He became connected with the J. G. Brill Company in charge of its Chicago office and Western territory. It was a good stroke for Mr. Dean and a better one for the Brill company. Mr. Dean's scope of activity was enlarged and the car manufacturer secured the services of a man who had proved his ability by more than 10 years of intensive work among people in an industry of which the car manufacturer was a part. Three years later the Brill company purchased the G. C. Kuhlman Car Company at Cleveland and Mr. Dean moved to Cleveland as sales manager. There he has continued ever since, a period in all of 24 years with the Brill interests.

Thomas F. Woodlock, New York, has been nominated by President Coolidge to be a member of the Interstate Commerce Commission, vice Commissioner Potter, resigned. Mr. Woodlock was born in Ireland in 1866. He was educated at Beaumont College, near Windsor, England, the Catholic public school corresponding to such schools as Eton and Harrow. He matriculated at the London University in honors. He went into business in the London Stock Exchange. In 1892 he came to New York and joined the late Charles H. Dow and Edward D. Jones in the Dow-Jones News Service. He immediately specialized on American railroads. His pamphlet on "The Anatomy of a Railroad Report" is still a textbook on the subject. After the death of Charles H. Dow, in 1902, he became the editor of the *Wall Street Journal,* which post he held until 1905. After his resignation he became a member of the New York Stock Exchange, in partnership with Schuyler N. Warren. After a few years he returned to newspaper work and economic writing, chiefly in connection with railroads.

J. D. Michele has been retained by the Youngstown & Suburban Railway as manager of its bus division, following the purchase by the company of the Canton-Youngstown Safety Coach Line. Mr. Michele entered the bus business in 1914, operating a line between Cleveland and Akron, Ohio. This was the beginning of the Cleveland-Akron Bus Company, which is now one of the principal bus enterprises of the state.

H. E. McWethy, for the past 3 years electric railway engineer for the Minnesota Railroad & Warehouse Commission, has opened an office in the Builders Exchange Building, St. Paul, Minn., to engage in practice as an engineer-statistician. He purposes to handle public utility rate analyses and valuations for presentation before public service commissions and courts and for purposes of stock and bond issues. Mr. McWethy received his technical engineering training at the University of Wisconsin, and was graduated from the College of Electrical Engineering in 1909. Then followed 2 years apprenticeship training with the Westinghouse Electric & Manufacturing Company at East Pittsburgh. In 1911 he became associated with the Wisconsin Railroad Commission at Madison, and served with this commission as a valuation engineer and rate expert until 1920. From 1920 to 1922 he was engaged as an appraisal expert in the valuations of the Nashville Railway & Light Company at Nashville, Tenn., the Philadelphia Rapid Transit Company, and for other properties. In 1922 he was retained by the Minnesota Railroad & Warehouse Company as its expert adviser in the valuation proceedings involving the electric railway systems of the Twin Cities and Duluth.

Obituary

Oliver P. Balliet, one of the first engineers of the plant of the Allentown & Reading Traction Company, Allentown, Pa., died Jan. 10 at his home in Forrest, Ohio. He was at the time of his death general manager of the Hardin Electric Power Company.

Col. Jorgen Ording, who as draftsman and engineer assisted in the construction of the first cable car lines of Denver, Col., died recently at Christiansand, Norway.

William C. Kelly, a pioneer in elevated railroad service in Chicago, died on Feb. 1, following an illness of about 3 months. He was 67 years old. During the World's Fair in Chicago Mr. Kelly was employed by the intramural railroad, the first electrically operated elevated railroad, and at the close of the fair became associated with the Metropolitan West Side Elevated Railroad, with which he was connected until the time of his death. He aided in the construction of the road, which was begun in 1894. Mr. Kelly was one of the oldest employees in point of service with the present Chicago Rapid Transit Company.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Differential Steel Car Company Receives Traction Orders

The Cleveland Railway, Cleveland, Ohio, placed an order recently with the Differential Steel Car Company of Findlay, Ohio, for four standard motor-equipped Differential door chute cars, two standard trailer Differential door chute cars, two flat rail cars and four crane cars of a new type just designed by the Differential Steel Car Company. The Boston Elevated Railway has also placed an order with the Differential Steel Car Company for one Clark concrete breaker and the Key System Transit Company, Oakland, Cal., has ordered one Clark concrete breaker.

Buses Not Included Among White Price Reductions

No changes in the prices of bus chassis or of heavy-duty trucks are included in the reductions ranging from $250 to $300 announced in certain White Motor Company products. In short, the reductions affect four of the ten White models, including both ¾-ton and 2-ton models.

Factory expansion and improvement in manufacturing methods have made reductions possible, it is explained. Some savings have been made in the cost of manufacturing light-duty trucks and these are being passed along to customers. With the beginning of the new year the company completed a program of expansion which greatly increased manufacturing facilities. This included the erection of the new engineering and research building as well as the acquisition of all buildings adjacent to the truck factory formerly occupied by the White Sewing Machine Company.

Cos Cob Station Enlarged

The use of nothing but electric locomotives on the New York, New Haven & Hartford Railroad between New York and New Haven has made necessary certain changes in the generating station located at Cos Cob, Conn. A new 9,000-kw. turbine and condenser will be used to replace one of the 3,750-kva. turbo-generators, which will be used in some other part of the power system. The contract for the equipment has been awarded to the Westinghouse Electric & Manufacturing Company.

Louisiana Utilities Spend Large Sums for Improvements

The 1924 report of the committee on public utility information showed that the public utilities of Louisiana and Mississippi expended more money on improvements than in any previous year. The New Orleans Public Service, Inc., occupied first place on the list, with $8,000,000. The Shreveport Railways spent $200,000 in improvements, $25,000 for special work for new car houses and shops, $35,000 for an automatic substation and a 3-mile feeder and $7,700 for paving. Three new cars were added to its equipment. The South New Orleans Light & Traction Company of Algiers made improvements to the sum of $28,173. The Baton Rouge Electric Company, Baton Rouge, made improvements that cost $464,454 to its plant, including an addition of 3.05 miles of track and five new cars.

Cement Production Increased

Figures on portland cement production for 1923 and 1924 show an increase of about 8 per cent. Production figures by districts are shown in the accompanying table.

Commercial District	1924	1923
Eastern Pennsylvania, New Jersey and Maryland	38,281	35,722
New York	7,547	6,990
Ohio, Western Pennsylvania, West Virginia	14,322	13,496
Michigan	9,162	7,620
Wisconsin, Illinois, Indiana, Kentucky	21,856	21,193
Virginia, Tennessee, Alabama, Georgia	11,347	7,909
Eastern Missouri, Iowa, Minnesota, South Dakota	14,851	14,037
Western Missouri, Nebraska, Kansas, Oklahoma	9,912	9,779
Texas	4,566	4,179
Colorado and Utah	2,425	2,428
California	11,615	11,002
Oregon, Washington, Montana	2,975	3,105
	148,859	137,460

American Brass in Waterbury

It was erroneously stated in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 10, that the office of the American Brass Company was in Bridgeport, Conn. The company has neither a mill nor an office in that city. Its general offices are located in Waterbury.

G. E. Welcomes Investigation

No action has been taken in the United States Senate on the resolution of Senator Norris ordering an investigation of the General Electric Company on the ground that it monopolizes or controls electric light and power company business. The resolution was returned to the Senate by its interstate commerce committee in a modified form. It had been planned to take up the resolution on Feb. 5, but consideration of the nomination of Attorney-General Stone to be a Justice of the Supreme Court prevented. Such an investigation would be welcomed by the company, according to Owen D. Young. In spite of the trouble and expense involved such a step is preferable to having unfounded charges made, he said.

Rolling Stock

San Diego Electric Railway, San Diego, Cal., has purchased 16 flat cars of the Union Pacific Railway for freight business. The equipment of the freight department will be augmented by an up-to-date 60-ton electric locomotive from the Westinghouse Electric & Manufacturing Company, Pittsburgh.

Union Traction Company, Coffeyville, Kan., it is reported, has purchased several one-man interurban motor cars.

San Antonio Public Service Company, San Antonio, Tex., plans to purchase a few light-weight double-truck street cars during the present year. The details of the purchase have not been made public.

Wilmington & Philadelphia Traction Company, Wilmington, Del., it is reported, has purchased eight Reo pay-enter buses for service in the city of Chester. The traction company was given the exclusive franchise subject to furnishing equipment by Jan. 9.

Track and Line

Houston, Tex.—Contract for the construction of the 110-mile electric interurban line of the Houston, Beaumont & Orange Interurban Railway has been awarded to W. H. Nichols & Company, railroad constructors, according to Ed Kennedy, promoter of the project. The contract stipulates that the work will be started not later than March 20. The terms of the contract are understood to be cost plus 10 per cent. The cost of completing and putting the line into operation was estimated by R. E. Gurley, chief engineer, at $5,333,062, or nearly $60,000 a mile.

St. Louis-Kansas City Short Line Railroad, through Lee Dunlap, vice-president, applied to the Missouri Publis Service Commission at Jefferson City, Mo., Jan. 28 for permission to build an interurban electric railway between St. Louis and Kansas City. The tentative date for a hearing on the application is Feb. 11. The plans of the company call for a standard gage, electrified double-track railroad. It plans to operate both freight and passenger trains. Promoters of the railroad claim the proposed route will be 40 miles shorter than any steam railroad operating between St. Louis and Kansas City.

Metal, Coal and Material Prices

Metals—New York	Feb. 3, 1925
Copper, electrolytic, cents per lb.	14.625
Copper wire base, cents per lb.	17.00
Lead, cents per lb.	9.60
Zinc, cents per lb.	7.71
Tin, Straits, cents per lb.	57.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.625
Central, Ill., screenings, Chicago, net tons	1.325
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.10
Linseed oil (5-lb. lots), N. Y., per gal.	$1.24
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.1297
Turpentine (bbl. lots), N. Y., per gal.	0.95

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, February 14, 1925 *Number 7*

Every Company Should Enter the Coffin Prize Contest

FOR the third time the invitation has been issued to the electric railways of the United States to compete for the Coffin Prize. This contest, which is one of several instituted by the Charles A. Coffin Foundation, has as its chief object the stimulation of progress by electric railways. In the past two years successful competitions have been held in which not only the prize winners but the other contestants have shown the great amount of improvement, material and financial, that could be made in electric railway operation, often under what appeared to be adverse conditions.

The best practices of and results obtained by the companies that competed in the two previous contests have been published in considerable detail in the ELECTRIC RAILWAY JOURNAL. The American Electric Railway Association itself collected similar material from the 1923 competition in an attractive book which has had wide circulation among electric railways. It is now preparing a similar book based on the 1924 contest.

With such examples before them it would seem that it is not only the privilege but the duty of every electric railway management to take all steps possible to secure similar improvements. And having embarked on a modernization program, it is a further duty to publish to the industry the results that have been obtained and the methods through which they have been achieved. There is no better way of accomplishing this than by entering the Coffin Prize contest.

Some managements have refrained from entering these contests because of a feeling that there was no one in the organization with time and ability to prepare a brief.

In order to make a creditable showing it is neither necessary that a railway go to great expense to collect data nor engage the services of a professional writer to present them. Any railway man with fairly broad experience ought to be able to give in simple language a good description of the noteworthy things his company is doing.

Let every railway, large or small, get together its list of achievements and submit them in this year's competition.

A Practical Scheme for Starting Educational Work

ONE of the convincing signs that electric railways have come back is their increasing interest in vocational training of employees. Only industries which are firmly established and are looking forward to larger opportunities and responsibilities are interested in education. Any railway manager will assent to the value of mental training. As a family head he wants it for his children; as a utility head, for his staff. But, generally speaking, managers are not educators; they do not know how to start instructional work. They ought to be helped in this direction by the experience of the Boston Elevated Railway this season, as described in an article in this issue. On that property, under the personal direction of General Manager Edward Dana, five series of "departmental group conferences" are being held with remarkable results as to attendance and spirit.

The plan is not radically new. That is one of its best features, as it utilizes methods that have proved out in practice. It is merely a systematizing and amplifying of conferences such as all progressive railways hold from time to time. The ELECTRIC RAILWAY JOURNAL believes that other railways would profit by following this plan as a foundation for later, more intensive, educational work.

New York Transit Situation Has Been Clarified

JUDGE MCAVOY'S report on the New York transit situation clears away the fog of misunderstanding that has existed for years. It puts the blame for the existing rapid transit status where it belongs, and it pillories the Mayor as a subject for the scorn and the contempt of his fellow citizens. Had the McAvoy report been made as the result of hearings by a legislative committee, it would not have possessed anywhere near the influence which it now has. The present Legislature of New York is Republican, and a report by a bipartisan investigating committee would have been open to the charge of bias. But the McAvoy report is by a Democratic Judge to a Democratic Governor about a Democratic Mayor, and it is a Democratic administration which is so strongly criticised in the statement just made public.

Baiting of street railways has been a popular political pastime ever since there have been such railways. The baiting has differed in degree but not in kind. In this respect the situation in New York under the Hylan régime is not unique. It is unique, however, in the ferocity of the attacks upon the companies and in the consequences that have followed to the general public in the impairment of the services rendered to them. Many other instances will occur to railway men of demagogues who have bid for popular support by attacks on local transit systems. In some of these instances, political preferment has been gained—for a time. The ultimate result, however, has always been the same—final acceptance by the public at large that oppression of its transportation utility is a public injury. When that fact comes to be realized, the rejection of the politician who advocates persecution follows quickly. This is the result that may reasonably be expected to follow in the wake of the so-called McAvoy report in regard to the responsibility for the failure to

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supply transit relief. In fact, this is the result that will follow in New York City unless that city is politically degenerate beyond belief.

McAvoy Report Is Essentially Constructive

SO MUCH for the political aspects of the matter. There is, however, an entirely different side to the report. This is the constructive side. The judge's duty was, of course, to fix the responsibility. This he certainly has done, but in so doing he has found it expedient to make suggestions for the future. They are necessarily a by-product, but they are significant. Many of these suggestions have for their purpose the correction of things obvious even to the casual observer. Now the weight of unbiased authority has been added to them. The constructive recommendations include suggestions that the 14th Street and the Ashland Place link should be completed by the city with all possible speed; that subway platforms be lengthened to accommodate 10-car trains on the Interborough and eight-car trains on the Brooklyn-Manhattan system; that the Nassau Street loop be built at once; that more trains be run in the non-rush hours, and that more guards be employed in train operation. These are only some of the things. For many of them the railways have been persistent advocates. Very few of them are within the powers of the companies to correct themselves without the co-operation of the city. As for the suggestion of additional guards, there is no benefit to any one in having a train overmanned. Reduced service in non-rush hours was imposed largely by the lack of shop facilities.

But all the shortcomings for which the companies can reasonably be held to be accountable are insignificant compared with the indictment of the Mayor and the Board of Estimate for their repeated and persistent refusals to validate new routes and to approve construction contracts and by so doing frustrate provisions for increasing transit facilities. On the very few counts made against them the railways have now obtained a clear-cut statement of how the matter appears to the unbiased outsider. They will miss a great opportunity if they do not set to work at once to correct these minor omissions and then do not capitalize the improvement by going before the public and making it plain to it wherein they have sought to do their part. It is a fact that the Transit Commission and the companies themselves were not held to be entirely blameless, but as the New York *Times* has so aptly pointed out, all the things for which they are held to be remiss are only trifles compared with the way in which Mayor Hylan has thrown himself athwart rapid transit progress. As for the Mayor's pet schemes of bus operation and the construction of the freight tunnel to Staten Island, they are both severely condemned by Judge McAvoy as now sought to be carried out.

Possibilities of broad relief for the future remain to be determined. An extension of the city's borrowing powers for the construction of additional subways, even if such a measure had smooth sailing, would take several years, and if the city had this additional borrowing power it might easily devote the money to the recapture of the existing lines. In that case the public, with municipal operation, would undoubtedly be far worse off as regards transit than at present. The precedent in other cities indicates that the logical step is some form of fare increase to attract capital, but no one in public office yet has dared to indorse such a plan. Until some one in authority has the courage to advocate that the lines be placed on a self-supporting basis, the outlook for any great expansion of New York's rapid transit systems is poor.

Specifying $10,000,000 Purchases of Special Trackwork

THE use of standard specifications for the purchase of materials has taken great strides in the last decade. The work of such bodies as the American Society for Testing Materials, the American Railway Engineering Association and the American Electric Railway Engineering Association in the preparation of specifications for various materials has had a marked influence in propagating the use of standard specifications.

Such specifications, if adequate, are of benefit both to seller and purchaser. There is little need to emphasize this. But there may well be a need for pointing out to the industry that it will be amply repaid if it will see to it that those charged with the purchase of special trackwork shall apply the several specifications of the Engineering Association covering their requirements.

To a certain extent, it appears, the method of specification at present consists in telling some manufacturer that a crossover, for instance, is wanted, made of girder rail and of hard center construction and that it is needed "yesterday." The manufacturer is left to his own devices as to many important details. It is a tribute to him to say that he usually furnishes satisfactory material, largely on his honor.

Without adequate, verified data but with some study given the subject, it is judged that the industry normally purchases special trackwork renewals to the value of more than $10,000,000 yearly. If this purchase were all made by one company the standard specifications certainly would be applied and the material would also be most carefully inspected at the mill.

It was to cover the diversified purchases by many companies that the Engineering Association adopted its special trackwork specifications. When the aggregate of individual purchases is contemplated, there can be no doubt as to the wisdom of making purchases under them.

The matter of inspection, however, is rather difficult since competent service by inspecting firms is believed to be somewhat rare. This may be due, in large measure, to the quite general failure of the industry to require shop inspection of special work before shipment. A reasonable demand for such service would soon develop a reliable supply, and some recent observations indicate the growth of a real need for adequate shop inspection. The word adequate is used advisedly. No shop will object to competent inspection, but the incompetent work of an inspector is justly disliked by the producer and, in the end, is apt to react against the purchaser. No inspection can be adequate without proper specifications. The latter are available and the industry should see that they are used. The former is available to some extent, and fair, adequate inspection services can be developed, once the need is apparent.

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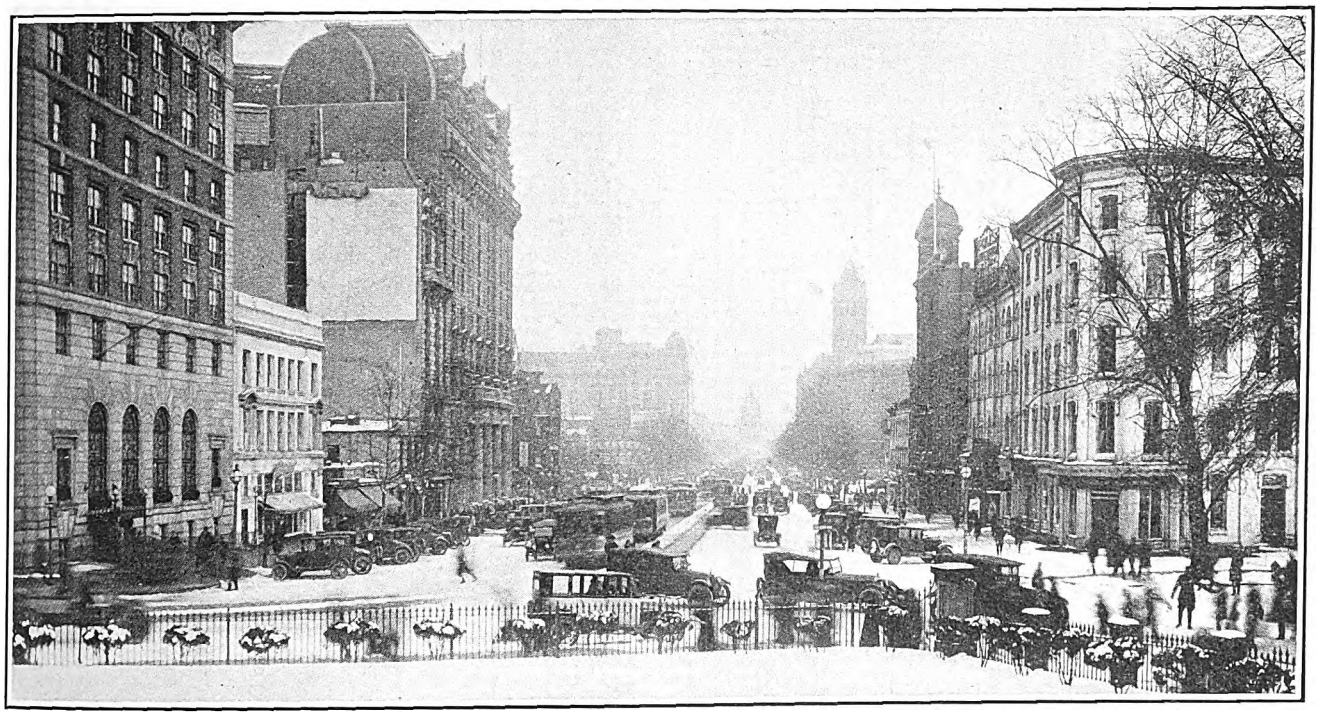
Transporting Workers in Washington

Sharp Traffic Peaks Caused by the Simultaneous Opening and Closing of Many Government Offices Are a Serious Problem—Long-Haul Business Has Been Increasing with the Expansion of the City—Buses Are Used Extensively in Outlying Districts

By John A. Miller, Jr.
Associate Editor ELECTRIC RAILWAY JOURNAL



When the Employees Are Leaving the Government Offices at 4:30 P.M. a 20-Second Headway Is Required on Pennsylvania Avenue to Handle the Traffic

ELECTRIC railway operation in the city of Washington is carried on under conditions that differ in many respects from those encountered elsewhere in the United States. Washington, which now is co-extensive with the District of Columbia, is not an industrial city, nor is it to any considerable extent a commercial city. Its chief activities are all connected with the federal government. It is said that approximately 90 per cent of the people using the street railways in the District are government employees. As nearly all of the governmental offices open simultaneously at 9 o'clock and close at 4:30, two extremely sharp traffic peaks are produced. The sharpness of the peaks is accentuated by the lack of early morning and late afternoon industrial workers.

Washington, being the capital city and attracting many visitors, is one of the show places of the entire country. Constant effort is being made to beautify it, and the railways spare no expense to conform to all plans for civic improvement. To eliminate poles and wires from the streets the underground conduit system is in use in the central portion of the city in preference to the overhead trolley. This, of course, makes construction and maintenance more expensive for the railways.

On the other hand, according to President Coolidge's recent statement at the budget meeting the average salary of government employees is something less than $1,800 a year. Although this may necessitate many of these people riding in street cars instead of in their own automobiles, it also causes them to favor the lowest possible street car fare. The problem of the companies, therefore, is to keep the quality of service as high as is demanded by the special situation in Washington, while keeping the rate of fare down to a minimum.

A third unusual phase of the railway situation in Washington is the existence of two large independent companies. The Washington Railway & Electric Company, with about 500 passenger cars and approximately 173 miles of track, is somewhat larger than the Capital Traction Company, which operates 350 cars on about 64 miles of track. The annual gross revenue of the latter is slightly under $5,000,000, while that of the former is about 30 per cent larger. Both companies are engaged in bus operation, but the activities of the Washington Railway & Electric Company are at present somewhat the more extensive. Three other electric railways connect Washington with surrounding towns, but they fill no important rôle in local transportation.

CAPITAL TRACTION COMPANY HANDLES MUCH SHORT-HAUL TRAFFIC

Speaking generally, the Capital Traction Company has been carrying more short-haul traffic and has been faced by a more serious problem of rush-hour congestion than has the Washington Railway & Electric Company. The principal lines of the former are on 14th

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Street and Pennsylvania Avenue. The routes are shown in detail on the accompanying map.

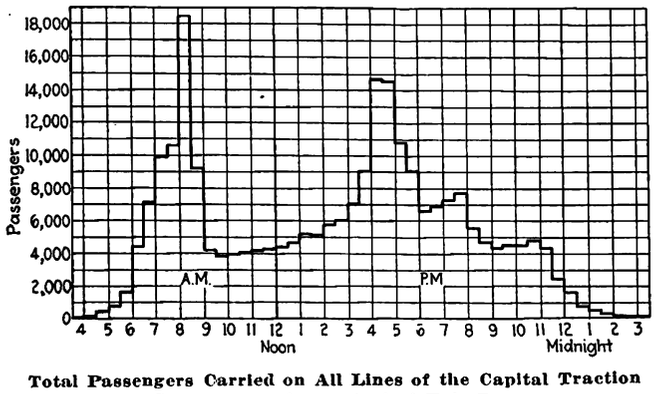
Probably the point of most serious traffic congestion in the city is the intersection of Pennsylvania and New York Avenues at 15th Street. Through this bottle neck the Capital Traction Company operates the greater part of its service. At this point the 14th Street and the Pennsylvania Avenue routes of the Capital Traction Company join. Pennsylvania Avenue is no longer the principal traffic artery on the system. Fourteenth Street has for several years exceeded it in volume of business and in cars operated. A good idea of the serious congestion may be obtained from the accompanying table which shows the traffic carried on southbound cars passing 14th and K Streets during the morning rush.

TRAFFIC READINGS—MORNING RUSH, SOUTHBOUND
Location: 14th and K Sts., N. W.

Period Beginning A. M.	Passengers				Carrying Value				Cars			
	First Day	Second Day	Third Day	Average	First Day	Second Day	Third Day	Average	First Day	Second Day	Third Day	Average
6.30	202	264	249	238	377	433	433	414	6	7	7	6.7
6.45	255	245	248	249	417	426	426	423	7	7	7	7.0
7.00	360	289	259	303	489	426	425	447	8	7	7	7.3
7.15	385	369	426	393	480	491	556	509	8	8	9	8.3
7.30	470	503	458	477	547	610	547	568	9	10	9	9.3
7.45	581	566	563	570	749	751	749	750	12	12	12	12.0
8.00	917	786	918	874	1,131	1,012	1,140	1,094	18	16	18	17.3
8.15	1,630	1,817	1,659	1,702	1,703	2,057	1,927	1,896	28	34	32	31.3
8.30	2,128	2,293	2,239	2,220	2,546	2,554	2,449	2,516	43	44	42	43.0
8.45	1,501	1,319	1,434	1,418	1,710	1,382	1,565	1,552	29	23	26	26.0
9.00	536	582	576	565	679	726	724	710	11	12	12	11.7
9.15	401	341	386	376	948	1,015	958	974	16	17	16	16.3
Total.	9,366	9,374	9,415	....	11,771	11,883	11,899	.....	195	197	197	.....
Avge.	....	....	....	9,385	.....	.....	.....	11,851	...	...	...	196.3

Weather—First day, clear; second day. cloudy; third day, cloudy.

An interesting point in this connection is that the morning peak on the lines of the Capital Traction Company is more severe than that in the afternoon. This is accounted for in large measure by the fact that the government employees must get to work promptly and they all move simultaneously toward the central part of the city where most of the offices are located. They are in less haste to return home and are likely to do some shopping on the way.



Total Passengers Carried on All Lines of the Capital Traction Company During a Typical Fair Day

Traffic checks are taken several times a year by the time-table department of the railway and the Public Utilities Commission in order properly to adjust service to actual conditions. In parallel columns in the table are shown by 15-minute periods the passengers carried on three successive days and the carrying value of the cars passing the point where the check was taken. This carrying value is established by the Public Utilities Commission on the basis of 125 seats per 100 passengers in the non-rush hours, and during the rush hour 100 passengers per 100 seats plus 1 passenger for every 7 sq.ft. of standing area in the car. From the point of view of passenger comfort, this ruling is liberal. It is claimed, however, that to insure seats for all, when the passengers present themselves at irregular times, more seats must be provided than for the actual number of people carried in the cars. It may be noted that the average carrying value in every 15-minute period of the check tabulated here was greater than the average number of passengers on the cars during this period.

Illustrating the severity of the peak condition, throughout the day the average number of cars passing 14th and K Streets in a 15-minute period is fewer than 10, whereas during the maximum period shown in the table it was 43. That means an average headway of approximately 20 seconds. When a United States Senator recently complained of inadequate service on 14th Street, it was pointed out that the present service practically equals the track capacity during the rush hour. In fact, it is said that on account of the continuous stream of cars going north and south there is hardly sufficient time for the movement of east and west traffic. The headways on Pennsylvania Avenue are nearly as short as those on 14th Street. An accompanying illustration shows the afternoon rush-hour condition on the avenue at the time when the government workers are leaving their offices on their way home. Traffic congestion on Pennsylvania Avenue itself is not particularly bad, as the street is straight and wide between the Capitol and the Treasury. But where the stream of cars meets those from west of the White House and those from 14th Street the congestion is extreme. In fact, it is only because of a special handling of vehicle traffic at 15th Street and New York Avenue that the street cars can be moved without interruption. The wye intersection of the tracks has been roped off so that vehicles cannot enter upon or cross them at this point. Vehicles can proceed east or west, but through traffic on 15th Street is prohibited. Even with this assistance careful supervision is required to get the cars through the intersection without delay. Considerable improvement was effected some little time ago by the relocation of stops and the installation of loading platforms as recommended by John A. Beeler, consulting engineer.

In order to accommodate the people with through service of the kind they have been taught to expect, a very complicated system of interlocking schedules is in effect on the lines of the Capital Traction Company. For example, the time-table specifies that alternate cars going in the direction of Georgetown shall cross the new bridge over the Potomac River to Rosslyn while the rest go to 36th and M Streets, the old terminal. Similarly on 14th Street the schedule distributes outbound cars among five different terminals. A sample headway sheet for use by a street inspector and reproduced here shows the same thing.

Uniform Equipment Facilitates Routing

The Capital Traction Company is fortunate in having rolling stock that is almost uniform. A standard double-truck, double-end, two-man car was adopted some

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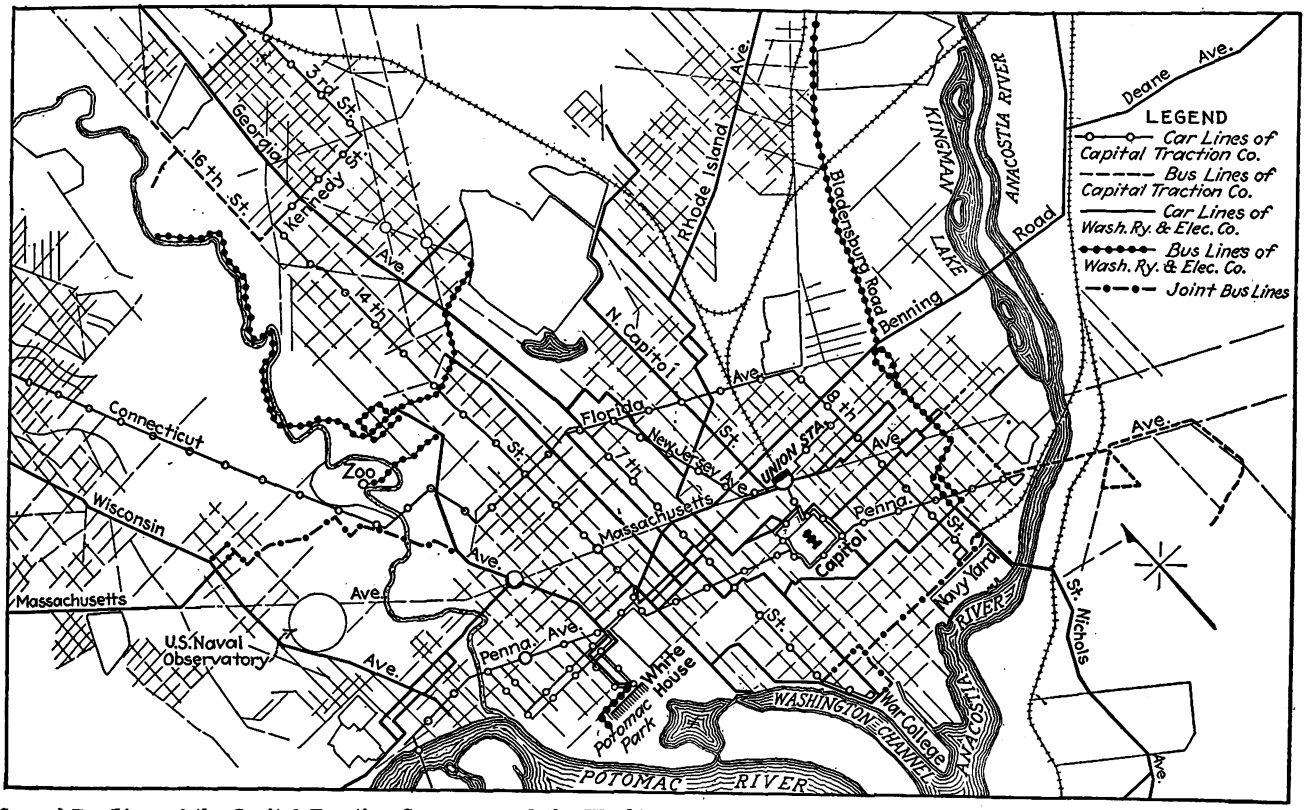


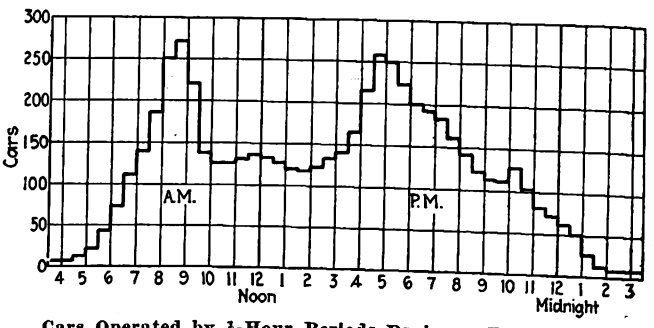
Car and Bus Lines of the Capital Traction Company and the Washington Railway & Electric Company Do Not Duplicate Each Other's Service to Any Considerable Extent. Two Bus Lines Are Jointly Operated

time ago. Except for minor changes this design has been followed in recent purchases. That the cars are so nearly alike is a great help to the time-table department, which is thereby enabled to combine trips from one section of the city with trips to any other section on the same run, and without the necessity of giving special consideration to the type of car. In this connection the roller signs have been arranged to display all destinations on the system.

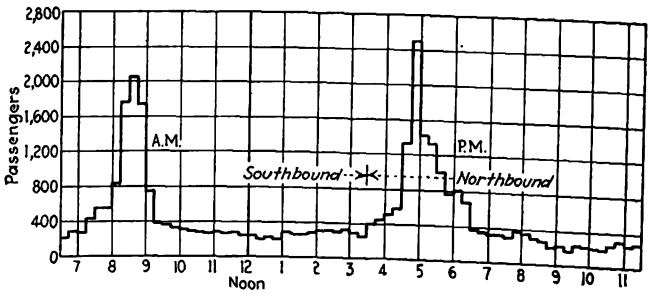
Every effort is made to have the cars attractive in appearance both inside and out. Even in the latest design of car the monitor roof has been retained because the management feels that there is a certain psychological advantage in making it possible for the passenger actually to see the open ventilators. It is thought that this is largely lost with the arch roof and inconspicuous ventilators. All cars have electric heat. Thermostatic control has recently been installed. Another improvement has been the removal of fenders. At one time a city ordinance required both fenders and life guards, but now the fenders have been done away with and only the life guards are used.

For nearly 30 years the Capital Traction cars have been painted the same color. Variations have occurred in striping and painting of the window posts, etc., but the bright green body color has remained unchanged. An interesting feature of the policy of this company is that there is no definite date when a car is sent to the shop and entirely repainted. On the contrary, small defects are repaired as soon as they are noticed and painting is done whenever and wherever it is needed. Every car is, however, entirely revarnished once a year. A recent change in the headlining color from the former greenish tone to an ivory white has improved the interior appearance. The wood trim is rubbed down and left with a dull finish. This rubbing down is thought to be important because it removes the effect of extreme newness. A passenger does not feel when he gets into a car that has been recently revarnished inside that it is fresh from the paint shop; it simply looks neat and clean and like the other cars of the company.

To reduce the noise of operation the Capital Traction Company is using helical gears with Westinghouse 514-C ventilated motors and American Electric Railway Engineering Association standard axle and journal box assembly. These gears have been in use since 1919 and it is believed by the company's engineers that they are as quiet today as when they were new. Old spur gears are being replaced by helical gears as rapidly as



Cars Operated by ½-Hour Periods During a Typical Day



Traffic Curve at 14th and K Streets

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they wear out. The management of this company believes that the helical gears show less wear under the difficult service conditions in Washington than do the spur gears.

Another step which the company has taken in the direction of noise elimination is the use of seam and thermit welded rail joints. The underground conduit construction which is used in Washington has a tendency to exaggerate the noise of car operation, and great care must therefore be taken to eliminate as much rattle and bang as possible. In 1909 this company adopted a standard type of track construction using A.E.R.E.A. 7-in., 122-lb. grooved girder rail, and has adhered to it ever since.

WASHINGTON RAILWAY & ELECTRIC COMPANY OPERATES MANY LONG LINES

The traffic situation facing the Washington Railway & Electric Company differs in many respects from that of the Capital Traction Company. The first-mentioned railway has many long lines where, in the past, the riding has been comparatively light, and which have been operated at a loss.

The remarkable growth of the city during and since the war has resulted in a shifting of the center of population and business to the west and north. New centers have sprung up in the outlying portions of the District and in Maryland, where the Washington Railway & Electric has been running cars for years through sparsely settled territory. Business has shifted to some extent from the lower streets of the city and has invaded sections that were previously strictly residential. This has brought increased traffic to the company, but despite such expansion the traffic density is considerably less than that on the lines of the Capital Traction Company.

Routes of the Washington Railway & Electric Company run out through Georgetown and along the Potomac River to Cabin John Bridge, far out Massachusetts and Wisconsin Avenues to Rockville, north to Forest Glen, and also northeast to Laurel and East Riverdale, Maryland.

Southbound on 14th Street in A.M. Rush — Weekday — 1-19-25

Run No.	Takoma	14th & Colo.	14th & Dec.	14th & Park	14th & U Sts.	For	
272	—	8-08[2]	8-11	8-17	8-22[2]	U.Sta	o
291	—	—	—	8-17[2]	8-23	P.P.	
73	—	—	8-11[2]	8-17[2]	8-23	P.Mt.	
5	—	—	8-12	8-18	8-23[2]	8 & F	o
16	—	—	8-12	8-18[2]	8-23[2]	U.Sta.	
274	—	8-10	8-12[2]	8-18[2]	8-24	Gtn.	
522	—	—	—	8-19	8-24[2]	N.Yd.	
67	Train	—	8-13	8-19	8-24[2]	P.P.	o
64	—	—	8-13[2]	8-19[2]	8-25	U.Sta.	
292	—	—	—	8-20	8-25[2]	26 & G	
239	—	—	8-15[2]	8-21[2]	8-27	P.P.	
58	—	8-13[2]	8-16	8-22	8-27[2]	N.Yd.	
259	—	—	—	8-22[2]	8-28	P.P.	
40	—	—	8-17	8-23	8-28[2]	C & L	
43	Und-wd 8-02	8-14[2]	8-17	8-23	8-28[2]	U.Sta.	o
252	—	—	8-17[2]	8-23[2]	8-29	P.Mt.	
543	—	—	—	8-24	8-29[2]	N.Yd.	
404	7-59	8-15[2]	8-18	8-24	8-29[2]	N.Yd.	o
293	—	—	—	8-24[2]	8-30	U.Sta.	
268	—	8-16	8-18[2]	8-24[2]	8-30	U.Sta.	
7	—	—	8-19	8-25	8-30[2]	P.P.	
6	—	8-17	8-19[2]	8-25[2]	8-31	8 & F	o
266	—	—	—	8-26	8-31[2]	Ross	
51	8-02	8-18	8-20[2]	8-24[2]	8-32	N.Yd.	
544	—	—	8-21	8-27	8-32[2]	N.Yd.	

Street Inspectors' Headway Sheet

U Sta = Union Station
P P = Potomac Park
P Mt = Peace Monument
8 & F = Eighth and F Streets
Gtn = Georgetown
N Yd = Navy Yard
26 & G = Twenty-sixth and G Streets
C & L = Capitol and Library
Und-wd = Underwood
Ross = Rosslyn

Because traffic is light on a number of the company's lines one-man cars are used to good advantage. Experiments have been made with automatic rear-exit doors on two of such cars, as told in this paper for Aug. 30, 1924. To differentiate them from the other one-man cars, the dashers of the automatic-door cars have been painted yellow. Some objection has been made to the operation of street cars in Washington by only one man and the whole subject is under general discussion.

Not all of the lines, however, are light-traffic suburban routes. The Mount Pleasant line operates out Connecticut Avenue to Columbia Heights through one of the most rapidly growing portions of the city and has extremely heavy riding. Moreover, the character of the population in this section is such that scrupulous attention must be paid at all times to the quality of service. When snowstorms occur, as happens occasionally in Washington, this is one of the first lines on which the railway operates its plows and sweepers. In spite of the unusually difficult weather conditions the present winter, with snowstorms that were said to be of greater severity than occurred for many years, all the city lines were kept open. Riding on the Ninth Street line is also very heavy now due to the increase in population in the Georgia Avenue neighborhood.

In May, 1922, the Washington Railway & Electric Company first undertook bus operation on a line between Mount Pleasant and Petworth connecting three of its car lines, Mount Pleasant, 11th Street and Georgia Avenue. Since that time the company has added bus service to Rock Creek Park, to Potomac Park, in the eastern portion of the city to serve the new Eastern High School and at the terminus of its Congress Heights line in Maryland. Rail service on Bladensburg Road to Riverdale has been replaced by bus service with the consent of the people there and with the approval of the Public Service Commission of Maryland. The Washington Railway & Electric Company is at present operating 23 buses. Permission has been asked to operate on a new crosstown line. If the permit is granted the company plans to purchase five new six-wheel buses to operate on this route.

BOTH COMPANIES ARE USING BUSES

Two bus lines are operated jointly by the Washington Railway & Electric Company and the Capital Traction Company. These are the Woodley Road and Southwest routes. No boulevard bus service is now being operated by either railway. A service having some such characteristics, however, is operated on 16th Street by an independent concern, the Washington Rapid Transit Company. The Capital Traction Company has a number of feeder lines of its own in addition to the joint routes. The locations of the various bus lines are shown on the acompanying map.

Efforts are being made in certain quarters to have all future bus operation under separate control rather than in the hands of the railways. This issue is acute at the moment in connection with a proposed crosstown bus line. Both the Rapid Transit company and the Washington Railway & Electric Company desire to operate this route. It is thought by experienced transportation men that separate control of bus and railway service in Washington would be particularly undesirable because of the sharpness of the traffic peaks already described. The number of passengers to be carried during the rush hour is so much greater than during the rest of the day that none but a large and well-organized transportation agency could possibly provide adequate facilities. Buses under the control of the railways and operated in conjunction with their cars are much more likely to fit in with the general transportation system than are privately owned buses. The agitation in favor of separate ownership, therefore, appears to be a move in the wrong direction.

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Efforts have been made from time to time, not only by local people but by Congress, to compel the amalgamation of the Capital Traction Company and the Washington Railway & Electric Company into a single organization. Just at present such a combination is definitely forbidden by law, but a bill is under consideration in Congress to permit a voluntary merger. It is proposed, moreover, by some of those who favor amalgamation, that the companies should be forced to combine if they fail to take advantage of the permission contained in the proposed bill.

Just how much good would result from a combination is problematical. It has been said that transfer facilities would be improved and operating economies made possible. There is undoubtedly some merit in the first of these contentions. As to the second, it would be possible to make operating economies now if the railways were permitted to reroute their cars and discontinue some of the more complicated through trips which they now make. The public, however, is opposed to any such plan now and probably would be opposed to a similar plan resulting from the combination of the companies.

At present there is little duplication of service by the two companies. In fact, the 16th Street bus line of the Washington Rapid Transit Company is a more outstanding example of duplication of service than can be found on the railways in Washington. It is curious that the people who appear strongly to favor combination of the railways favor also the separation of control of the railway and bus systems.

Headway Recorders Show Crossing Delays

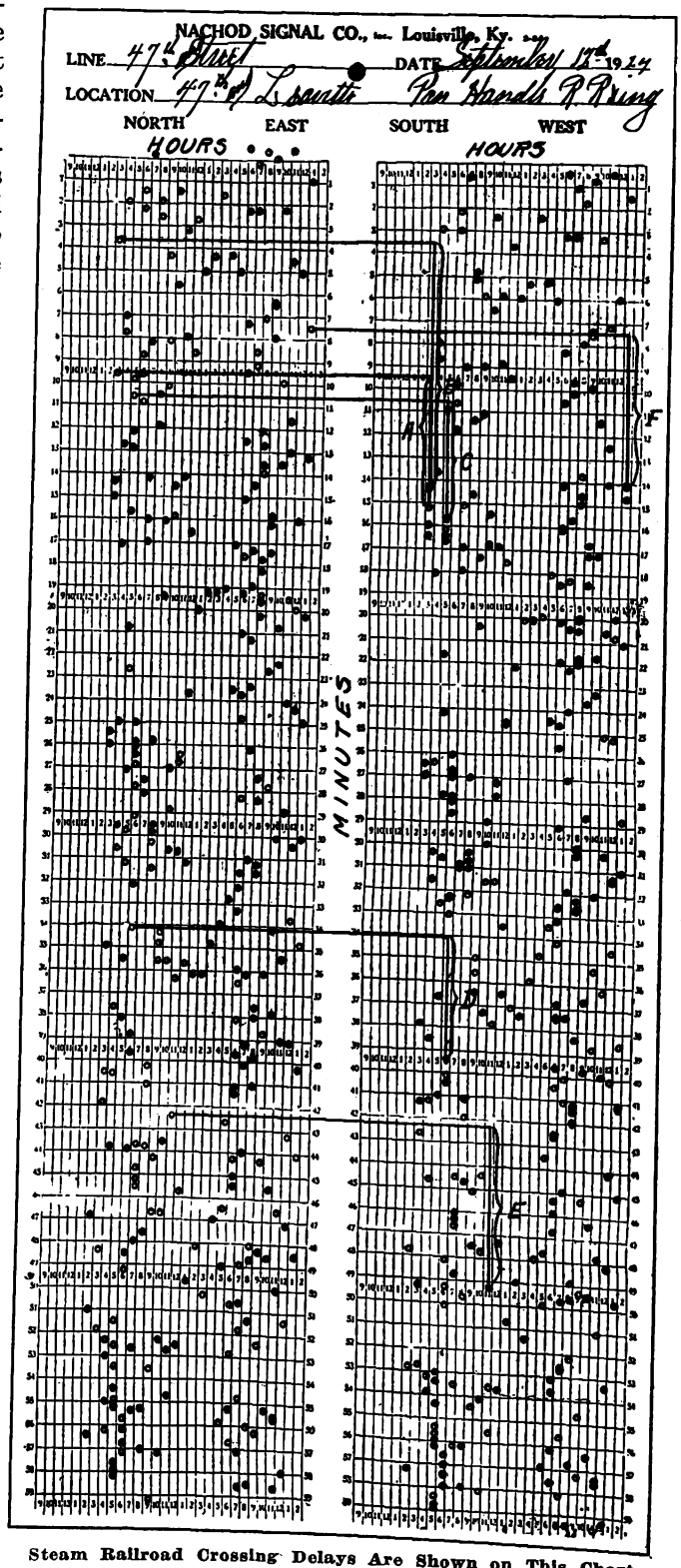
The Time of Each Car Is Indicated at Points on Both Sides of the Railroad Right-of-Way, and Any Delays Due to Blockades Are Thus Indicated

AN INTERESTING use of Nachod headway recorders is that on the Chicago Surface Lines for checking delays to street car service caused by blockades at steam railroad crossings. A time limit for railroad switching operations at crossings has been established by city ordinances. The recorders are used to make a permanent record of the time taken by each car in getting across the railroad right-of-way, and the exact time and duration of delays are thus brought to light.

The form of record obtained is shown in the accompanying illustration. This chart is divided into two parts, on one of which is indicated the time on one side of the crossing, while the second gives the time on the other side. The instrument is mounted on one track only of a double-track line, it being assumed that any serious delay will show up in the record obtained for the one track.

Heavy black lines have been drawn horizontally, and the time intervals in minutes, where delays occurred, are shown by brackets, marked *A*, *B*, *C*, etc. The delay marked *E* will serve as an illustration of the use of the chart. In this case a car arrived at the east side of the crossing at the time indicated by the small circle on the extreme left end of the heavy horizontal line. The vertical column indicates that this was during the hour of 11 and the horizontal lines show the time to be slightly less than 11:42½. The first circle in the corresponding vertical column on the right side of the chart, after 11:42½, gives the time this car arrived on the opposite side of the crossing. As shown on the chart at the bottom of the bracket *E*, this was at about 11:49¼, indicating a delay at the crossing of approximately 6¾ minutes. The other brackets on the chart indicate delays of various durations to other cars at this crossing.

When these charts are checked in the office, a template is used to simplify reading, and the long delays are picked off quickly by a clerk. These delays are then made up in the form of a report and are brought to the attention of the offending railroad companies.



Steam Railroad Crossing Delays Are Shown on This Chart Made by a Nachod Headway Recorder

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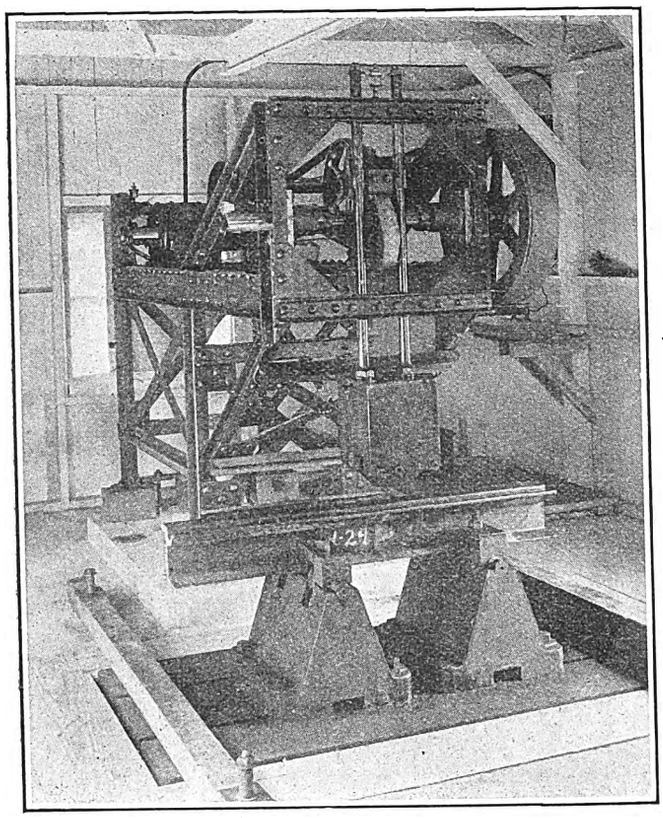
Repeated Impact Tests Are Progressing

FOR some time past, a repeated impact testing machine has been at work under the auspices of the committee on welded rail joints of the American Electric Railway Engineering Association and the American Welding Society, making tests of various types of rail joints at the Bureau of Standards, on Connecticut Avenue, Washington, D. C. Bending drop and tensile tests of joints specially prepared by various way engineers throughout the country have already been made, as told in previous articles in this paper. Similar joints are now being tested in the repeated impact machine.

This apparatus consists essentially of a 400-lb. weight which drops a distance of 6 in. onto the rail joint. In conducting the test it has been the practice to have



In Making Repeated Impact Tests This 400-Lb. Weight Is Dropped 70 Times per Minute on the Rail Joint 6 In. Below

the weight strike about 2 in. away from the rail joint, simulating the condition that exists with a low joint in track. This weight is raised and dropped 65 to 75 times a minute. The joint itself rests on two supports about 22 in. apart, which are bolted down to a heavy cast-iron platform or anvil supported by springs. Special devices dampen the vibrations of the springs so that the anvil comes to rest between blows. The anvil weighs about 16,000 lb. and this mass is so great that the exact arrangement of springs underneath is immaterial, because the force of the blow is almost entirely dissipated before it reaches the spring.

No definite relationship has been established between the number of blows of the machine required to cause failure of a joint and the number of car passes which the same joint would stand. Inasmuch as many joints have failed in these experiments at between 150,000 and 200,000 blows, it is evident that the blow of the machine is more severe than that which would ordinarily be encountered in actual service except with seriously defective joints such as are simulated by the machine. When designing the machine to determine how great the blow is with a low joint, lead inserts were installed in track actually in service and the compression caused by the passage of a car was measured. Experiments showed that a force of approximately 200 ft.-lb. was necessary to cause this amount of compression, and this force was therefore used in the testing machine.

Definite conclusions from the repeated impact experiments are not yet possible because the joints so far tested have been of two types only. Experiments are being carried out under the direction of Prof. H. L. Whittemore of the Bureau of Standards. Approximately one-fifth of the total number of joints have already been tested. It is hoped that by the end of the summer the tests will have been completed and the results will be available for publication to the electric railway industry.

Honor Roll Reduces Accidents in Dayton

THE City Railway of Dayton, Ohio, has established an honor roll among platform employees for freedom from accidents. In order to offer some form of reward for honor roll membership, each man whose name is put on the coveted list is given one day off a month with pay.

As now practiced, the rules call for freedom from accidents due in any form to the operator's negligence, where the company would be liable for injury or damage to property. When an operator has a clear record for a period of 3 months his name goes on the honor roll and he is entitled to one day off with pay, provided that he has worked at least 20 days during the month. After a man's name is once put on the list it stays there as long as he continues to be free of chargeable accidents. The names of approximately 80 per cent to 90 per cent of all platform employees are on the list each month.

At the end of December, 1924, 44 platform employees out of a total of approximately 110 were found to be free of chargeable accidents for the entire year. These men were surprised with a cash bonus of $25 at Christmas time as a reward for the unusual care exercised in their work.

COMPARATIVE ACCIDENT FIGURES FOR DECEMBER, 1924, CITY RAILWAY OF DAYTON, OHIO

Division	Number of Accidents Chargeable	Other	Figures per Chargeable Accident Passengers	Car-Miles
First	1	23	569,221	67,408.4
Second	4	18	152,639	16,729.4
Third	0	24	407,566*	46,425.9*
Fourth	1	21	368,956	50,689.1

* Total figures. Ratio infinite.

Another feature of the accident prevention work of the company is an honorary banner which is hung in the division having the best record at the end of each month from the standpoint of accident prevention. This banner is highly prized and results in each man being held personally responsible by his co-workers for accidents that affect the standing of the various divisions.

The accompanying table gives a comparison of accidents for each of the four divisions during the month of December, 1924.

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Mayor Hylan Held Responsible for New York's Subway Ills

Governor Smith's Special Commission Criticises Board of Estimate, but Exonerates Members of New York Transit Commission—Urges Completion of Existing Lines with Shop and Yard Facilities—Demand for Larger Borrowing Capacity for City Approved

THE members of the New York Transit Commission are not chargeable with the failure to build the much needed new subway lines or extend the existing subways. The repeated and persistent refusals of the Mayor and other members of the Board of Estimate of New York City to adopt proposals for the validation of new routes and to approve contracts for construction of routes already validated or provided for in the dual contracts of 1913 completely frustrated provision for increased transit facilities. The charges made by the Mayor and the Board of Estimate against the commission are without foundation and no cause exists for the removal of the commissioners from office.

These are the principal findings made public on Feb. 9 by Justice John V. McAvoy, appointed by Governor Smith to inquire into the transit situation in New York City. Each of the eleven counts is dismissed with a statement that sufficient evidence was not presented at the public hearings before the justice to sustain the charges. The justice reached his conclusions without qualification or equivocation. His report is a concise statement of fact without flourish or adornment. The justice has dismissed the question of fare as not involved in the controversy. He did say, however, that a statute could be agreed to between the Governor and the Legislature, which would provide that the rate of fare should be 7 cents on the rapid transit lines and that the first cent above 5 cents should be paid into the city treasury monthly and the remaining cent be impounded so that the operating companies would be prevented from receiving any greater return than a fixed amount.

The one point on which Justice McAvoy fails to sustain the views of the Transit Commissioners is in his recommendation for legislation to take away their power to modify contracts with the railroad companies without the consent of the city. The commission has announced that it would not seek to exercise this power except in connection with its proposed readjustment plan for the unification of the transit companies into a single system. Justice McAvoy indicates that he considers this plan impracticable at present and declares that the absence of a provision to give the city final authority as to the lines to be included in such a system constitutes an "insuperable barrier" to its adoption without considering any of the other possible objections that might be raised.

As the justice sees it the pressing necessity of the transit situation "called for co-operation between the Transit Commission and the Board of Estimate, and the rejection of contracts without any assigned good reason or because of hostility to the Transit Commission, which under the law was the only body which could propose them, is indefensible. Obviously, it would only prevent the building of new subways which were needed so acutely."

Subway routes which must be rushed to completion and which should have been finished long ago, had there been co-operation instead of antagonism on the part of the Board of Estimate, include the 14th Street line, the Nassau-Broad Street line, extension of the Queensboro line, the Washington Heights line, and making the West Side subway north of 96th Street into a four-track route. More cars can be run in non-rush hours, Justice McAvoy states.

The justice reaches no conclusion as to whether or not the city's proposed independent subway system can be made self-supporting at present construction costs on a 5-cent fare. Saying that the 5-cent fare in the existing subways is unalterably fixed by contracts, and that the fare in the proposed municipal subway is fixed by statute at the same rate for the first 3 years, Justice McAvoy holds that the 5-cent fare issue does not now arise and that no anticipatory conclusion should be reached in advance of an estimate of the probable results of the operation of the proposed new lines by the Board of Transportation.

Justice McAvoy declares that the present municipally supervised system of bus operation is illegal and asserts that the city should compel the present individual bus operators to apply for franchises and certificates, with payment of a percentage of their receipts to the city, until the power of the municipality to operate buses is established by decision of the courts or by new legislation.

He also condemns the proposed Staten Island combined freight and passenger tunnel favored by the Hylan administration, and declares that the plans should be changed at once to a rapid transit tunnel, which can be built at much less cost, and that the present mandatory act for the construction of a combined freight and passenger tunnel should be amended.

From the

New York World

THE findings are a detailed and unqualified condemnation of the Mayor's whole transit record. Unless Governor Smith rejects them the Democracy of New York cannot consider any longer the renomination of John F. Hylan.

To renominate Mayor Hylan would be to indorse him. To indorse him would be to make the whole Democratic party responsible for the indefensible record of the Hylan-Hearst faction. There is no escape from this conclusion. It is the very heart of the McAvoy report. With this report in existence, the Democratic party of New York must either dissociate itself entirely from the Hylan record or surrender body and soul to Hylan and Hearst and go down with them. There can be no compromise on a record that is indefensible.

The independent citizens of New York realize that a Democratic Governor would never have risked the dangers to his party contained in this inquiry if the evidence were not overwhelming and beyond dispute. This is no Republican report about a Democrat. This is no "reformer's" report about a "politician." This is the report of a Tammany judge to a Tammany Governor about a Mayor of their own party.

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One point upon which Justice McAvoy sustains a contention of the city administration is his declaration for a constitutional amendment to exempt sufficient sums from the city's debt limit to provide funds for new subway construction. This, however, is the suggestion made by Comptroller Craig and not that of Mayor Hylan.

These suggestions are incidental. The main purpose of the report was to fix responsibility. The full report would cover 10 pages of space in the ELECTRIC RAILWAY JOURNAL. The attempt made here is merely to touch the high spots so far as these suggestions are contained. The justice's review and decision on the 11 allegations have been summarized as follows:

Charge 1

The first charge is substantially to the effect that the commissioners failed and neglected to perform their duty with respect to securing safe and adequate rapid transit services; in particular it is claimed that an accident happened on the elevated railroad in Brooklyn whereby two wooden cars fell to the street; that portions of the structure, in particular the guard rails and wooden ties, were defective and bolts were loose; that a device termed "dead man's button" was not installed upon the trains of that company; that under contract No. 4, wooden cars should not have been allowed to be used in trains operated upon that structure; that on July 30, 1924, a wreck occurred at the Sunnyside yard of the Long Island Railroad through the throwing by hand of a switch under a moving train, causing the derailment of the last three cars of the train; that on August 5, 1924, a wreck occurred at the Ocean Parkway station of the Brighton Beach line of the B.-M. T. system, and that the transit commissioners were guilty of negligence.

THE ANSWER

In support of this charge the Mayor's counsel urges that the transit commissioners, though in office from April 26, 1921, did not commence any public hearings into the service upon the rapid transit lines, until March 15, 1922, and that no order affecting that service was made until May and July of that year. The Transit Commission, however, did undertake the investigation of the service in November, 1921, preliminary to instituting the public hearings mentioned by the Mayor's counsel. It does not appear to me that there was any delay in making the inquiry which can fairly be criticised as amounting to a dereliction of duty.

The powers of the Transit Commission were regulatory in character, but that does not mean that the commissioners are chargeable with knowledge of each and every detail of the structure and equipment of the companies operating in this city. . . I am certain that they were not guilty of misconduct because they did not at an earlier date take the steps now urged by counsel. Upon receipt of the report of the joint board of engineers in January, 1924, as to the condition of the elevated structure in Brooklyn steps were taken to carry out the recommendations of that report.

It is erroneous to say that the structure of any of the elevated railroads in Brooklyn was found by these engineers to be "unsafe." The converse is the fact. It would indeed be surprising if structures which have borne their burden for so many years had been found to be unsafe for use. Moreover, if the city authorities had or have evidence proving that the structure was and is actually unsafe steps could have been and can still be taken by them through application to the courts to require its abatement as a public nuisance.

The accident on the Fifth Avenue line did not occur on a curve and seems to have been caused by the dropping upon the track of some portion of the car equipment, which caused a derailment, and it is difficult to see in what respect the most approved "dead man's button" would have averted that accident.

The accident in the Sunnyside yard resulted from the negligent conduct of an employee in turning a switch while a train was passing in front of him upon the track. The criticism is made that this switch should have been included in the interlocking system. There is no justification for the contention that the transit commissioners were charged with the responsibility of investigating every switch in every railroad yard to see whether it is properly controlled, in the absence of proof, as here, that the defect was one which was readily apparent or had been called to their attention.

From the

New York Herald-Tribune

THIS report is not the work of the political enemies of the Mayor. It was written after a searching examination into the cold facts by a man belonging to Mr. Hylan's own political organization, who happens to possess the honesty and the intelligence to subordinate party interests to public service. It is a pitiless and an unanswerable indictment of the Mayor's colossal failure to do the job which he promised to do in two campaigns and which the voters elected him to do.

The report is calm and dispassionate. It displays a thorough familiarity with every detail of the vast mass of testimony and exhibits submitted at the investigation, supplemented by a first-hand investigation of subway conditions.

Mr. Hylan's utter unfitness for the job which he has held for 7 years and which he hopes to hold for 4 years more stands revealed. A Governor of his own party accorded him the hearing of his charges against the Transit Commission that he so loudly demanded. A distinguished justice of his own party conducted the investigation, acquitted the Transit Commission, and fixed the responsibility for keeping the people out of subways on Mr. Hylan himself. Judge McAvoy's report ought to bring the Mayor's political career to an end.

The further contention that under contract No. 4 the wooden cars were required to be retired from service at the dates fixed in the schedule mentioned in Article XLVII of that contract, appears from a study of the contract to be fallacious. From the evidence before me it appears that these cars and their equipment were being maintained by the operating company in a serviceable condition by renewals and repairs, so that while for valuation purposes they might as a matter of contract stipulation be agreed to be worthless, when the city should exercise its right of recapture prior to the termination of the contract, nevertheless, if so maintained in good order there appears to be no reason why they should be scrapped unless all wooden car equipment is to be removed from operation. The retirement of these serviceable cars would not have aided in reducing, but would have necessarily tended to increase the congestion, due to the heavy traffic upon those lines.

Charge 2

The second charge condemns the transit commissioners for approving the reorganization of the Brooklyn Rapid Transit Company.

THE ANSWER

It is claimed that the Transit Commission, in the performance of its quasi-judicial function, approved a reorganization which it should have disapproved. The city of New York, although it took part in that proceeding, having been represented by counsel who called witnesses and presented arguments in support of its contention, did not seek to review its decision in the courts. It abided by the result. The organization was achieved. Now it criticises the determination of the Transit Commission upon the ground among others that the Transit Commission permitted an overcapitalization of the Brooklyn-Manhattan Transit Corporation because that company issued 769,911 shares of non-par value common stock.

The charge is made that after the approval by the Transit Commission, the Brooklyn-Manhattan Transit Corporation, which had been organized under the business corporation laws of the state of New York, entered upon its books the sum of $40,000,000 as the valuation of the 769,911 shares of non-par value common stock. It does not appear that the Transit Commission had any jurisdiction over the book entries of the Brooklyn-Manhattan Transit Corporation, after it approved the form of capitalization which had theretofore been approved by the United States District Court.

The prices at which the shares of that company sold in the market were not matters which fell within the scope of the Transit Commission's jur-

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isdiction, nor will the declaration of a dividend by the corporation, organized under the business corporation law, come under the Transit Commission's control.

The courts have ruled that the legislation giving public utility commissioners power to regulate the issuance of stocks and bonds of a public utility corporation was not designed to make the commissioners financial managers of the corporation, nor did it empower them to substitute their judgment for that of the board of directors or stockholders of the corporation as to the wisdom of a transaction.

Nothing has appeared to indicate that the Transit Commission did not bring to the matter the exercise of its discretion in good faith under the law.

Charge 3

The third charge embodies a claim that the Transit Commission was negligent in failing to require the operation of sufficient railroad cars and adequate train crews and their equipment by the companies operating under contracts Nos. 3 and 4, and that as a result the traveling public, especially during the rush hours, received inadequate and insufficient accommodation and were crowded into the cars beyond their capacity.

THE ANSWER

That there is and has been an intolerable overcrowding of passengers, both upon the stations and upon the cars of the operating companies, is of course admitted by everyone. That the companies appear to be operating substantially all of the trains which could with safety be accommodated on existing lines during the so-called rush hours was conceded by the Mayor in the written memorandum which he submitted upon the hearing. There are points of congestion upon the trunk lines through which no more trains can be safely operated during the rush hours, and naturally the outlying districts through which these rush-hour trains are distributed suffer from an inadequate number of trains. Obviously this situation could have been alleviated by the employment of more cars, provided the inspection and shop facilities had been adequate for the proper maintenance of a greater number of cars than were in service. With the completion of all the required shop and inspection facilities additional cars ought to be required. There is no evidence tending to show that the transit commissioners have been neglectful of their duty in this respect.

Charges 4 and 5

Charges 4 and 5 may be grouped, inasmuch as both relate to the alleged failure of the commission to enforce the provisions of the dual contracts with respect to depreciation.

THE ANSWER

Contract No. 3 provides that from the pooled revenue there shall annually be deducted 12 per centum thereof to provide for maintenance, exclusive of depreciation. It is then further provided that for the first year of operation under the lease 5 per centum of the revenue shall be placed in a depreciation fund, and that annually, within 30 days after the 30th day of June, the commission and the lessee shall determine the amount to be paid to such fund and the classification thereof.

The precise meaning of the language of these provisions in the contract is in dispute. The city, through the Transit Commission, contends that in addition to the 12 per cent provided in paragraph 4 and such further sums as may be necessary to maintain the equipment, which sums have been denominated "excess maintenance," there is an obligation upon the company to take further sums from the annual revenue and place them in a depreciation fund. The company, on the other hand, contends that it has fully maintained the equipment and that there has been in fact no depreciation and therefore no necessity for payments due to any depreciation fund.

The Transit Commission has steadfastly adhered to the city's view of the proper construction of these provisions of contract No. 3, but has under the advice of its counsel deemed it inexpedient to press the matter to a determination at this time. The commission has not waived the city's rights, but has apparently fairly exercised its judgment and discretion, and there is nothing in its conduct which would justify the charge of malfeasance.

From the

New York Times

THE sweeping condemnation of the Mayor's course is the thing which to most eyes will stand out in Judge McAvoy's report as of chief importance. Judge McAvoy asks nobody to take his word for this. He recites and analyzes the evidence. He traces the Mayor's vacillation and obstruction step by step; showing what contracts were violated, what promises were repudiated, what official undertakings were concealed, even what orders of the court were defied. The result is a terrible arraignment, all the more death-dealing for being couched in judicial and restrained language. The whole report is, in fact, a model. It is clear without being wordy, condensed without being obscure, and marches from premises to conclusion with an irresistible sweep of logic.

The report is not an indiscriminate defense of everything that has been done by the operating companies or even by the Transit Commission. The judge thinks that the Transit Commission should have insisted upon better sanitary conditions in the subway and elevated stations. He objects to permitting the companies to cut down too sharply the force of guards on the trains. There are other minor improvements which should have been required. But all these things are only trifles compared with the way in which Mayor Hylan has thrown himself athwart rapid transit progress.

Judge McAvoy embodies in his report a constructive subway program. Its details, most of them admirable, must be left for future discussion. The great thing is that we have at last a judicial determination in regard to scandalous acts of the city administration which have too long afflicted us. The report certainly ought to be the beginning of better days for rapid transit relief. It ought also to be, if there is left in New York anything like a reasoning public, the end of Mayor Hylan politically.

Charge 6

The sixth charge is to the effect that the commissioners have not compelled the operating companies, under contracts Nos. 3 and 4, to put into the pool all the revenues derived, directly or indirectly, from the operation of the properties.

THE ANSWER

The items, specifically referred to, are sums received as rentals from cars leased to other corporations, share of joint revenues with other companies and the amounts received from interest on bank balances. It appears that the first of these items has been adjusted, and the company has acceded to the city's contention as maintained by the Transit Commission. The other two items are in course of adjustment, and the Transit Commission has steadfastly maintained the city's contention with respect thereto.

Charge 7

The seventh charge relates to the inclusion of the receivership expenses in cost of operation, under the provisions of contract No. 4, and further asserts that the transit commissioners have failed to provide adequate examination of the operating accounts of the lessees, and have failed to exclude from the cost of operation items of expense said to be improperly charged against operation under contracts Nos. 3 and 4.

THE ANSWER

The evidence shows that a fraction of the total amount of these expenses, consisting mainly of the compensation of the receiver and his counsel, were permitted to be charged against the cost of operation, being a sum about equal to what would have been the salaries of the officials of the companies, had there been no receiver. The accounting department of the Transit Commission is well organized and has performed its duties in connection with the examination of accounts.

Charge 8

The eighth charge relates to the action of the Transit Commission with respect to items in the 12th and 19th quarterly determination of costs by the engineers under contract No. 4, and the claim likewise that the Transit Commission has failed to urge objections made by its predecessor and to cause the removal of unwarranted items charged thereunder.

THE ANSWER

When the Transit Commission came into office, the disposition of these matters was 5 years in arrears, and within 9 months they were brought up to date. Subsequent determinations have been made from time to time, as appears from the volumes relating thereto, which have been introduced in evidence

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before me. There is no ground for believing that the Transit Commission has been derelict in its duty in this respect.

Charge 9

The ninth charge consists of the claim that the transit commissioners have violated their duties by creating and maintaining useless appointees in office, who were unfit for the work imposed upon them.

THE ANSWER

The Transit Commission continued to employ those who had been performing similar duties under its predecessors. Nearly all of these positions were in the classified Civil Service. The only person mentioned by the Mayor as being unfit was called before me and I found him to be a competent man who was performing his duties. A comparison of the amount expended by the Transit Commission, with that now being incurred by the two bodies, covering the entire field, with which the Transit Commission was invested under the law, prior to July 1, 1924, shows that the expenditures of the Transit Commission were less than that of the two bodies now doing the same work.

Charge 10

The tenth charge accuses the transit commissioners of failing to restore the unified service which existed prior to the receivership of the railroad companies in New York and Brooklyn, and refers in particular to the fact that the Brooklyn City Railroad is being operated independently of the B.-M. T. system of which it was formerly a part.

THE ANSWER

That railroad company became a separate unit during the B. R. T. receivership by virtue of a court order, and manifestly the Transit Commission could not as a matter of law fail to regard the determination of the United States District Court in that respect. There is no reason to believe that the transit commissioners did not act in entire good faith in connection with its consideration of this matter and there is no warrant for any finding of neglect or malfeasance.

Charge 11

The eleventh charge relates to the alleged failure to retire the wooden cars in accordance with the provisions of contract No. 4.

THE ANSWER

This charge is substantially included in the first charge and is disposed of by the views expressed by me with respect thereto.

Boston Begins Educational Program

Eight Hundred Elevated Railway Employees Meet Regularly Under "Departmental Group Conference Plan" Devised to Help Ambitious Workers Secure Best Information Available in Their Specialties—Power, Transportation, Maintenance, Shop Practice and Special Subjects for Women Included

THIS winter there is being carried out on the property of the Boston Elevated Railway a comprehensive educational program under what, for want of a shorter term, is known as a "departmental group conference plan." Five groups are holding meetings, practically each week, as follows: Rolling stock and shops; maintenance (track, elevated structures, subways, buildings, signals, etc.); power; transportation, and women of several departments. Upward of 800 employees are registered in these groups and a high percentage of attendance is being maintained.

The first step in preparing the present program was to consult a large number of representative employees who had taken courses in previous years. The unanimous desire was for an opportunity to discuss departmental problems and the principles underlying the work of the several departments.

Next, the general manager, Edward Dana, in consultation with department heads, appointed a committee on education for the property. This consists of men selected by the department heads to act as group chairmen, with the general manager as chairman of the educational committee. To the educational committee was assigned the task of preparing a program for the season. The committee asked each departmental representative to prepare a list of topics for a maximum of 20 meetings, and to plan to secure speakers to present these topics and lead the discussions. In this work the committee was assisted by Henry H. Norris of the McGraw-Hill Company staff. The schedule, as approved by the committee, is shown in the accompanying table.

The meetings, in general, are held in a large and well-equipped instruction school recently completed at the Sullivan Square terminal in Charlestown. Here there is seating capacity up to 700 persons, and the main auditorium is provided with motion and still picture projection apparatus, sound amplifiers of the latest type, radio, piano—in short, everything needed for the comfort, convenience and entertainment of the groups.

The program of each meeting is designed to run from 7:30 to 9 p.m.; a half hour each for the informal talk or series of talks, for the discussion, and for such other features as may be provided.* This is subject to frequent modifications to take advantage of the presence of visiting electric railway men or company officials. The talks are given by experts from the railway's staff or by outsiders, with such illustrations as the subject permits. Motion pictures and stereopticon slides are freely used. At some meetings entertainment features, such as group and solo singing, educational and humorous motion pictures and radio selections, are introduced by the group leaders.

Lecture Outlines Distributed in Advance

Men who accept invitations to address the groups are asked to furnish outlines of their talks at least two weeks before the meetings. These are mimeographed and distributed in advance, to serve as reminders of the dates and to assist in formulating questions for discussion. The outlines for each group will serve as a syllabus of the series. Where full manuscripts are prepared in advance by the speakers, they are filed with the railway librarian for subsequent binding. Condensed records of the discussion are also made for the same purpose, and to insure attention to the suggestions for service improvement which are brought out. Attendance at the meetings is recorded on individual cards, printed in a different color for each group. Group members are also provided with pocket cards containing the meeting schedules, each printed on stock of the same color as the group record cards.

*The power group conferences, which are administered by the Massachusetts Department of Education, follow a modified plan, as explained in the schedule on page 257.

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Five joint meetings, under the direction of the general manager, form part of the winter's program, and bring the five groups together. The first was held in November, with the editor of the Boston *Evening Transcript* as the principal speaker. One-minute reports were made by a score or more men who had represented the railway at the American Electric Railway Association convention or the National Safety Congress. At other general meetings prominent city officials and railway managers will speak.

The group conferences have already produced several by-products, notably a series of "talks" on accident prevention by the claim department staff. (See ELECTRIC RAILWAY JOURNAL, Jan. 31, 1925, page 185.) A joint committee from the auditing and maintenance departments, appointed to consider ways of minimizing stocks of stores, is a very recent development.

One lesson which the planning of this program showed early was that a uniform scheme could not be devised to fit all departments. For example, the power department found its needs best met by courses of lectures delivered by experts from outside the staff. Two series of 10 lectures each were arranged, one covering mechanical engineering, the other electrical engineering. The maintenance department divided its topics among its several sub-departments, with attendance optional to men not directly interested in a topic under discussion. The interest has been so great, however, that few men have been willing to miss any of the meetings. The transportation conferences are held in two sections, one in the morning for night men, the other in the evening for day men. The rolling stock group expected to hold some of its meetings at the Everett shops, but the large registration interfered. The women's group found it desirable, to insure sustained interest, to limit the list of topics to the 10 most essential for a general understanding of local railway operating methods. The women have shown an intense interest, with an enrollment, as in the other groups, much larger than expected.

The management of the Boston Elevated Railway does not regard the "departmental group conference plan" as an ultimate educational program. It lacks the home study element; but it has great instructional value and is stimulating. Moreover, it forms an excellent foundation for later study by those who desire such.

Its development on a large scale on the Boston Elevated illustrates the interest of the public trustees and the general manager in industrial education. One of the trustees, J. Frank O'Hare, is a trustee of the Franklin Union, a thriving vocational school founded on a bequest made to Boston by Benjamin Franklin. Mr. Dana is chairman of the committee on education of the American Electric Railway Association.

The railway's present educational activity began 3 years ago, when arrangements for instruction of a large group in practical electricity were made with the Massachusetts Department of Education. This was followed by other electrical courses and by one on public utility economics, delivered by L. R. Nash of Stone & Webster. The group conferences form the third stage in this educational development.

Schedule of Meetings of Departmental Group Conferences
Boston Elevated Railway

Season of 1924-1925

GENERAL MEETINGS—Nov. 12, 1924; Feb. 9, March 27, April 15, May 13, 1925

Women's Group

Meets at 7:30 p.m.

1924
Nov. 17. Auditing.
Dec. 1. Purchasing.
8. Track.
15. Training transportation employees.
1925
Jan. 12. Power.
19. Schedules.
26. Snow.
Feb. 2. Accidents.
16. Car operation.
March 2. The "Elevated" problem as a whole (Mr. Dana).

Power Department Group

Power Department Group Conferences are under the direction of the Massachusetts Department of Education, Division of University Extension, and meetings are held on Thursdays at 7 p.m., as scheduled.

The power department group is considering the following topics: Modern boiler practice; fuels and firing; combustion; fundamental principles of steam turbines; general features of turbine construction; development and operation of steam turbines; auxiliaries in high-vacuum turbine plants; steam—its properties and generation; economy as affected by power-plant operation; electrical generation—with reference to the construction and operation of generators, switchboards and meters; transmission—including oil circuit-breakers, protective devices, auto transformers and the advantages of high voltages; substations—manual and automatic operation, storage batteries, transformers, rotary converters, and protective relays; distribution—typical overhead and underground feeder system, together with switchboards, high-speed and air circuit-breakers, and cable testing; motors and controllers—direct-current apparatus including car equipment, shunt and compound motors, hand and automatic control equipment, alternating current apparatus, including single-phase, polyphase and synchronous motors and starting compensators.

Transportation Department Group

Meets at 10:30 a.m. and 7:30 p.m.

1924
Nov. 7. Accident prevention.
21. Accident reports.
Dec. 5. Employment and instruction of new men.
12. Relations with employees.
19. Selection and training of subofficials.
1925
Jan. 16. Treatment of passengers.
23. Complaints against employees.
30. Relation of maintenance to transportation.
Feb. 6. Power saving.
20. Carhouses and stations.
27. Cars and equipment.
March 6. Complaints against service and equipment.
13. Revenue accounting.
20. Handling of passengers off cars.
April 3. Traffic surveys and time-tables.
10. Dispatching and maintaining schedules.

Maintenance Department Group

Meets at 7:30 p.m.

1924
Nov. 4. Introductory meeting.
18. Practices in Cleveland, Ohio.
Dec. 2. Development of rapid transit in Boston.
9. Railway signaling.
16. Stores—accounting.
1925
Jan. 13. Manufacture of steel.
27. Accident prevention.
Feb. 3. Ordering and distribution of materials and equipment.
17. Erection of Boston Army Base.
24. Heat treatment of metals.
March 3. Stores—purchasing materials.
10. Uses of laboratory in preparing specifications and checking materials.
31. Welding and cutting of metals.
April 7. Maintenance of power circuits.
21. Relation of maintenance department to public officials and labor organizations.

Rolling Stock and Shops Group

Meets at 7:30 p.m.

1924
Nov. 5. Car construction, specifications, contracts, etc.
19. Car construction, review of designs.
Dec. 3. Car-body repairs.
10. Car-body painting.
17. Trucks—general principles and design.
1925
Jan. 14. Truck maintenance, wheels, axles, brakes, etc.
21. Railway motors—general principles and design.
28. Railway motors — service requirements, etc.
Feb. 4. Railway motors—maintenance.
18. Control equipment — principles and design.
25. Control equipment — multiple-unit.
March 4. Control maintenance.
18. Air brakes—principles and design.
25. Air brakes—maintenance.
April 1. Shop practices and handling stores.
8. General review.

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Repair Shops Keep Busy

THE Department of Commerce announces that, according to the data collected at the biennial census of manufactures for 1923, the repair shops of steam and electric railroad companies reported work done during that year to the aggregate value of $1,520,902,751, an increase of 19.9 per cent as compared with 1921, the last preceding census year. For steam railroad repair shops alone the total was $1,433,680,106, an increase of 21.5 per cent as compared with 1921, and for electric railroad repair shops it was $86,412,645, a decrease of 1 per cent.

Details of the statistics on electric railway repair shops appear in the accompanying table.

STATISTICS FOR ELECTRIC RAILROAD REPAIR SHOPS, 1923 AND 1921

	1923	1921	Per Cent of Increase or Decrease (a)
Number of establishments	547	560	—2.3
Wage earners, average number (b)	34,925	33,279	4.9
Maximum month	Nov. 35,492	Jan. 33,985	.....
Minimum month	Aug. 34,250	Nov. 32,571	.....
Per cent of maximum	96.5	95.8	.....
Wages	$49,225,583	$48,775,235	3.0
Cost of materials	$31,981,650	$33,560,133	—4.7
Paid for contract work	$110,949	$105,862	4.8
Value added by manufacture (c)	$54,430,995	$53,752,293	1.3
Horsepower	62,360	(d)	.....
Coal consumed (tons of 2,000 lb.)	135,216	(d)	.....
Total value of work or products	$86,412,645	$87,312,426	—1.0
Motive power and machinery departments, value	$7,303,972	$7,715,044	—5.3
Electric locomotives built:			
Number	17	(d)	.....
Value	$198,775	(d)	.....
Repairs to motors, etc., value	$6,692,410	$7,226,905	—7.4
Work for other corporations, value	$101,754	$78,472	29.7
All other work or products, value	$311,039	$409,667	—24.1
Car departments, value	$75,070,768	$75,529,519	—0.6
Cars built, value	$3,523,648	$1,248,267	182.3
Passenger:			
Number	299	127	135.4
Value	$3,287,447	$822,398	299.
Freight:			
Number	47	2	.....
Value	$103,738	$7,200	1,340.8
Other:			
Number	37	48	.....
Value	$132,463	$418,669	—68.4
Repairs to cars of all kinds, value	$65,420,854	$69,131,546	—5.4
Work for other corporations, value	$1,486,380	$1,249,497	19.0
All other work or products, value	$4,639,886	$3,900,209	19.0
Bridge and building departments (shop work only), value	$438,624	$516,942	—15.2
Repairs and renewals, value	$434,590	$420,445	3.4
All other work or products, value	$4,034	$96,497	—95.8
All other work or products, not classified, value	$3,599,275	$3,550,921	1.4

(a) A minus (—) sign denotes decrease. Per cent omitted where base is less than 100.
(b) Not including salaried officers and employees nor proprietors and firm members. Statistics for these classes will be given in final report.
(c) Value of products less cost of materials.
(d) Not reported.

Measuring Rail Deflections Under Load

INTERESTING experiments are being conducted on the lines of the Capital Traction Company, Washington, D. C., with a machine just developed by the Bureau of Standards, to measure the deflections of rail in paved streets caused by the passage of cars. This is being done jointly by the engineering staff of the company named and that of the Washington Railway & Electric Company. Measurement is not made of the actual deflection distances, but the comparative deflections under different conditions of service are obtained. Tests have been made with cars of different weights and having various types of truck. It is planned also to study the effect of flat wheels passing over the instrument.

In making these tests an aluminum bar, about 8 in. long and provided with two contact points, is placed on the base of the rail in contact therewith. One contact point is a part of the aluminum bar, while the other is attached to a hinged arm. Movement of this second contact and its connecting arm causes the compression of carbon particles contained within the bar, and this varies the resistance of the electric circuit.

This circuit is one arm of a wheatstone bridge, the other arms of which are housed in a portable box. A mirror carried on the galvanometer of the wheatstone bridge reflects a beam of light on a photographic film, which is moved at a predetermined rate by a small electric motor. Similar bars are placed on the head of the rail and in the center of the web.

After a small amount of pavement alongside the rail has been removed, the bars are placed in contact with the rail. The box containing the rest of the apparatus is carried on a small motor truck which stands near by in the street. When a car passes over the instrument the deflection of the rail is recorded in the shape of curves on the photographic film. Tests will be made at joints and also in the center of the rail. At present experiments have not been carried far enough to permit reaching definite conclusions. After several types of rail have been tested under different conditions of service, it is expected that the curves will furnish information valuable for study in connection with rail and car design.

Capital Traction Has 25 per Cent 10-Year Men

FIGURES just compiled by the Capital Traction Company, Washington, D. C., show that at the beginning of the present year more than 25 per cent of its employees had been in service for 10 years or longer. One man who first went to work for the company in 1868 had a service record of 56 years. Another had 51 years. Altogether nearly 1 per cent of the total number of employees have had more than 40 years of service. About 5 per cent have had between 30 and 40 years. Nearly 6 per cent have had between 20 and 30 years. Others over 10 years constituted 13.7 per cent. Listed among those with 30 years of service were J. H. Hanna, vice-president in charge of operation, and R. H. Dalgleish, chief engineer. The number of employees and the length of their service is shown in the accompanying table.

LENGTH OF SERVICE OF OFFICERS AND EMPLOYEES OF THE CAPITAL TRACTION COMPANY

Year Employed	Number of Full Years Service	Number of Employees	Per Cent	Year Employed	Number of Full Years Service	Number of Employees	Per Cent
1868	56	1		1905	19	9	
1873	51	1		1906	18	10	
1881	43	3	0.8	1907	17	18	6.8
1883	41	3		1908	16	19	
1884	40	2		1909	15	24	
1885	39	1		1910	14	9	
1886	38	3		1911	13	11	
1887	37	1	1.1	1912	12	28	6.9
1888	36	4		1913	11	18	
1889	35	4		1914	10	16	
1890	34	9		1915	9	10	
1891	33	7		1916	8	30	
1892	32	8	3.8	1917	7	82	32.0
1893	31	12		1918	6	134	
1894	30	8		1919	5	121	
1895	29	14		1920	4	111	
1896	28	1		1921	3	77	
1897	27	3	2.0	1922	2	66	30.3
1898	26	2		1923	1	104	
1899	25	4		1924	..	147	12.5
1900	24	6					100.0
1901	23	8					
1902	22	11	3.8				
1903	21	11					
1904	20	9					

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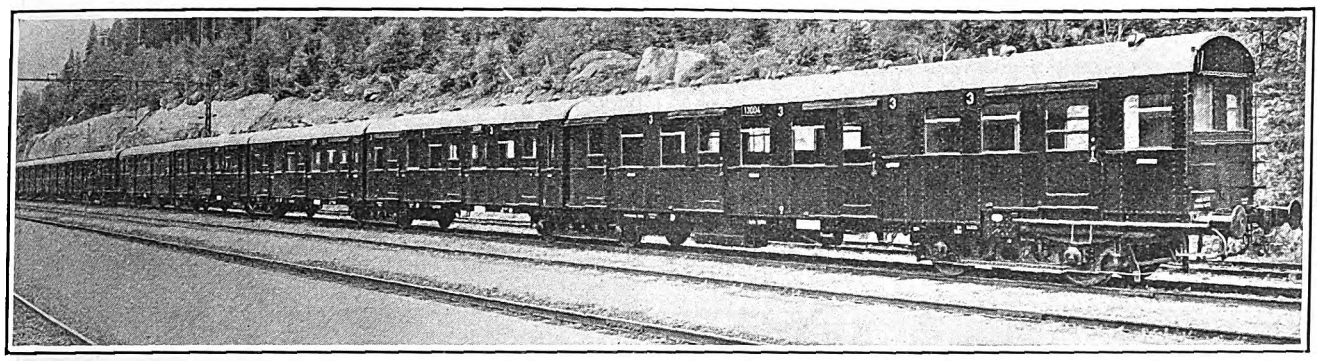


Each Half of This Berlin Articulated Train Has Five Car Bodies and Six Trucks

German Railways Try Articulated Trains

Tests Are Being Made at Berlin and Hamburg—Each Unit of the Berlin 10-Car Train Has Five Car Bodies and Six Trucks—This Train Is Being Used in Rapid Transit Service—The Hamburg Unit with Two Car Bodies Is Used on a Single-Phase Electric Railway

THE advantages accompanying articulation of car bodies have attracted attention in Germany as well as in this country and England. In fact, the claim is made that in Germany the principle of car body articulation was developed in 1901, although it has been applied in actual practice only during the last two years. There are at present two German railway properties operating articulated cars. One of these and the first to put them in service is the Berlin Stadtbahn, a part of the German government railroad system which extends through the city of Berlin and does a large short-haul business. It is soon to be electrically equipped but is now running by steam.

On this road there is one articulated train in service. This is in two halves, each unit having five car bodies and six trucks. This train has been in regular service in Berlin since Aug. 17, 1923, being hauled by steam locomotives.

An article in *Glaser's Annalen* for July 1, 1924, from which the following particulars are taken, states that a speed of 63 m.p.h. has been attained without troublesome side sway and with no sluggishness in the springs. The main dimensions of the entire train (10 bodies and 12 trucks) are as follows:

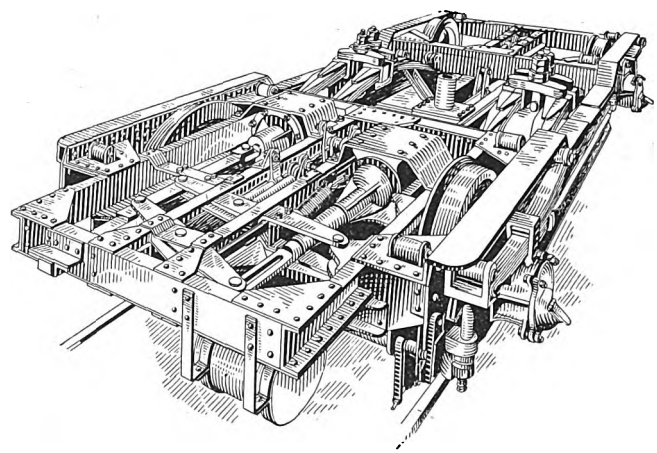
DIMENSIONS OF BERLIN 10-CAR ARTICULATED TRAIN

Length over all	140 m. (459 ft. 8 in.)
Distance between king pins	12.45 m. (40 ft. 10 in.)
Wheelbase of pilot truck	2.5 m. (8 ft. 2 in.)
Wheelbase of pivot trucks	3.5 m. (11 ft. 6 in.)
Length of middle car bodies	12.1 m. (39 ft. 9 in.)
Length of end car bodies	15.4 m. (50 ft. 7 in.)
Bulkhead clearance between middle car bodies	0.4 m. (15¾ in.)
Bulkhead clearance at end car body with the two halves coupled	1.3 m. (51 in.)
Wheel diameter of pilot trucks	1.0 m. (39 in.)
Wheel diameter of pivot trucks	0.85 m. (33½ in.)
Weight of train	218.5 metric tons
Weight of like capacity train made up of motor cars on trucks and of trailers with ordinary running gear	226.6 metric tons

It is pointed out that an equivalent motor car would require a king-pin distance of 14 m. instead of the 12.45 m. on the articulated car. This difference permits the latter to be built 40 mm. (15¾ in.) wider, thus reducing the gap between car and platform at stations along curved track. Without load the car floor is 1 m. (39.4 in.) above the head of the rails, but as the station platforms are 760 mm. (30 in.) high no intermediate car step is needed. Sliding side doors are used.

The pilot trucks at the outer ends of each unit are of the ordinary swiveling type and carry the motors. The pivot trucks are of special design and built under the Jakob patent. As shown in the drawing of this truck on page 261, the load is transmitted from the cylindrical king-pin *Z* through the brackets or bolster *D* to central semi-elliptic springs, thence to the side frames of the truck and through semi-elliptic springs to the journals.

King-pin guide blocks *K* are attached to the end sills *S* of adjacent car bodies, these guide blocks being of greater diameter than the king pin. The inclination of the car bodies toward one another in a perpendicular plane due to change of grade, bending of springs, etc.,



Inner Truck Used in Articulated Trains at Berlin and Hamburg

is so small that a slight bulge in the king pin suffices to take care of it.

The car bodies are allowed to slide on side bearings which are located as close to the king pin as possible. Any tendency of one car to sidesway is modified by the action of the spring system of the articulated truck common to adjacent cars. The conditions of train make-up do not call for passenger communication between cars, but if required it would cause less difficulty than on ordinary cars.

The wheelbase of the pivot trucks between bodies has been made long, thus offering another factor to give

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smooth running. The manner of carrying the load places so little stress on the side frames that comparatively light members are possible, even in the present instance with a wheelbase for the articulated truck of 3.5 m. (11 ft. 6 in.). The longer springs, of course, are of further advantage. In spite of this long wheelbase, the truck, including a Kunze-Knorr Type B braking cylinder, weighs no more than the customary truck of 2.5 m. (8.2 ft.) wheelbase, exclusive of braking equipment.

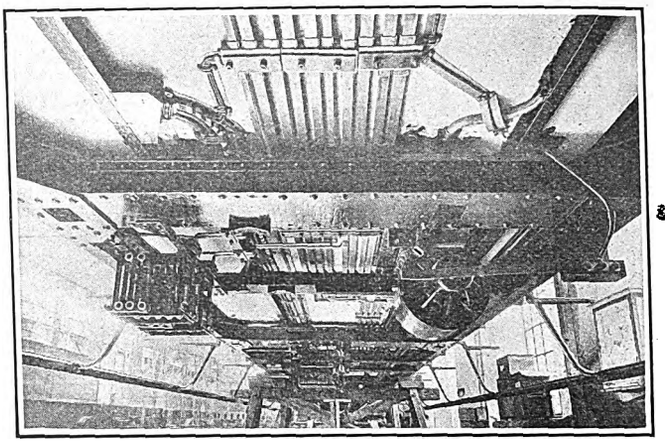
Although the articulated train described has a number of advantages, it is considered unlikely that it will become standard on the Stadtbahn. It was built on the assumption that with the line electrically equipped, the trains would consist of a mixture of motor and trail units and that four motors (two trucks) per half-train would serve. The latest plans, however, call for all motor-car units in order to secure maximum flexibility in variation in train length. This would double the number of motor trucks per train and so make the use of articulated trucks too costly.

HAMBURG IS TRYING DUPLEX MOTOR CAR

A second installation of an articulated train in Germany has been made on the Hamburg Stadt- und Vorortbahn, which is equipped with the single-phase system. This train, which has two bodies and three trucks, was supplied by the Gorlitz Car & Machine Company, which also built the Berlin unit. The forward truck of the articulated train is equipped with two motors, and the other trucks carry no motors.

The principal dimensions of the train are given in the accompanying table.

The forward car is divided into five third-class compartments, one baggage compartment and one service compartment. The second car has four second-class compartments, two third-class compartments, and one service compartment. There is no passageway between the cars. The pivot truck is of the Jakob type, similar to that under the Berlin train.

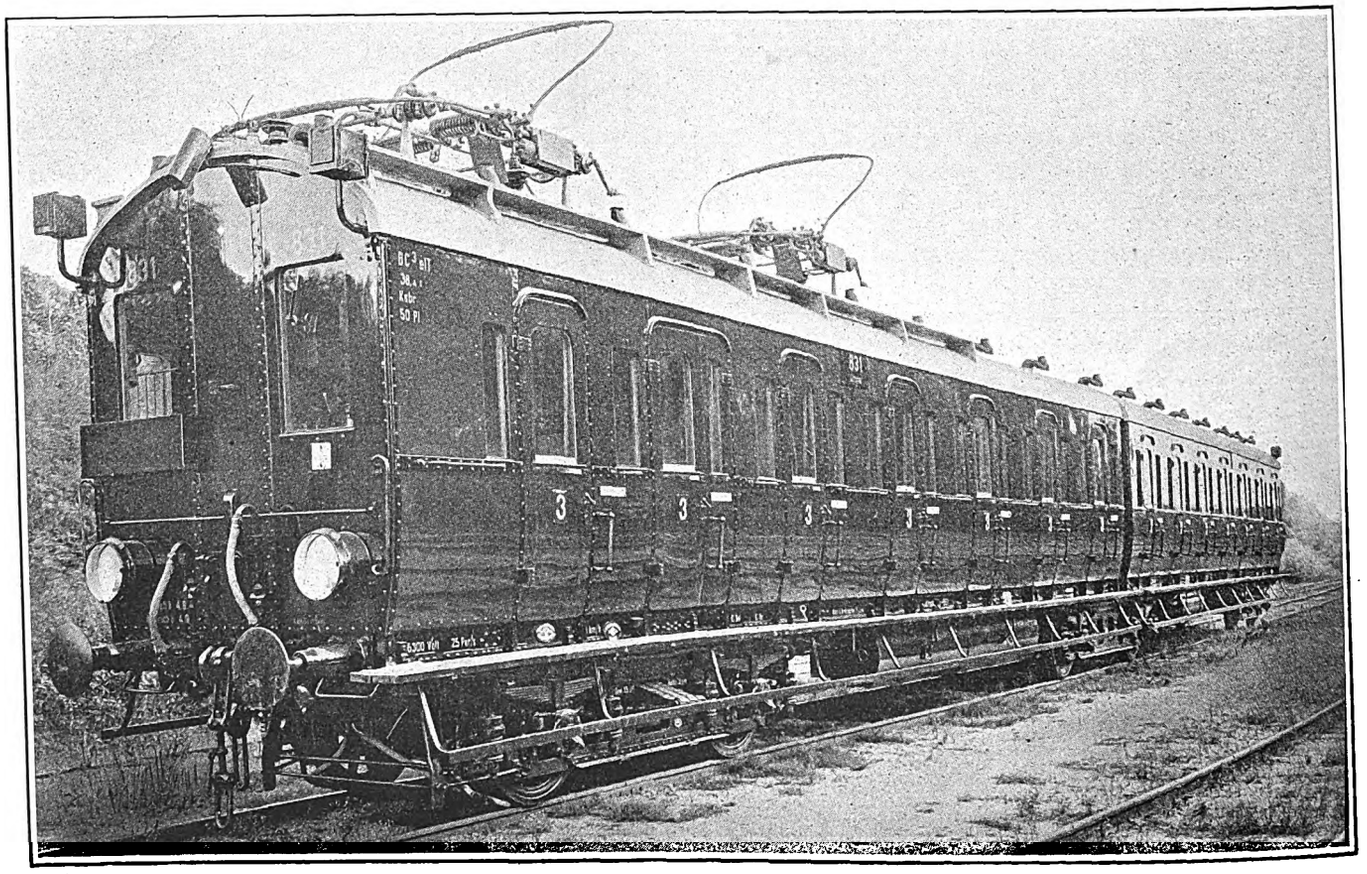


Underside of the Hamburg Car Body Showing Bare Rectangular Conductors Used for Low-Voltage, Single-Phase Circuits

The electrical equipment includes two compressed-air bow-type current collectors which take 25-cycle, 6,000-volt, single-phase current to a transformer, having an hourly rating of 300 kva. and a continuous rating of 200 kva. The two Brown-Boveri motors have each a continuous rating of 320 hp. and an hourly rating of 410 hp. Multiple-unit control is employed, so that any

DIMENSIONS OF HAMBURG ARTICULATED UNIT

Length of each single car body	14,222 mm. (46 ft. 6 in.)
Total length of articulated unit over buffers	30,000 mm. (98 ft. 6 in.)
Weight of unit, with complete equipment	66,000 kg. (145,000 lb.)
Outside width of car body	2,550 mm. (8 ft. 4 in.)
Wheelbase of motor truck	2,500 mm. (8 ft. 2 in.)
Wheelbase of pivot truck	3,500 mm. (11 ft. 6 in.)
Wheelbase of rear truck	2,500 mm. (8 ft. 2 in.)
Diameter of wheels	1,000 mm. (3 ft. 3½ in.)
Gage of wheels	1,435 mm. (4 ft. 8½ in.)



This Two-Car Articulated Train Is Used in Hamburg Suburban Service on the Single-Phase System

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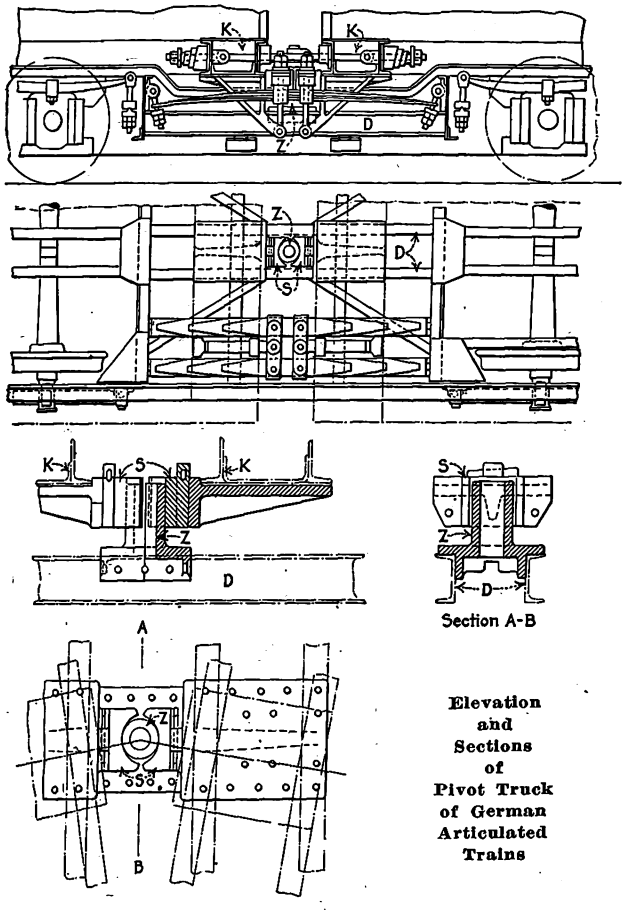


Elevation and Sections of Pivot Truck of German Articulated Trains

number of these double-end units can be operated together.

Instead of carrying the main low-voltage circuits in cable, use is made of bare conductors or busbars of 30x6 sq.mm. and 20x6 sq.mm. cross-section. They are carried from the underside of the car floor by means of wooden spacers and clamps. These bare conductors can be readily shifted and they are free from the arcing troubles possible from deteriorated cables.

An interesting feature of the heating is that the heaters are in circuit only when the controller is off, thus avoiding excessive peaks.

The forward car carries the motors and the transformer; the second car carries the compressor and a number of auxiliary devices. The compressor supplies air for brakes, current collectors and signals.

Silk Screen Sign Printing Used in Detroit

Special Equipment Built in Shops of Department of Street Railways Facilitates Work of Printing Route and Destination Signs for Maintenance

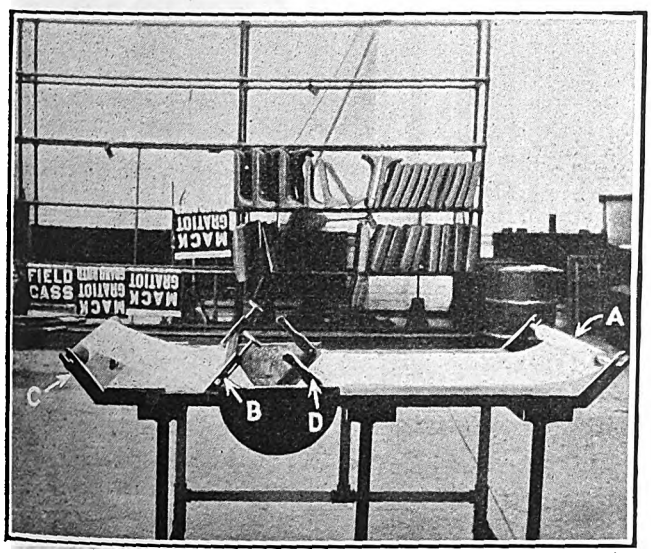
BY H. S. WILLIAMS
Assistant Superintendent of Equipment, Department of Street Railways, City of Detroit, Mich.

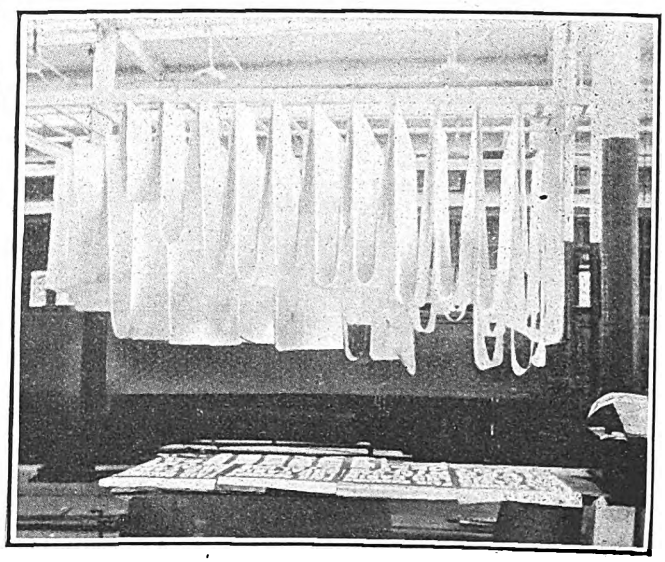
PRODUCTION of sign rolls for transparent route and destination signs on electric cars has undergone radical improvement in the shops of the Department of Street Railways, City of Detroit.

It was noted a year ago that several large electric railways were still making sign curtains by the old, laborious process of hand lettering. On most properties, however, stencils are used. This necessitates some hand work, but is a marked step in advance of the hand-lettering method. About 2 years ago a new process was instituted, which eliminated all hand lettering, and reduced costs materially. This was the silk bolting cloth and opaque letter method.*

The sign-making process as now used in Detroit is an adaptation of the silk bolting cloth process. The first step is the preparation of the sign cloth. A high-grade shade cloth is used, and is given a preliminary treatment with fish oil to increase its transparency as well as to make it easy to clean. This is menhaden oil purchased according to Navy Department specification 52-0-6. The oil is mixed with gasoline in the proportion of one part fish oil and one part gasoline. This mixture is then placed in the semi-circular trough of the table shown in an accompanying illustration. A roll of curtain cloth, which is cut to correct width on a band saw, is then put on roller *A*, from which it is run

*The silk screen or silk bolting process as used in Brooklyn was described in the ELECTRIC RAILWAY JOURNAL for December 15, 1923, page 1007.—ED.





The Shade Cloth on Which Signs Are Printed Is Treated in Advance with Fish Oil

As shown in the illustration at the left, the cloth mounted on roller *A* is passed through the bath of oil contained in the tank at the center of the table. Lever *D* connects with a weighted roller which holds the cloth down in the oil. *B* is a squeegee for wiping off the surplus oil as the cloth is wound up on roller *C* with a hand crank. The right hand illustration shows the treated cloth suspended for drying. The racks are arranged so that they can be lowered into a position handy for stringing the cloth.

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under a weighted roller which holds it in the oil bath. Coming out of the bath, the cloth passes under an adjustable squeegee, *B*. This wipes off surplus oil as the cloth is wound on roller *C* with a hand crank. The weighted roller in the bath is provided with a handle, *D*, by which the roller can be lifted out of the way when a new roll of cloth is being started through the apparatus.

After the cloth has been treated with fish oil the roller *C* is lifted off its support and placed in a similar holder on the drying rack. The cloth is threaded over the bars of the drying rack, where it is left until dry as shown. This rack, as the illustration shows, is similar to a very wide ladder and is arranged on pulleys so that it may be lowered for convenient handling and then raised up out of the way where the cloth is suspended in the warmest zone of the room to hasten drying. Experience indicates that it takes about 72 hours properly to dry the material in this way. After that the cloth is transferred to another roll preparatory to the printing operation.

How Stenciling Is Done

The next step concerns the type of stencil to be used. The stencils are made up in units 26 in. x 39 in. and contain five names each. They consist of substantial wood frames over which No. 10 silk bolting cloth is stretched. The letters are then applied to make the desired words. Here a change has been made from the customary silk cloth process. Instead of making the letters with opaque paint, they are cut out of paper and applied to the bolting cloth with shellac. Sharper edges on the letters result from this method in comparison with the use of opaque paint.

Each stencil has attached to it a brass hinge, slotted to receive a thumb screw on the table. The prepared sign cloth is hung on the roller *E*, which is provided with a small crank and pawl. The cloth is then run over the table and clamped in a groove, after which tension is applied with the crank and retained by the pawl. This stretches the cloth smooth for the printing. The stencil frame is swung down and locked firmly by means of two cam levers, *F*. Paint is applied to one edge of the stencil and one sweep of the squeegee completes the process of printing. The stencil is then swung up out of the way, and the printed section of the sign is cut and removed for drying. When not in use, the stencil frames are stored in the rack shown in another illustration.

Maintenance signs are made up in small sections because, in general, only comparatively small sections of the sign curtains wear out. Consequently, only these worn sections need to be cut out and replaced.

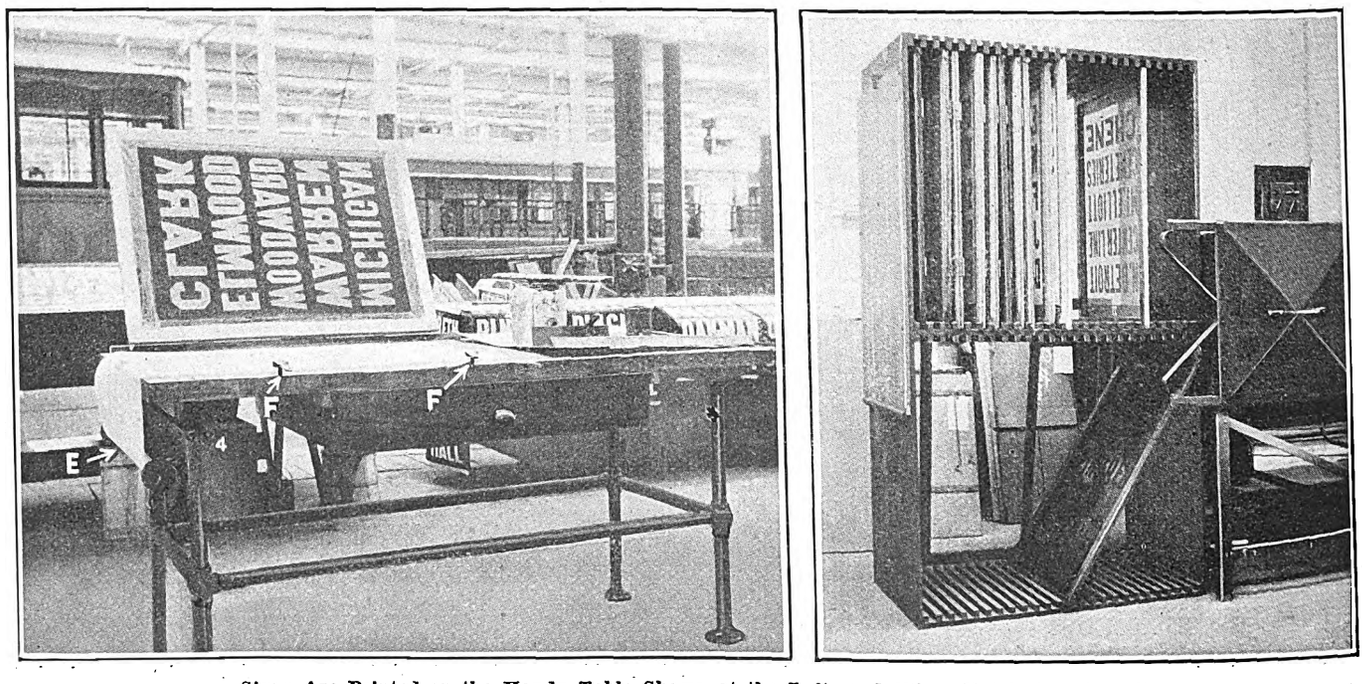
The black paint used for the printing is made according to the following formula: 5 lb. ivory black ground in linseed oil, 1 pt. raw linseed oil, ¾ pt. gold size Japan, and ⅛ pt. turpentine.

The previous cost of painting signs averaged $14.30 per sign including material. The new method has reduced this cost to $5.22 per sign.

Service Stripes for Detroit Trainmen

THE use of service stripes to designate length of service was recently begun by the Department of Street Railways, city of Detroit. A silver bar will be given for each year of service up to 5, when a gold bar will supplant the four silver bars. In addition to a gold bar for each 5 years of service a silver bar is shown for each year between 5 and 10 and 10 and 15. After 15 years of service gold bars only are worn, unless future developments indicate that the men themselves prefer to have the detailed service record displayed. Previous service with the Detroit United Railways will be counted.

The management believes that public relations will be improved by this step. When a trainman insists upon the observance of regulations by passengers, some people think he is only a novice. This idea will be changed by displaying evidence of the employee's service. On the other hand, the awarding of service stripes will tend to improve the morale of the trainmen.



Signs Are Printed on the Handy Table Shown at the Left, and When Not in Use Stencils Are Stored in Convenient Racks Shown at the Right

The stencil of silk with paper letters applied with shellac is hinged to the side of the table so that it can be readily lowered into position over the cloth. The roller *E* has a crank and pawl by means of which the cloth is stretched tight for printing.

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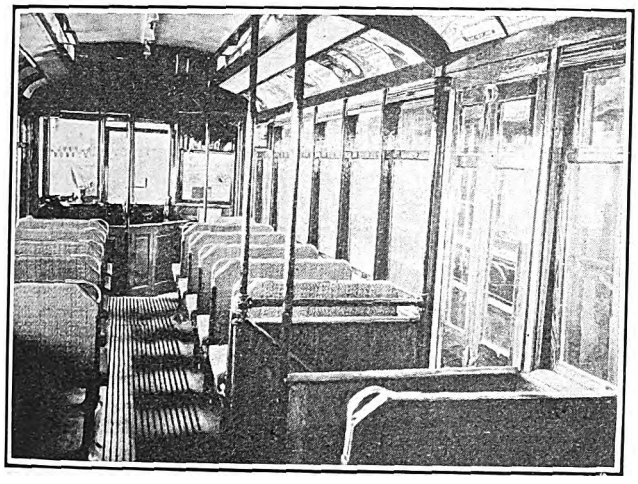
One-Man Cars Successful in Denver

Approximately 40 per Cent of Both City and Interurban Service Is Now Operated by One-Man Cars—Older Rolling Stock Was Rebuilt with Front Entrance and Center Exit

DURING the past year the Denver Tramway instituted one-man car service on several of its city lines and on the interurban division. This has been extended gradually with satisfactory results. Since Jan. 1, 1924, all owl service has been operated in that way as well as the day schedules on the Cherokee, Platte &



Front-Entrance and Center-Exit Arrangement on the Rebuilt Denver One-Man Cars. Note the Low Partition Which Incloses the Operator's Position

Globeville line. One-man operation has also been adopted on the Lyden & Golden division of the Denver & Intermountain Railroad, and on the Fifth Avenue line, serving an exclusive residential section of the city.

It has been general practice to increase the service up to 25 per cent in the number of cars when one-man operation is commenced. Approximately 40 per cent of the cars now in service are of the one-man type. Experience has shown that schedules are maintained as well as, or in some cases even better than, with two men. Operation by one man has not been found a handicap to carrying out the general policy of speeding up service on the entire property. Average schedule speeds are now approximately 10.4 m.p.h., including all layovers, dead time and stopping time. This also includes trailer operation during the rush hours.

On one-man city cars the practice is to have the passengers enter at the front and leave at the center of the car. This "circulating type" of construction has been found to give such rapid loading and unloading of the one-man cars as to have permitted a general increase in schedule speeds. On one-man interurban cars the exit and entrance are both at the front end. This is necessary for the collection of zone fares. The custom is to collect the city fare when the passenger boards the car and when he alights from the car to collect the proper interurban fare, which is based on the distance the passenger rides. Inbound to the city, the passenger pays the interurban fare on entering the car and is hat checked to intermediate points if he is not riding all the way into the city. The city fare is then paid upon leaving the car.

The success with which the general program of increasing schedule speed has been carried out in Denver is strikingly illustrated in the accompanying tabulation:

AVERAGE SCHEDULE SPEEDS ON ALL LINES IN DENVER

Year	Schedule Speeds M.p.h.
1917	9.66
1918	9.63
1919	9.40
1920	9.03
1921	*9.90
1922	10.30
1923	10.29
1924	10.40-10.50

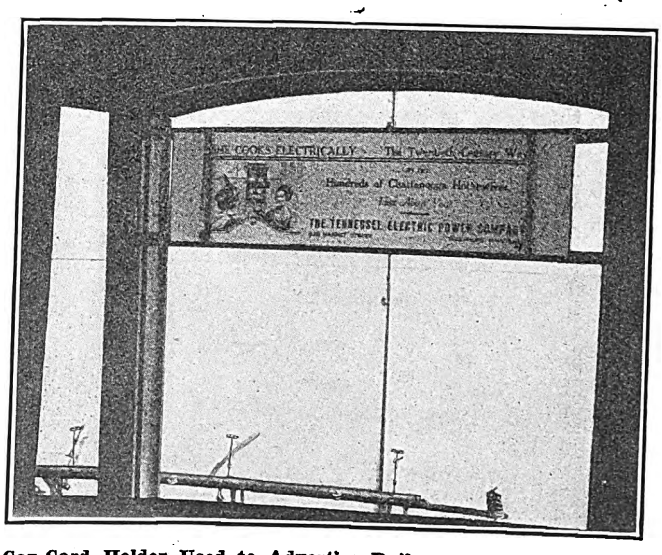
*New men after strike.

Some of the older, double-truck cars, which were formerly operated with two men, have been rebuilt for one-man operation. These cars are built of wood with concave-convex side panels. Motor and truck equipment was in fairly good condition, but the side panels, body floors and other parts of the structure in some cases required attention. Consequently, the wood panels were removed, necessary repairs were made to wood posts, new floors laid where needed and the entire body overhauled. The former wood panels were replaced with Haskelite. This material was used to add strength to the side structure.

Pneumatic door equipment and full safety car devices were installed on the cars, and body changes necessary for the construction of a single-exit door at the center were made. The finished appearance of the interior of these cars is shown in the accompanying illustration.

Two-Sided Car Window Cards Used in Chattanooga

IN THE merchandising of the trolley service and of the electric power service in Chattanooga, Tenn., the Tennessee Electric Power Company utilizes a part of the window openings in the manner illustrated. Cards are mounted in alternate windows and, being narrow (not



Car-Card Holder Used to Advertise Railway and Power Service in Chattanooga

more than 9 in. wide) they do not prevent the use of the windows for their primary purposes, permitting the passengers to enjoy the view outside and admitting light to the interior of the car. The card face presented to the interior of the car carries an individual advertisement, while the side facing the street carries one or two words of a legend which extends from end to end of the car.

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The fixture for holding the card consists of a metal strip at top and bottom, spanning from casing to casing and bent over to form a groove. Its width is about 1 in. The two strips are joined near each end by flat vertical pieces of metal 1¼ in. wide. Steel springs ⅜ in. wide slip into the grooves and hold the cards in place.

Side Cars Reduce Package Freight Costs

IN CONNECTION with its package freight service the Hydro-Electric Railways, which operates an interurban service out of Toronto, Canada, has recently installed a system of pick-up and delivery service by motorcycles with side cars. These are used principally for the long hauls on the outskirts of the cartage area served by the railway. According to W. R. Robertson, general superintendent, a motorcycle with side car will handle up to 1,000 lb. of packages and make 75 miles per day on 1¼ gal. gasoline and ¼ pint of oil. The average weight of packages handled by one of the cars is 5,000 lb. per day. The side cars have been found of particular advantage in getting around traffic blockades, and are able to make better speed than standard trucks. While considerable snow has already been encountered, no more difficulty has been experienced with the side cars than with ordinary motor trucks.

Previous to installing the new service which is given with three side-car motorcycles, the railway was operating as many as 10 gasoline trucks, each of which was making an average of 28 miles per day. It has been found possible to reduce this number, making a total of seven vehicles for the improved service.

Gasoline-Driven Car Float Effects Economy*

AMONG the physical difficulties encountered along the route of the San Francisco-Sacramento Railroad are 1 mile of 4½ per cent grade, a single trestle 13,571 ft. in length, a tunnel 3,500 ft. long and the presence of Suisun Bay in the middle of the route. All trains, both freight and passenger, have to be taken across this body of water on car floats. For this purpose steam-operated floats were formerly used, but the company has lately built a gasoline-driven ferry.

This boat was designed and built by the railway and its operation shows a considerable saving over the former steam floats. In the case of the latter it is necessary for steam pressure to be maintained continuously during 24 hours of the day in order to give day and night service. With the gasoline-driven car float the engine is shut off as soon as the boat has docked. The saving accomplished is considerable because the trip across the bay consumes only 10 minutes and the layover is approximately 1 hour.

For the convenience of passengers a dining room is operated on this boat and the deck has been built up to the level of the top of the rail so that passengers can walk around and enjoy the trip.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

The Readers' Forum

Snow Renewal in the Smaller City

YORK RAILWAYS

YORK, PA., Jan. 27, 1925.

To the Editor:

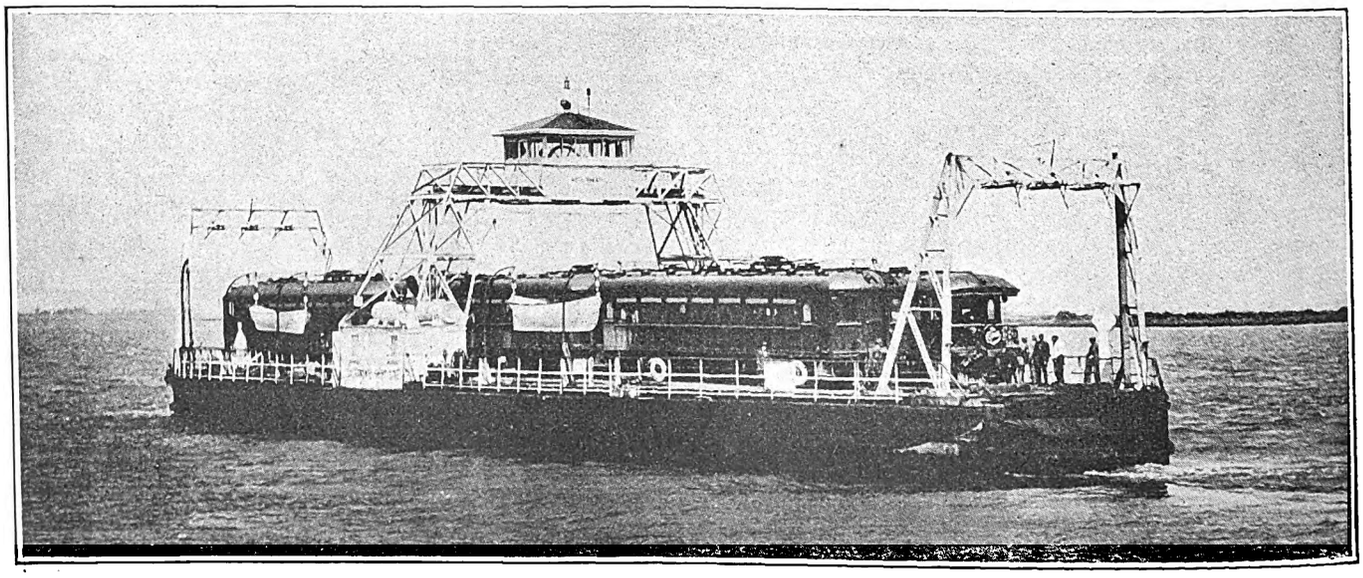
I have read with much interest your editorial in the issue of Jan. 24 entitled "Must the Railway Remove Snow from the Whole Street?"

Snow conditions as outlined therein are prevalent in this community and have resulted in slowing up our service considerably. However, notwithstanding the effect on service since the first heavy fall of snow this month, we have shown a considerable increase in railway revenue, due to the fact that, at least, some of the private automobiles have been parked in the garage until streets and roads are again in normal condition.

I estimate for the month of January a 7½ per cent increase in railway revenue as compared with the same month in 1924, due almost entirely to the recent snowstorms. Previous to the snow, we were showing decreases each day.

In this city, if we should clear the snow from the sides of the streets on which we operate, it would result in increased expense and decreased revenue, as we would be providing additional roadway for automobiles.

J. E. WAYNE,
Vice-President and General Manager.



All Trains of the San Francisco-Sacramento Railroad Cross Suisun Bay on this Gasoline-Driven Car Float

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Association News & Discussions

New England Club Discusses Car Weights

Savings in Operating Cost Due to Weight Reduction, Use of Gas-Electric Buses and Pulverized Fuel Fill Program

THE Feb. 5 meeting of the New England Street Railway Club was devoted to rolling stock and power plant topics, the principal speakers being John Lindall, superintendent rolling stock and shops, Boston Elevated Railway, on "Weight Carrying Costs"; J. C. Thirlwall, railway department, General Electric Company, on "Gasoline-Electric Buses," and W. C. Slade, vice-president United Electric Railways, Providence, R. I., on "The Pulverized Coal Installation of the Manchester Street Station in Providence." President T. H. Kendrigan occupied the chair, and the usual afternoon meeting, dinner and evening session were held at the Copley-Plaza Hotel. J. A. Queeney, president Philadelphia Rural Transit Company, gave an informal address on the gas-electric motor bus problem at Philadelphia, and Charles C. Peirce of the General Electric Company, Boston, outlined the changing conditions in equipment which traction men have met during the past decade and made a plea for open-minded consideration of future methods of public transportation in urban and suburban territory.

Mr. Lindall reviewed a comprehensive study of the cost of dead-weight haulage made by him a few months ago and summarized in ELECTRIC RAILWAY JOURNAL, issue of July 26, 1924. Following the presentation of these figures, E. P. Locke, engineer of car design Boston Elevated Railway, described the analysis of the East Boston Tunnel car design which preceded the building of these rolling stock units, in which a total saving of about 10,000 lb. per car was achieved. These cars were described in this paper for Aug. 23, 1924. In passing it may be recalled that weight reduction was secured among other ways by the use of outside doors and a wall of one thickness, by special floor construction, by using a semi-arch type of roof and equipping the cars for one-end operation each and in trains. It is estimated that the additional cost of hauling cars in tunnel service would have been $108,000 per year had they been designed along the general lines of the previous Boston Elevated rapid transit cars.

Mr. Thirlwall said that figures made by his company agreed with Mr. Lindall's on the cost of weight haulage. For city service a fair average of 150 watt-hours per ton-mile is acceptable at the direct-current bus. A car running 36,000 miles per year thus consumes 5,400 kw.-hr. per ton (d.c.) per year. Maintenance may be 0.2 cent per ton-mile. Computing the power cost at $81 per ton per year and the maintenance at $72 per ton per year the total is roughly $150. Modern street cars have a first cost of about $800 per ton. One ton of car weight calls for the equivalent of 2-kw. capacity in generating plant and substation.

R. D. Hood, Haverhill, Mass., estimated that when maintenance costs reach 10 cents per car-mile, it is time seriously to consider retiring the rolling stock.

OPERATING RESULTS WITH LIGHT CARS

A. J. Boardman, manager Brockton division Eastern Massachusetts Street Railway, said that in his opinion the one factor that stands between the street railways and prosperity is excess and unnecessary weight of cars. In 1917 the standard semi-steel double-truck car on his property weighed 900 lb. per seat. The so-called light-weight car weighs 685 lb. per seat and the Birney car 530 lb. per seat. The Twin City experimental light-weight double-truck car weighs 375 lb. per seat.

The bearing of equipment weights on power consumption is shown by the following figures:

The direct-current kilowatt-hours per car-mile of the Brockton division of the Eastern Massachusetts for the past 5 years was: In 1920, 4.76; 1921, 3.699; 1922, 3.879; 1923, 3.80; 1924, 3.52—a reduction in 5 years of 1.24 kw.-hr per car-mile, or of 26 per cent. Had the company operated in 1924 at 4.76 kw.-hr. per car-mile, the power charge in the Brockton district would have been increased last year by $45,422 at a rate of 1.77 cents per kw.-hr. According to Mr. Boardman this decrease is due to (1) modern light-weight equipment; and (2) better track return by welding and bonding. The reduction in passenger car weight has been due (a) to the use of the Birney type safety car, and (b) to the use of double-truck cars weighing about 32,000 lb. against 42,000 lb. for the standard double-truck car. The increase of the mileage of the Birney cars and the light-weight, double-truck cars has been from zero in 1920 to about 62 per cent in 1924.

The decrease in energy consumption with the light-weight equipment is not always accomplished unless the light-weight cars are put into the service for which they are designed and geared. It was found on one line of the Eastern Massachusetts that when a light-weight, double-truck car of 16 tons was substituted for a standard 21-ton double-truck car, both operating on the standard schedule with the same number of stops per mile and the same gear ratio, there was a saving of only 5 per cent in energy. Using a properly geared light-weight car on the same route, the saving in energy consumption over the heavy double-truck car was approximately 19 per cent on a few trips, and would probably be greater still over a fair period of time.

A study of another line showed that the substitution of a light-weight double-truck car for a standard double-truck car with the same gear ratio would save on this route with a schedule of 197,467 car-miles $1,760 per year in energy alone. The schedule speed is 15 m.p.h.

Again the company was operating double-truck, light-weight cars on a city and suburban line with a schedule speed of 9.5 m.p.h. Business fell off on account of industrial conditions, and these cars were replaced with standard Birneys. The light-weight, double-truck cars were put on another line with a schedule speed of 12.5 m.p.h. and they maintained this without difficulty. Temperature readings of the motors were satisfactory and it was also found that these cars could be operated on the route nine months in the year with a material saving in energy; for the other three months a heavier type of car was needed on account of the need for better traction to surmount grades and to fight snow.

Frequent use of single-truck Birney cars is made wherever traffic and service conditions warrant, care being taken to avoid overcrowding. If there is overcrowding the saving in power is offset by popular prejudice against this type of car. By service checks it is possible accurately to determine when to use these cars. It has been found that the seasonable variation in their mileage from summer to winter on the Eastern Massachusetts is as high as 260 per cent, the maximum use of these cars being in summer.

INCREASE IN SINGLE-TRUCK MILEAGE

	Single Truck	Per Cent	Double Truck	Per Cent	Light-Weight Double Truck	Per Cent	Total	Per Cent Light-Weight Cars
1920....	265,635	10	2,288,603	90	.....	0	2,554,238	10
1921....	598,277	26	1,692,778	74	.....	0	2,300,945	26
1922....	549,033	24.7	1,490,231*	65	259,250*	11.3	2,298,414	36
1923....	437,666	19.8	998,190*	45	775,625*	35	2,211,481	54
1924....	508,366	24.2	785,576*	38	775,625*	38	2,069,567	62

*Estimated.

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F. B. Walker, chief engineer maintenance of way Eastern Massachusetts Street Railway, Boston, pointed out that Massachusetts is assessing the electric railways a high proportion of bridge rebuilding costs, figuring these on a theoretical 100,000 lb. car used for computation purpose by the Department of Public Utilities. This allocation should be successfully disputed with the advent of light-weight cars.

GAS-ELECTRIC BUSES DISCUSSED

In discussing the gas-electric bus problem, Mr. Queeney said that the approach was through the inquiry as to what could be done in order to carry the maximum number of passengers, regardless of the type of motive power involved. Last year New York taxicabs earned $25,000,000 more than all the street cars of the metropolis. He outlined the study which led to the selection of gas-electric as against straight gasoline motor drive. It is expected that there will be economies in running gear maintenance and that faster and more comfortable schedules will be secured by the gas-electric bus. There have been 125 double-deck buses of this type purchased for the Philadelphia company (capacity 66 passengers) and 75 single-deckers holding 33 passengers each. The street railway man who goes into the bus field must be prepared for a surprise in the increased cost of maintenance compared with electric car service.

An abstract of Mr. Slade's paper will appear in a later issue.

Association Secretaries Meet

THE annual meeting of the Association of Public Utility Secretaries was held on Feb. 9 at St. Louis. Discussion of ways and means of increasing the effectiveness of utility association work constituted the business transacted. The following subjects were discussed:

"Committee Organization and Work," D. L. Gaskill, Ohio; "Section Meetings Within State Associations," J. N. Cadby, Wisconsin; "Entertainment at Conventions," R. V. Prather, Illinois, and F. D. Beardslee, Missouri; "Program Materials and Arrrangements," K. R. Noyes, American Gas Association; "The Extent to Which Organization Should Be Carried," H. M. Davis, Wisconsin, and H. L. Jones, Kansas, and "Bulletins and Publication," J. W. Colton, editor *Aera*.

Following the exchange of ideas, Secretary E. N. Willis of the Southwestern Association was re-elected president and J. N. Cadby of the Wisconsin Association, secretary.

Bluff Point Selected for New York State Meeting

BLUFF POINT, N. Y., on Lake Champlain, has been selected by the executive committee of the New York Electric Railway Association as the place of its annual meeting.

In view of the importance of the subjects confronting the industry today and the interest shown at previous meetings it was decided to hold a 2-day meeting on June 26 and 27.

Further details regarding the program will be published later.

Overhead Line Material Standardization

A CONFERENCE on the unification of overhead line materials was held at New York on Jan. 13, representatives of nineteen interested organizations being present.

The conference recommended by unanimous action that an extensive program on the unification of overhead line materials go forward, under the procedure of the American Engineering Standards Committee. It was decided that the work should include cross-arms, pins, pole steps, brackets and molding; pole line hardware, including such items as anchor rods, bolts and lag screws, brackets, cross-arm braces, guy fittings, pins and strand for suspension and guying, and strain insulators, spools, knobs, etc.

There was an extended discussion as to whether work on insulations should be limited to low-voltage material or whether the other important types of insulators should be included. A small committee appointed to formulate definite recommendations reported the following recommendations, which were unanimously approved:

Certain classes of insulators have reached a stage of development which seems to warrant standardization; others can be standardized as to certain important dimensions; still others are in a development stage which makes attempted standardization, other than along the broadest of lines, of questionable wisdom.

It is recommended that standardization in this general field be undertaken to such an extent as the facts developed by a subcommittee, or such other agency assigned to this work, may seem to warrant.

Of the other types, strain insulators for low potentials, spools, knobs, etc., which are used in common by the several branches, standardization is recommended.

The conference agreed that the work should include nomenclature, material specifications and dimensional data.

The following committee, advisory to the A.E.S.C. in the organization of the work, was appointed: R. F. Hosford, American Telephone & Telegraph Company, chairman; Alexander Maxwell, National Electric Light Association; G. C. Hecker, American Electric Railway Association; C. C. Beck, Associated Manufacturers of Electrical Supplies; J. C. Johnson, Telephone Section, and George Eisenhauer, Electrical Section, American Railway Association.

An important part of this committee's work will be a recommendation on the question of sponsorship. All interested groups will participate in the work through representation on one or more sectional committees which will be set up for the work.

C. E. Skinner, chairman of the A.E.S.C., acted as chairman of the conference.

Oklahoma Convention Will Be Held March 10-12

A NUMBER of well-known public utility executives will address the seventh annual convention of the Oklahoma Utilities Association, to be held at Oklahoma City, March 10, 11 and 12. "Community Transportation" will be the subject of a paper by F. R. Coates, of Henry L. Doherty & Company, New York. M. H. Aylesworth, managing director National Electric Light Association, New York; Miss R. E. McKee, national chairman Women's Public Information Committee of the N.E.L.A.; W. S. Vivian, director of public relations Middle West Utilities Company, Chicago, and John C. Hall, St. Louis, are among the other speakers.

Illinois Association Meets March 18-19

THE Illinois Electric Railway Association will hold a joint convention with the Illinois Electric Association and the Illinois Gas Association at the Sherman Hotel, Chicago, March 18 and 19.

As announced by Secretary R. V. Prather, there will be a joint session during the morning of each day, and separate meetings of the gas, electric and electric railway associations in the afternoons. The annual banquet will be held on Wednesday night.

Two new features of this convention will be a group luncheon on Wednesday, at which time tables will be arranged for executives, accountants, engineers, etc., and a utility advertising exhibit.

The program of the electric railway sessions follow:

March 19, 1:30 P.M.

"Merchandising Electric Railroad Transportation," by D. W. Snyder, Jr., vice-president Illinois Traction System, Springfield; J. F. Egolf, general manager Aurora, Elgin & Fox River Electric Company, Aurora; John J. Moran, commercial manager Chicago Rapid Transit Company, Chicago.

"Bus Transportation."

1. "As Replacing Railway Operation," by C. G. Moore, general manager and purchasing agent Plainfield & Joliet Railroad, Joliet.
2. "As a Feeder to Electric Railway Operation," by B. W. Arnold, manager motor coach department Chicago, North Shore & Milwaukee Railroad, Milwaukee.
3. "Joint Service," by M. L. Harry, division manager Illinois Power & Light Corporation, Decatur.

March 18, 1:30 P.M.

"Maintenance."

1. "Equipment."
2. "Overhead Construction," by F. V. Skelley, superintendent Tri-City Railway, Rock Island.
3. "Track," by J. I. Catherman, engineer maintenance of way Illinois Traction System, Springfield.

"Safety and Insurance," by C. B. Scott, Bureau of Safety, Chicago.

"General Discussion of Railway Problems," by J. R. Blackhall, J. H. McClure, R. F. Palmblade, George A. Mills, W. H. Sawyer, F. E. Fisher, W. C. Sparks and W. L. Arnold.

Locomotive Motor Design Discussed by A.I.E.E.

FACTORS affecting the design of direct-current motors for locomotives were discussed by Ralph E. Ferris, Westinghouse Electric & Manufacturing Company, in a paper presented at the midwinter convention of the American Institute of Electrical Engineers at New York on Feb. 9-12. A comparison was made between different types of motor mounting, as regards the amount of power which may be developed in the available space with direct-current motors. The comparisons are largely qualitative, the author states, but within reasonable limits they may also be considered quantitative. Designs for 1,000 volts and 3,000 volts only were considered, although the same principles are stated to be applicable to other voltages.

The various factors are taken up in a mathematical discussion, which covers

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the effect of various limitations which were imposed by the conditions of track, method of motor mounting and output.

The output factor increases, in general, with increase of armature diameter, the relation being quite complicated. There is a real limit to the amount of power which may be placed between the wheels with an axle mounting, regardless of wheel size. Fortunately, this limit is sufficiently high to permit of a fairly heavy axle loading with speeds of between 15 m.p.h. and 20 m.p.h. This, coupled with the simplicity of drive and ruggedness of motor construction, place the combination well toward the front as a solution of the d.c. heavy traction problem. With quill drive it is found desirable to have somewhat more clearance between the wheel flange and the end housing of the motor than in axle mounting. Otherwise the proportions of space are the same and, therefore, the curves of output will be approximately the same as those for axle mounting. The quill drive does, however, permit the use of a twin motor construction and thus, unless limited by the drive, gives twice the power per axle as with an axle-hung motor. In the case of frame-mounted motors, with side rod or gear and side rod drive, if the motor is made self-contained, so that it may be lifted out of the locomotive frame complete, there will be less room available for active material than if the armature bearings are mounted in the side frame of the locomotive and end housings are omitted.

In his conclusions, the author states that axle-mounted, direct-current motors may be built which have sufficient power to permit fairly heavy axle loadings. Quill drive d.c. motors may be built, of which the power per axle will probably be limited by the method of transmitting power to the wheels rather than by the motors themselves. On the contrary, d.c. motors for side-rod or gear and side-rod drive may be built to develop practically any desired power. Gearless motors may be built which have sufficient power for comparatively light axle loadings, this light loading necessitating a larger number of axles for a given locomotive rating than would otherwise be used. A lower-voltage motor has a definite advantage in possibilities of greater output for a given armature diameter.

American Association News

Coffin Prize Conditions Changed

THE Charles A. Coffin Prize Committee of the American Electric Railway Association, consisting of President J. N. Shannahan, James H. McGraw and F. R. Coates, has recently sent out a circular letter describing the terms of the 1925 contest.

Under the terms of the Charles A. Coffin Foundation this award is given annually to the electric railway company within the United States which during the year has made distinguished contribution to the development of electric railway transportation for the convenience of the public and the benefit of the industry. The award consists of a gold medal for the winning company and $1,000 which is given to the company's employees' benefit association or similar organization.

Inasmuch as there has been some change in the form of the measuring stick which the committee will use in determining the winner, the factors used are given below in full:

1. The success in gaining public good will as indicated by the initiative, skill and enterprise manifested in popularizing electric railway service — more riders and more revenue.

2. The economies which had been introduced in operation resulting from original ideas, as well as the extent to which the company has taken advantage of new developments in operating and maintenance practice and equipment originating with others.

3. Improvements in construction practice which have resulted in reduced first cost, reduced maintenance, or greater reliability of service.

4. Particular success in conducting a safety program and actually reducing the number and seriousness of accidents.

5. Outstanding accomplishment in development of good relations between management and employees.

6. Special accomplishment in financing, which reduces the cost of new capital, such as the distribution of securities among customers and employees, rearrangement of the financial structure, etc.

All participants are requested to present financial and operating statements on a unit basis covering the period of the last 12 months available in comparison with the previous 12 months, or for a period of years (revenues, expenses, taxes, fixed charges traffic and mileage figures, shown in accordance with A.E.R.A. detail classification, all of which, if desired, will be considered confidential).

The preference of the committee is that all presentations be made on standard typewritten sheets and accompanied by such supporting figures and drawings as may be required. All presentations must be in the hands of the committee by Aug. 1, 1925, and companies are requested to limit their accomplishments as far as possible to those occurring in the year ending as nearly as possible with this date. However, any accomplishment extending over a period of years and reaching its fruition in this period will be considered by the committee as relevant. The committee requests that each presentation be made in such form that it may be retained as the property of the association and that consent be given to its publication either in whole or in part with the name of the company, except such as may be marked confidential, whether the company receives the award or not.

The presentations made in the year 1923 were printed in bound book form, which has had the widest possible distribution throughout the country and has been received everywhere as tangible evidence of the progress of the industry. The 1924 presentations are now in the course of preparation for printing in similar book form, as the committee desires to perpetuate this record of the industry's accomplishments.

The announcement of the award will be made at the annual convention of the association in October, 1925. Presentations should be addressed to the Charles A. Coffin Committee of the American Electric Railway Association, 292 Madison Avenue, New York City, N. Y.

Engineering Symbols

A MEETING of the special committee on engineering symbols was held at association headquarters, New York, on Feb. 2. Members present were H. R. Stamm, chairman; R. C. Cram, H. W. Codding and C. W. Squier. The work of previous committees in preparing engineering symbols was gone over and it was decided that the work of the 1925 committee should include the preparation of all engineering symbols which are applicable to the electric railway industry.

The various types of symbols were divided into six groups as follows: (1) Topographical, (2) buildings and structures, (3) electrical, (4) railroad, (5) mathematical, (6) mechanical equipment.

Assignments were made to various members of the committee to work up symbols in each group.

Metropolitan Section Grows

AT THE meeting of the Metropolitan Section of the American Electric Railway Association held at the Engineering Societies Building, New York City, on Feb. 6, announcement was made by President W. E. Thompson that the membership had reached a total of 796, an increase of 25 since the last meeting. Before adjournment the total had swelled further to more than 800.

The technical papers presented at the meeting included one on power generation in the metropolitan district by J. H. Williams, assistant engineer motive power department, Interborough Rapid Transit Company, and one on power conversion and distribution by W. O. Wentworth, engineer transmission department, New York Central Lines.

According to Mr. Williams the electrical output in the metropolitan district is now 6,200,000,000 kw.-hr. annually, being 11 per cent of the total output of the entire United States.

Discussing the paper H. D. Sheflin of the Westinghouse Electric & Manufacturing Company stated that the coal rate for energy generated in the metropolitan district can be reduced by installation of larger units utilizing higher steam pressures and temperatures, and by the elimination of small isolated plants.

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Maintenance of Equipment

Portland Signal Failures Decrease

By H. J. CHARTERS
Portland Electric Power Company, Portland, Ore.

THE number of operations per failure of the block signals on the interurban lines of the Portland Electric Power Company at Portland, Ore., has increased nearly 100 per cent, as shown by the annual signal report for 1924. During the past year 17,088 movements of the signals occurred for every failure recorded as compared with 9,103 for 1923. [See ELECTRIC RAILWAY JOURNAL for April 12, 1924, page 588.—Ed.]

But one failure of the actual signal mechanism of the Type G-1 United States signals in use on this road took place. This failure was caused by moisture corroding the winding on a semaphore coil, which could not be seen by the maintainer and which eventually caused an open circuit. While no indication could be received under this condition, complete protection was afforded as the relay governing the signals was set to protect the train entering the block; hence an opposing train could not receive a clear indication from the other end.

SIGNAL FAILURES BY MONTHS AND YEARS

	1921	1922	1923	1924
January	..	6	22	2
February	..	5	10	3
March	10	3	13	5
April	13	8	8	5
May	17	4	8	4
June	9	15	16	10
July	16	8	6	8
August	12	1	8	5
September	8	1	4	3
October	6	8	2	7
November	16	6	6	1
December	10	9	5	5
Total	117	74	108	58

Decrease in the proportion of contactor failures is to be noted in the report, although during December the coldest weather in 50 years was experienced in this locality. Failures from blown fuses also decreased during the year, principally due to the absence of electrical storms. The manufacturers recently increased the size of the fuses in this type of signal from 2 amp. to 5 amp., but no changes have been made by this company as the smaller fuse gives satisfactory results.

Directional relay and contactor troubles continue to be the main source of interruptions, although during the year different types of contactors were tried without much success.

No. 5 contactor switch failures increased considerably during the period due to a shortening of the scheduled running time between terminals. Under such conditions the signals are of more value than before, but it is difficult to control the speed of trains while passing under these contactors.

No changes were made during the year in the number of scheduled trains. Therefore the figures for average movements remain the same as in the two preceding years.

No additional signals were installed on the interurban lines in the period, but several betterments were made in the form of repeating indicators so that it might not be necessary for the motorman to look back to see the signal clear as he leaves the block when approaching stations or obscured crossings.

BLOCK SIGNAL FAILURES, INTERURBAN LINES OF THE PORTLAND ELECTRIC POWER COMPANY, 1921-24

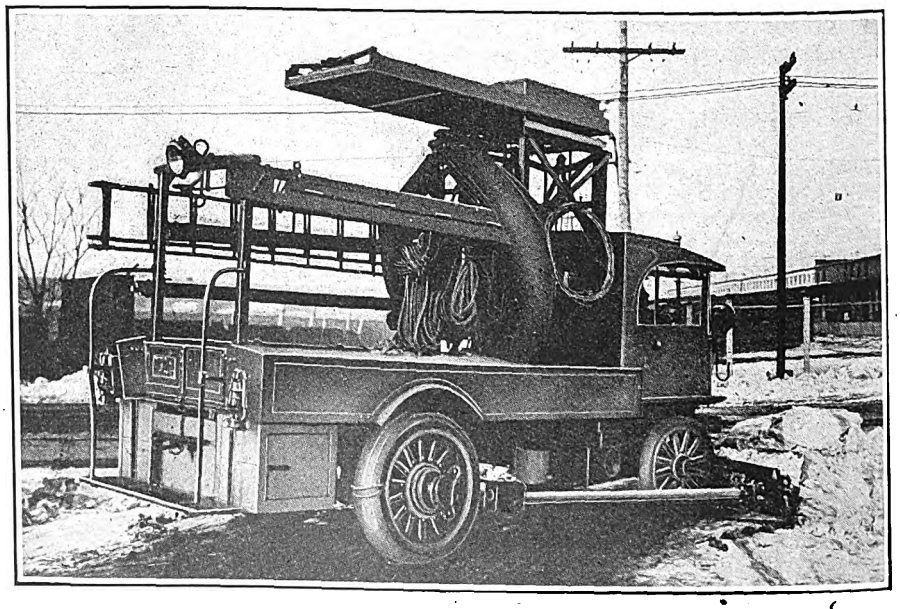
Number of miles of track blocked:	1921	1922	1923	1924
All divisions	21	21	21	21
Number of blocks	20	20	20	20
Number of signals	40	40	41	41
Total movement of signals	843,464	991,082	991,082	991,082
Average movement per block	42,173	49,554	49,554	49,554
Average daily movement per block	138	136	136	136
Number of movements per failure	7,148	13,393	9,103	17,088

ANALYSIS OF FAILURES

	1921		1922		1923		1924	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Line wires	5	4	5	7	6	5.56	0	.....
Switch and pole wiring	2	2	3	4	12	11.11	3	5.17
Blown fuses	7	6	3	4	15	13.89	5	8.62
Directional relay	29	25	22	30	34	31.48	16	27.59
Signal trouble	6	5	1	1	3	2.78	1	1.72
Contactors	44	38	26	35	24	22.22	13	22.42
No. 5 switch	7	6	2	3	8	7.40	10	17.24
Miscellaneous	6	5	1	1	0	.....	4	6.89
No trouble found	11	9	11	15	6	5.56	6	10.34
Total	117	100.00	74	100.00	108	100.00	58	100.00

Line Truck Used for Many Jobs

AN UNUSUALLY well-equipped truck is used by the United Railways of St. Louis for the maintenance of overhead and underground distribution systems. It is equipped with an overhead collapsible tower and a full complement of ladders, tackle and hand tools. In addition



This Line Truck Is Equipped so that It Is Handy for Many Different Jobs on the Property

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to the storage space in the bed of the truck body, two long tool boxes extend along either side to give additional capacity for materials and tools, and a locker below the bed makes use of the space between the rear wheels, and the rear step.

For underground work, a spotlight is mounted at the back end in such a position that it is convenient for lighting up manholes. An extension on the hub of one of the rear wheels forms a convenient point for wrapping a rope, so that by jacking up the rear wheel it becomes a very effective windlass for pulling in underground cables or other similar work requiring considerable power.

A removable snow plow is handy for clearing up snow around the yards.

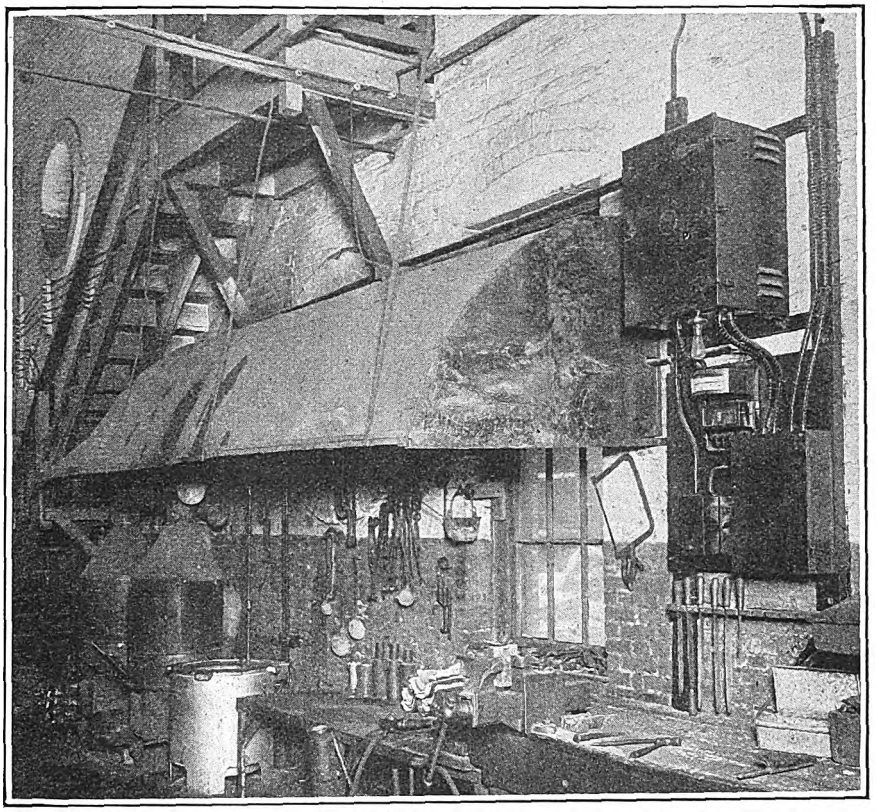
Preventing Freezing of Air Pipes

CONSIDERABLE trouble was experienced during the cold winter season by freezing of the air lines on safety cars of the Northern States Power Company, Fargo, N. D. A patented device filled with wood alcohol was tried with considerable success. The suggestion was made to pour wood alcohol into the pipes on cars not provided with the device. This latter method has given good satisfaction and has eliminated all freezing. About every 5 days 4 oz. of wood alcohol are poured into the pipe leading from the double check valve to the outside air reservoir. The amount of alcohol used will vary somewhat with weather conditions. The air reservoir is drained whenever new alcohol is added, but no draining is permitted between these intervals. It is found that the cost of alcohol used in this manner is more than justified by the improvement in service resulting from reduced number of delays due to frozen air.

Close Temperature Control Insures Good Babbitt Metal

AN ELECTRICALLY heated babbitt melting pot with thermostatic control has been found by the Washington Railway & Electric Company to be a great improvement over older types because it is possible with this apparatus to maintain the molten babbitt at a certain definite temperature. High grade babbitt metal can be made almost worthless for use in bearings by allowing it to become too hot. Similarly, pouring at too low a temperature is not conducive to good results. In the opinion of R. D. Voshall, superintendent of equipment and buildings, 915 deg. F. and 850 deg. F. are limits between which it is desirable to do babbitting.

To accomplish this the company has installed in its P Street shops a Westinghouse electric babbitt pot with a Brown pyrometer to regulate the temperature. This is set at 900 deg. F. and is arranged to cut in at 2 deg. below that or cut out at 2 deg. above. The railway has found that the use of this apparatus is enabling it to effect economies in bearing maintenance that more than offset the cost of the outfit.



This Babbitting Outfit in the Shops of the Washington Railway & Electric Company Has a Temperature Range of Only 4 Deg.

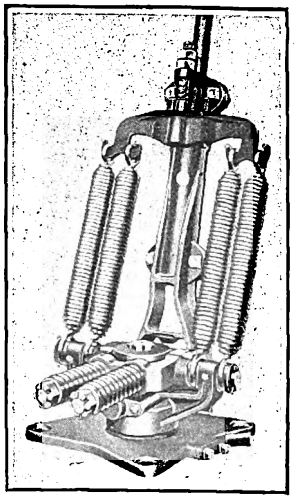
New Equipment Available

Trolley Base with Roller Bearings

A DESIGN of trolley base with several interesting features is being placed on the market by the Ohio Brass Company, Mansfield, Ohio. Standard Timken roller bearings have been embodied in the main bearings between the turret and the center of the stem casting. Two sizes of roller bearings support the base. The top one can be lifted off with the housing.

The base is fully bushed throughout at wearing parts and the tension springs, of which four are used, are held on bearing sleeves and forked casting bearings, which are also bushed.

The pole is held in place by two bolted clamps, with a long support to provide a firm grip. The pole is held in its down position by a latch



New Type Trolley Base

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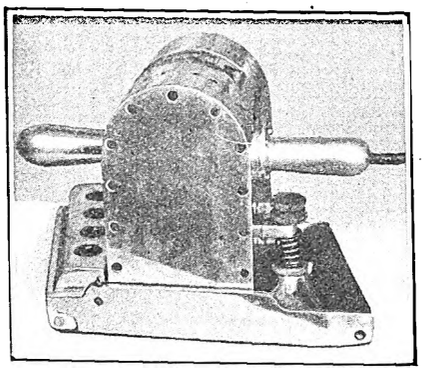
which engages with forked castings. The pedestal housing has a solid phosphor bronze brush, held against the pedestal post by a spring. This brush is electrically connected to the outside of the housing by a laminated copper jumper. The current is thus carried through this contact instead of through the roller bearings. A leather cup washer below the bottom bearing acts as a grease seal. The base is applicable to both city and interurban service. It weighs but 110 lb. and provides a uniform tension, regardless of the height of the trolley pole.

Portable Electric Sander

A NEW type of portable electric sanding and grinding machine which is said to do hand work at machine speed is being placed on the



New Type of Portable Sander

market by R. L. Barker & Company, Chicago, Ill. The outstanding mechanical features include gears and ball bearings which are totally inclosed in dustproof compartments and run in oil. A universal motor of about ⅛-hp. rating is used for driving. This also is mounted in a dustproof compartment. Motors for operating on either 110 or 220-volt circuits can be furnished.

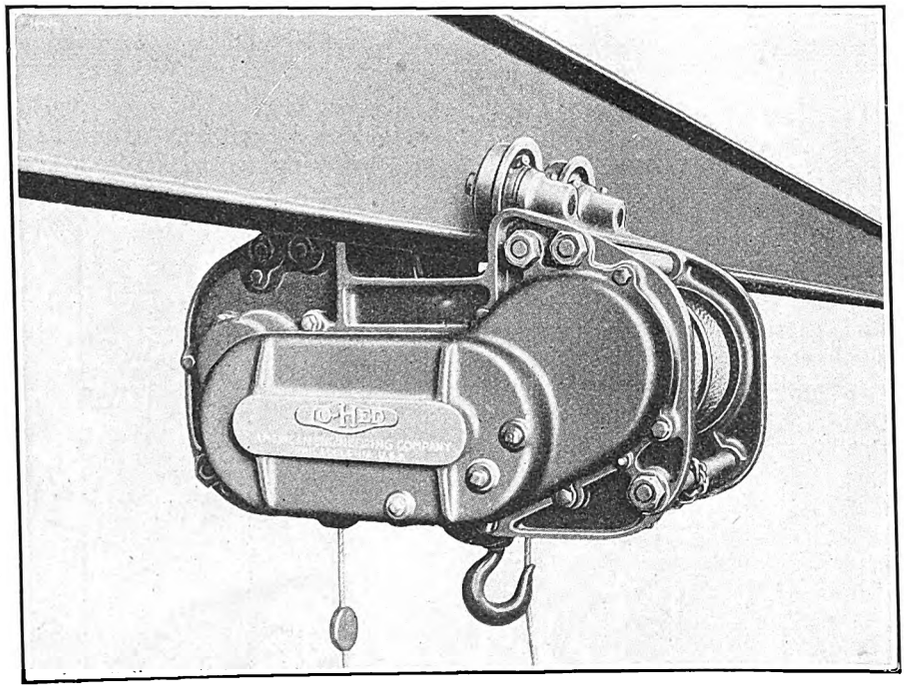
The drum around which the sand or emery paper is clamped is dynamically balanced with all parts inclosed in the upper housing. The base is provided with rollers to guide the machine over the work, and the depth of cut can be accurately adjusted by means of a screw attachment underneath one of the handles. When the work of sanding or grinding is finished, a spring raises the machine from the work, so as to leave no mark. Metal abrasive paper can be used and applied in place of sandpaper, so that the machine is suitable for any kind of flat grinding as well as sanding. The cover is arranged so that all dust is held in and does not fly about the shop. The machine complete is 9 in. x 10 in. x 15 in. and weighs 23 lb.

Low Headroom Hoists

A LINE of electric hoists designed particularly to operate in locations with minimum headroom has been placed on the market recently by the American Engineering Company, Philadelphia, Pa. These hoists operate on a monorail with a minimum free space underneath the beam of from 10 to 15 in., depending on the size used. The motor and drum are arranged on opposite sides and parallel to the I-beam rail and the load block can be drawn up between them into the body of the hoist to within 1 in. of the bottom of the rail.

Accessibility of all working parts has been given particular consideration. Outer covers are provided which can be removed easily for inspection of parts and the motor can be taken out without removing the main frame or body of the machine. All gears are of drop-forged steel, and positive automatic lubrication is provided for all bearing parts. Hyatt high-duty bearings are used on the gear shaft and in the trolley wheels. An automatic lowering brake, a holding brake and an upper limit switch are provided to insure safe operation, and the brakes take effect instantly so as to stop the load without drift.

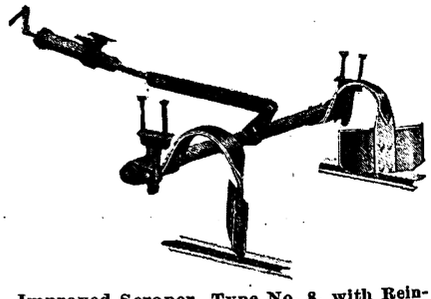
The hoist, which is being marketed under the trade name of "Lo-Hed," is built in capacities of from 1,000 to 12,000 lb. There are five types, four of which are arranged for operation from the ground. The fifth type is cab-controlled and has a motor-driven trolley.



Gear Side of Hoist Showing the Low Headroom Features

Improved Snow Scrapers

TWO new types of snow scrapers for electric railway cars have been designed by the Root Spring Scraper Company, Kalamazoo, Mich. The No. 8 scraper is an improvement over the No. 7 and is designed particularly for safety cars and other types with low bodies. The improvements include reinforced spring



Improved Scraper, Type No. 8, with Reinforced Springs and Improved Blades

wrappers to give added strength for removing wet or hard packed snow.

A new design, type No. 9, has been brought out particularly for cars with higher bodies than the safety car type. The springs are 4 in. shorter than those of the No. 8 scraper. The material in the spring is high carbon steel with tungsten and other ingredients which, when oil tempered and drawn, make them tough and prevent crystallization.

The springs of the scrapers are shaped so that they yield when going forward or backward, but will not turn under the car.

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The News of the Industry

Pay Increases Refused

Employees of San Francisco Municipal Property Told Company Is Without Funds—Ordinance to Seek Adjustment

Three groups of employees of the San Francisco Municipal Railway, San Francisco, Cal., have been refused raises in pay by the Board of Public Works and the matter is now in the hands of the Supervisors, to which body all power to change salaries has been delegated by a recently adopted amendment to the city charter.

Charles E. Stanton, a member of the Board of Public Works, told the representatives of the men at a conference held over the pay question:

"There is no money in the Municipal Railway's operating fund to meet the raises you demand."

To this F. P. Holling, president of the carmen's union, replied:

"You have lots of money. It's your bookkeeping system."

William Nanry of the Board of Municipal Research, supporting Colonel Stanton, declared that the proposed increase would add $296,000 a year to the payroll.

"If these increases are granted," he added, "the road will face an annual deficit of from $140,000 to $150,000."

Supervisor Rossi, the author of the charter amendment standardizing city salaries, then asserted that he will prepare an ordinance for introduction to the Board of Supervisors to classify municipal railway employees, thus paving the way for a salary adjustment.

The increases asked are as follows:

Platform men from $5.40 to $6.40 a day, car repair men from $6.40 to $7.40 a day and trackmen from $5.40 to $6.40 a day.

Political Careers in Balance

The San Francisco Supervisors find themselves placed in an embarrassing position. On the one hand, the Supervisors are advised by financial experts that it will create a deficit and throw the finances of the road into chaos if the demands are met. On the other hand, the Supervisors are faced with the problem of a coming election in which most of them will be candidates to succeed themselves. If they take a stand against the men it is possible that the labor element will back other candidates that will pledge more pay to the men. Labor, it must be remembered, holds the balance of power in San Francisco politics.

Another element to be considered is the taxpayer. His representatives have raised the cry that the road is losing money, that it will probably be in worse shape soon, with resultant higher taxes, and that the only solution of the difficulty is an increase in revenues. They are advocating a 6-cent fare.

Meanwhile, there are extensions that must be made if the road is to live up to its promises and keep up with the times. There is seemingly a lack of funds to make these extensions.

While the Supervisors are trying to find ways and means to meet the demands of the men George Lull, the city attorney, has been asked to rule on the question of the right of the Supervisors to take the matters of salaries out of the hands of the Board of Public Works and to decide whether or not the new charter amendment has been correctly interpreted.

Bus Regulation in Massachusetts Discussed

Street railways and bus companies are before the Massachusetts Legislature over the question of regulation. A hearing was held during the week ended Feb. 7 on the bill offered by Clinton Q. Richmond, general manager of the Berkshire Street Railway, to require bus lines to secure a certificate of convenience and necessity from the Department of Public Utilities, in addition to holding a license from the local city or town authorities. Day Baker, chairman of the legislative committee of the motor coach committee, offered a bill at the hearing which, in substance, concedes that the buses should be regulated, but places the power of regulation with the Department of Public Works instead of with the Department of Public Utilities. Wide differences of opinion are expected to develop over the selection of the regulating body. James M. Swift, counsel for the Motor Coach Association of New England, seems to reflect the feeling that if the right of regulation were reposed with the Public Utilities Department that body might be constrained so to regulate the buses as to make it impossible to expand in a way they deem is their right.

$603,000,000 Traction Ordinance in Chicago

Purchase Figures for Both the Surface Lines and the Elevated Go Before Council—Mr. Insull Discusses with Mayor Sale of "L" on Basis of $90,000,000

A MUNICIPAL ownership traction ordinance totaling $603,000,000 was submitted to the City Council of Chicago on Feb. 13, with conditions final except for the elevated lines terms. In a last-minute call on Mayor Dever, Samuel Insull consented to reopen negotiations for the sale of the elevated lines with his first definite price offer. The sum he fixed was $90,000,000. The ordinance as adopted by the traction committee carried a tentative price of $79,000,000 for the elevated. The ordinance is subject to referendum in April. It provides for the following expenditure by the city to be met entirely with notes: Surface Lines, $163,091,038; elevated inside city, $79,000,000; elevated outside city, $1,200,000; subway and extensions to surface lines and elevated, $360,000,000. There is an optional plan for additional subway and elevated construction by the city if Mr. Insull and the city cannot agree on the sale of the elevated lines operated by the Chicago Rapid Transit Company.

The fine hand of former Mayor William Hale Thompson, actuating the Federation of Labor mouthpiece in the Chicago City Council, had a few days before thrown into confusion a traction committee meeting, at which Mayor Dever presented the price figure for the purchase of the Chicago Surface Lines. The cardinal purpose—the setting of a price limit for negotiating with the elevated lines—was frustrated, however, and the committee subsequently adopted a figure submitted by Major R. J. Kelker, Jr., its engineer.

The Mayor had hardly completed the presentation of the surface lines terms of $162,000,000 than Alderman Oscar Nelson, a political stepchild of Thompson, adopted to keep the traction question in politics, sprang to his feet with questions taken literally from the Hearst newspapers. The Mayor strove to make himself heard over the babble and the pounding of Chairman Schwartz's gavel. The chairman asked the Mayor not to answer questions directed from outside the committee, but the Mayor insisted upon doing so. He prefaced his statements with the remark that nothing he would say could change Nelson anyway, but might help to inform other listeners.

The questions were typical of Hearst, Thompson and Hylan, full of innuendo and misstatements. A few hours before the meeting the Hearst afternoon paper came out with big headlines: New Joker Found in Car Plan." The "joker" turned out to be the legal form of the referendum proposition for the purchase and operation of the lines, which is prescribed by state law. That the opposition is based on demagoguery is evidenced by the fact that the hostile element is as bitter toward the company as toward the city and never offers a constructive plan to replace what it seeks to destroy.

The Mayor declared the deal whereby the city sought to acquire the finest

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traction system in the country without paying a nickel or obligating itself to pay a nickel regardless of the success or failure of the project was the most unusual in the history of finance. If the purchase fails, he said, the lines will be thrown into federal receivership in 1927.

"Chaos," he said, "will be at hand. Money could not be had and the lines would decay. We could not hope to get it out of receivership before 1930.

The Mayor departed when Chairman Schwartz told one of the intruding Aldermen that he had no time to waste on "a silly and insulting fool" and the row went on without the presence of the chief executive.

Chestnut Street Tube Ordinance Signed

Mayor Kendrick of Philadelphia, Pa., signed on Feb. 2 the ordinance authorizing the construction of the Chestnut Street surface subway under agreement between the city and the Philadelphia Rapid Transit Company. In a message to Council the Mayor told why he had signed the Chestnut Street ordinance. He quoted a record of approval of the subway project even extending back to the previous city administration. He explained that every dollar of the cost was to be returned to the city and said the project eliminated expensive proposals to widen the thoroughfare. Following the receipt of the message Councilman Walter, chairman of the transportation committee, moved suspension of the rules to place another transit ordinance on third reading and final passage. He then called up the ordinance granting the request of the Philadelphia Rapid Transit Company for permission, as the city's partner, to sell $10,000,000 of bonds of the issue of 1912 and to increase the interest from 5 to 6 per cent. These bonds have been used chiefly as collateral for short-time loans.

In connection with the bond proposal Coleman J. Joyce, counsel for the company recently explained that 100 cars and 213 buses were to be purchased and that the first payment would be $1,072,000. Next $60,000 would be spent on shop equipment, $128,000 on electric equipment and $270,000 on extension of track. In addition, $170,000 would be spent for improvements to tracks and other work in connection with the city street paving program. There would be $1,700,000 as additional capital left for other improvements.

Rerouting and Through Routing in Pittsburgh

In a decision made public on Feb. 4 by Chairman Charles A. Findlay of the Pittsburgh Traction Conference Board, Pittsburgh, Pa., rerouting and through routing of cars of the Pittsburgh Railways, are authorized for a period of 60 days. This matter of short routing as proposed by the company has been the subject of discussion for many weeks. The board explains that the schedule which it has prepared has been arranged to maintain the best possible service for the largest number of riders, and at the same time to reduce as far as possible the number of cars passing through the areas of greatest congestion.

The report stated that the unprecedented increase in vehicular traffic during the past few years had made it impossible to conduct a satisfactory system of transportation over the routes now operated in the congested section of Pittsburgh, because of insufficient street area. The opinion said that it was not unusual for a car with a schedule of 12 or 14 minutes to consume from 30 to 40 minutes in negotiating the congested area.

The rerouting plans offered two elements of possible relief: First, the introduction of fewer cars in the congested area of the triangle; and second, rerouting. The report stated that the changes involved in the proposed plans were advanced as a tentative method of meeting difficulties in the downtown section.

Following the announcement by the railway officials that the plans would be placed in effect "in about a week," the downtown merchants said they would "fight to the last ditch" to prevent the modified short looping plan.

Petition Filed for Buses in Richmond

The Virginia Railway & Power Company has petitioned the Common Council of Richmond, Va., requesting that body to adopt an ordinance granting the company permission to operate 8 bus routes extending to every section of the city and suburbs. The company say that if the Council acts promptly it is prepared to start its supplemental bus service as soon as the equipment can be obtained.

Coincident with the company's plan to obtain an ordinance, announcement was made that the Richmond Rapid Transit Corporation, an independent bus line, would fight to the limit the entry of a competitor in the motor transportation field. H. V. Godbold, vice-president of the corporation, said that his company would protest the granting of a permit; that he held a 30-year franchise, and that he stood ready to extend bus service to any part of the city that the Council might require. He said he believed that the Council would protect the interests of a pioneer in the local bus transportation field.

It is the contention of the railway that the ordinance requested by it would not necessitate any action for which the Council has not established a precedent. An official of the company pointed out that the Council had granted the Rapid Transit people permission to parallel the street car lines on Broad Street and that the railway company in turn was merely asking the right to parallel the bus lines in the West End section.

The railway company emphasized the fact that it was offering the public the bus-to-street-car transfers which the bus corporation was unable to meet. In the case of a transfer from a street car to a bus the passenger will be required to pay the difference of 2 cents between the fares. If the plan is adopted it is said that it will establish a remarkably inclusive transportation system, embracing the suburban sections of the city.

Important Improvements in Track at Montreal

Formal announcement has been made of some of the new work to be carried out by the Montreal Tramways, Montreal, Que., hinted at in the ELECTRIC RAILWAY JORNAL for Jan. 24, page 162. Perhaps the principal work in sight during the coming season is for the relief of congestion in the downtown districts. For some time past the company had been considering plans to relieve congestion in the main arteries of trade downtown and these plans are now being considered by the Montreal Tramways Commission, the executive committee of the city and the officials of the company.

A terminal loop will be built around the Power Building on Craig Street, so that cars from east and west, as well as north, will turn around the new loop. A sheltered transfer station is to be built at this terminus.

In order to carry out this work, the tramway has bought the properties extending from the Power Building on Craig Street to Cote Street, and also at the northeast corner of St. Urbain and Craig for a distance up St. Urbain.

This will make room for cars to run on a loop from St. Urbain to Cote Street around the block, all cars on this loop stopping at the new covered waiting platform which is to be at the corner of Cote and Craig Streets, the old buildings now at that corner to be pulled down.

Franchise Discussion Revived in Columbus, Ohio

Members of the City Council of Columbus, Ohio, recently authorized Councilman Henry Worley, head of the utilities committee, to reopen negotiations with the Columbus Railway, Power & Light Company, Columbus, Ohio, in an effort to obtain a 25-year franchise, to become effective upon the expiration of the present contract on Feb. 1, 1926.

Representations of the city are agreed upon fixing a ticket charge based on the actual cost of carrying passengers plus a fair return on the property value. They also would have the rate question readjusted every 5 years. Another plan is to have present car lines extended according to the increase in population as against a maximum of 10 miles a year proposed by the company in a former meeting.

It is said that representatives of the city favor seeking to require the company to continue its former method of assisting in the paving of streets in which there are tracks by caring for the street between the rails as well as 1 ft. on each side.

Wages Increased. — P. J. Murphy, vice-president and general manager of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., known as the Laurel Line, recently announced an increase of 2½ cents an hour in the pay of trainmen retroactive to Dec. 1, 1924. He said that by the terms of the new scale the men of the Laural Line would receive 69 cents an hour. A number of minor changes were made in the working conditions.

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New Era in Utility Relations in Dallas

Dallas, Tex., has recently been through a period of inquiry with respect to the need for continuing the 6-cent fare on the lines of the Dallas Railway. The whole proceeding was most amicable, and this has led the Dallas *Dispatch* to contrast the present situation with the one that existed 10 years ago. That paper said that those who recall the acrimonious days of 10 years ago when the railway and light companies' affairs were a matter of the most intense public interest will read of the 6-cent fare hearing with interest and satisfaction. As that paper saw it, the outstanding feature of the inquiry was the frankness and directness of Messrs. Hobson, Meriwether, Worsham and others intimately connected with the management of the railway. The *Dispatch* said:

> It was quite palpable they were dealing with the public's representatives openly and above-board. It is well. The city and the car company have the same aims. The city wants good service from a profit-making street car system. The company wants to give it because it knows that that is the real way to continued success. The city is willing to pay for good service and the company perhaps would not take a higher fare than 6 cents, even if it could get it.
>
> The Dallas *Dispatch* has frequently said that the greatest contribution made to the development of Dallas in 20 years was the settlement of the public utility problems started by Henry D. Lindsley as Mayor. He lost his political life bringing about the present satisfactory conditions, and incidentally Dallas thereby lost its most valuable public servant and citizen. But the good that men do lives after them and this applies also to Henry D. Lindsley, now a resident of New York.
>
> Another outstanding feature of the investigation was the dominance of the city of Dallas brought about by the unequaled public service of John W. Everman, city supervisor of public utilities, and his assistants. The people, the City Commission and the traction interest equally benefit by his demonstrated fitness for his position.

Approves One-Man Cars in Little Rock

A protest against the operation of one-man cars in Little Rock, Ark., was overruled by the Public Utilities Committee of the Little Rock City Council at a recent meeting. The report of the committee on the protest against the operation by the Arkansas Central Power Company of the lately installed one-man safety cars was brief and in favor of the use of the new cars. The report was adopted by a unanimous vote.

L. P. Newton, local attorney, representing the protestants, outlined the objection to the one-man cars. He contended that the use of the cars was an inconvenience to the public; that it interfered with the enforcement of the "Jim Crow" law and that the operation placed too much responsibility on one man.

Five motormen who have been operating the new cars since they were installed Dec. 25, testified that their duties were less burdensome than under the two-man system; that the schedule was being maintained without difficulty, and that they had experienced no trouble in segregating white and negro passengers.

The report of the committee said in part that after hearing all evidence introduced by both sides it was of the opinion that, while there was some confusion and delay during the first few days in the operation of the cars, the company had eliminated the causes and the cars are now being operated on schedule. The committee was further of the opinion that the company was to be commended for its efforts to provide the most modern and adequate facilities.

New Idea in Coach Service

A no-transfer motor coach route from the Hill district to the business section of the City of Toronto, Ont., is to be started in the spring by the Toronto Transportation Commission. The service, which will consist of single-deck buses run at a 10-cent fare, will tap districts where patrons travel in their own cars. Heretofore, the bus has been used in Toronto merely as a railway auxiliary and has provided service on outlying routes in Rosedale. The new service will, in a sense, compete with the T.T.C., but actually it is designed to secure traffic which the tramway company does not now get at all. D. W. Harvey, general manager, said that this new service would be self-supporting and its accounts would be kept separately from the railway accounts. He said the purpose of the new line was entirely different from the company's bus activities in the past and it was his belief that inasmuch as the coaches would serve passengers who now use their own cars the downtown parking situation would be greatly relieved.

Buses Get Through When Railway Suspends

The New Jersey Interurban Traction Company, Washington, N. J., on Feb. 7 abandoned efforts to clear its line, discharged the men who have been shoveling snow and started a bus running between Port Colden and Phillipsburg. Three more buses are to be added. Permission will be asked of the Public Utilities Commission to extend the bus service to Hackettstown, 10 miles east of Washington, to Oxford and to High Bridge.

The trolley line, 20 miles long, was built 30 years ago. The original organization, the Easton & Washington Traction Company, went into bankruptcy. The road was taken over by the Northampton, Easton & Washington Traction Company and that in turn was superseded by the present corporation.

The trolley fare was 7 cents for each of the seven zones, but the rate will be increased to 10 cents on the bus.

Baltimore-Washington Bus Permit Refused

The Public Service Commission of Maryland has refused a permit for the establishment of a de luxe bus line between Baltimore and Washington. It holds that present transportation facilities are adequate and that the traffic on Washington Boulevard already is unduly heavy. The proposed bus line would have come into competition with the one electric line and the two steam railroads operating between the two cities.

Rates Working Out Satisfactorily

In its annual report submitted recently to Governor Silzer the Board of Public Utility Commissioners of New Jersey said that the rates now charged by the Public Service Railway were working out to the satisfaction of the public and to the advantage of the company better than would be the case had an attempt been made to overcome the deficit by charging a higher basic fare. The commission sees no improvement in the condition of street railway lines operating in and between the smaller municipalities. This it attributes to increases in operating costs, development of the bus and the increasing use of private automobiles.

The report says it is a matter of grave concern that several railways have been compelled to abandon franchises and discontinue service and that the largest company, the Public Service system, has failed to earn an adequate return under a system which the commission regards best adapted to conditions under which it operates.

More Rental Would Mean More Development

Thomas E. Mitten, chairman of the board of directors of the Philadelphia Rapid Transit Company, Philadelphia, Pa., recently offered the city of Frankford more "L" rental if the money were applied to improve land in the northeastern part of the city. The additional rental of about $110,000 would begin in 1926 and would be sufficient to release $13,000,000 of the city's borrowing capacity. The $13,000,000 represents the city's investment in the construction of the "L." If these suggestions are carried out much unimproved land in that section of the city will be made available for homesite development. An additional rental of $110,000 would bring the P. R. T.'s annual payment for the "L" to $830,000. Its total additional payments during the remainder of the life of the 50-year bonds issued for the construction of the "L" would be about $5,000,000.

Rochester in Throes of Bus Fight

Rochester has a miniature bus war, with the New York State Railways and the Ridge Road Bus Line as the contestants and the Common Council as the referee.

The Ridge bus line operates from Rochester to Hilton, over a 20-mile route. Recently the line ended its run at the union bus terminal in the heart of the city. The New York State Railways, contending that the bus company's franchise did not call for service within the city limits, caused the buses to be halted at the edge of the city. The traction company maintained that the bus men must obtain a state certificate or special franchise. James J. Dadd, secretary of the Auto Bus Association of New York State and manager of the bus terminal, met this statement with the charge that the railway has not furnished adequate transportation for the residents of the Ridge Road section. An ordinance which would allow the buses to end their run at the terminal has been introduced into the Council.

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Monongahela-West Penn Operations Enlarged

Final steps have been taken in a plan which will link together in one system a number of the large electric light and power companies operating in West Virginia, Ohio and Maryland. To this end a consolidation and unification of all the electric light and power companies of the West Penn System within the three states had been effected. This was done through the transfer of the properties concerned to the Monongahela-West Penn Public Service Company. The properties and assets thus involved were of the Brooke Electric Company, which operates in Brooke, Hancock and Ohio Counties, West Virginia; the West Virginia and Maryland Power Company of Preston, Taylor, Barbour, Randolph and Mineral Counties, West Virginia; the Parsons Electric Service Company of Upshur County, West Virginia; the St. Mary's Power & Light Company, Pleasant County, West Virginia, and the West Maryland Power Company of Garrett County, Maryland.

The Monongahela-West Penn Public Service Company, already operating in Monongalia, Marion, Wetzel, Tyler, Wood, Harrison, Lewis, Barbour and Braxton Counties, West Virginia, and Washington County, Ohio, will be made by the acquisition of the largest public utility corporation in West Virginia. The West Penn Company, which is controlled by the American Water Works & Electric Company, Inc., of New York, is likewise the owner of the West Penn Power Company, the West Penn Railways and the Wheeling Traction Company, together with their subsidiaries. Operation and management of the enlarged Monongahela-West Penn Public Service Company will continue under the administration of Capt. George M. Alexander, president, with headquarters at Fairmont, W. Va.

Gasoline and Weight Tax Bills Passed in Michigan

The 2-cent gasoline tax bill and the 55-cent weight tax bill have been passed by both houses of the Michigan Legislature and will be given immediate effect upon signing of the Governor, considered a certainty. The weight tax bill taxes passenger cars 55 cents per hundredweight and trucks on a graduated scale from 65 cents per hundredweight up to 2,500 lb., to $1.25 on trucks of more than 6,000 lb. The weight tax is expected to raise about $14,500,000 and the gas tax about $6,500,000.

Carhouse Held Up at Chicago

Desperadoes staged a spectacular robbery in the Chicago Surface Lines Leavitt Street carhouse early in the morning of Feb. 2. They are said to have got away with $9,000, the receipts of late Saturday and Sunday. At 2:30 o'clock in the morning the leader slid off a 10 ft. steel inclosure, dashed through three offices and confronted David Jones, cashier, with a gun. Six other bandits followed. They slid the nickels, dimes and other coins into canvas bags, tied them and passed them outside. Two conductors in the next room would have known nothing of the robbery but for a rifle pointed at them while the bandits worked. The robbery is the first of its kind in Chicago since the notorious trio of 1903 killed two employees and two detectives and withstood a long siege in the Indiana dunes. In the round-up following the recent robbery three former employees of the lines were arrested.

Effective Good-Will Ad in Atlanta

As part of its campaign of general public utility advertising the Western Electric Company recently used in the Atlanta, Ga., papers copy that was distinctly appropriate. The appeal to

Some Facts for the Public to Ponder

Atlantans was to mix a few street cars in the mortar of new construction. The ad carried its own message, the purport of which was that it would pay every Atlantan to see to it that the railway is put on a basis where it can extend and improve service.

Claim Agent Discusses Fakers in Daily Paper

Trevor C. Neilson, claim agent of the East St. Louis & Suburban Railway and related lines, East St. Louis, Ill., and president of the Mid-West Claim Agents' Association, was interviewed recently by James B. Clendenin of the East St. Louis *Daily Journal* on the subject "How Accident Faker Preys Upon Street Railways." He reviewed a number of accident cases entitled to a settlement for claims and some of the false ones that were either perpetrated or attempted. In the course of his article Mr. Clendenin said:

And despite the machinery that is at work in the war on fakers, some of them still get away with it, but not in the numbers of former years, in which there was no satisfactory contact between the claims departments of the various utilities.

While any number of the evils of antiquated systems of handling claims have been remedied, a number still exist that only the legislative branch of the state government can eliminate, it is Neilson's opinion. The most stubborn obstacles still in the way to a fair settlement for both sides is the Illinois law which makes it impossible for the defendant to force a medical examination in cases where claims are made for physical injuries.

Cities of New York State Favor Bus Bill

The legislative committee of the New York State Conference of Mayors, at a meeting held at Albany on Feb. 5, went on record as favoring the "purpose and principle" of the Walker-Bloch municipal bus bills which, introduced at the request of the Hylan administration, would give to New York and other cities the right to own, operate or lease municipal bus lines. The 5-cent-fare provision did not meet with the approval of the entire committee. The committee opposed a bill which would make the officials of any city individually liable for damages caused by buses which were being operated without a certificate from the Public Service Commission. This measure is said to be aimed at the Hylan buses in New York, which are being run without the consent of the Transit Commission or the Public Service Commission.

Trainmen at San Diego Receive $10,870 in Accident Awards

Claus Spreckels, vice-president and general manager, recently presented to the trainmen of the San Diego Electric Railway, San Diego, Cal., checks totaling $10,870 as a prorated bonus based upon each man's accident record for the year just closed. Thirty of the men were rated at 100 per cent. Each received a check based upon the hours he had served during the year.

The gifts were distributed at a meeting that followed a dinner by Mr. Spreckels to the department heads at the San Diego Hotel. A feature was the presentation for Mr. Spreckels of two beautiful watches to J. C. Boronda and T. H. Bailey, in celebration of their completion of 20 years of service with the company. The presentation was made by M. J. Perrin, who recently started his 38th year of service with the company.

Mr. Spreckels presided. He pointed out that it is the aim of the railway to assist in the city's growth by furnishing transportation that will permit the city to expand and attract additional population. He said that the railway can prosper only as the city prospers. Part of his plea follows:

You employees can influence the growth of our city, the success of the company, and consequently your own prosperity more than you realize. The ballot is one of your most effective tools. When you cast your votes in any city election, do it with the single idea of benefiting the whole city. Do not consider an individual personal benefit which may jeopardize the general welfare.

In your public relations, too, you can help San Diego grow. Choose the right men to govern the city; help them with your ballot to make it grow; give the public the best that is in you, and your little piece of real estate or your job will be worth more. You will profit, and so will the company. And the city will profit most of all.

Large Capacity Buses Under Consideration in Seattle

Plans for equipping feeder lines to the Seattle Municipal Railway, Seattle, Wash., with buses like those now in use in Chicago, Detroit, New York City and other Eastern cities have been laid before the Seattle City Council by representatives of one of the bus builders.

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News Notes

Bus Operation in Greensboro.—The Greensboro Bus Company, a newly organized subsidiary of the North Carolina Public Service Company, Greensboro, N. C., recently started the operation of three buses supplementing its railway service. The bus service will accommodate residents in this vicinity not reached by railway lines. Buses are of the latest 22-passenger street car type, manufactured by Graham Brothers of Detroit. The fare on the buses is 10 cents, and free transfers are given passengers from buses to the street cars. A charge of 3 cents will be made when passengers enter the bus with a transfer received from the street cars at Jefferson Square.

Serious Accident on "L."—Two people were killed, six seriously injured and 50 received treatment for bruises when a southbound five-car shuttle train of the Interborough Rapid Transit Company telescoped another train early on Feb. 9, ramming into a stationary Third Avenue "L" express on the White Plains Road. The train was traveling through a very heavy fog which hid a sharp incline leading down to the 219th Street station. The collision caused a tie-up in service of 6 hours. Engineers of the company declared that the veteran motorman who lost his life had been guilty of violating a rule of the company which prescribes strict conditions for operation during a fog.

Indianapolis Company Purchases Bus Company.—The Indianapolis & Cincinnati Traction Company, Rushville, Ind., has purchased the Indianapolis-Shelbyville bus line from its owners, Harry J. Lay of Ridgeville, Ind., and Roy C. Lee of Shelbyville, Ind. Hudson R. Biery, assistant to Charles L. Henry, president of the traction company, said that aside from giving the public better service on the bus line little change would be made in its operation. Eight trips each way are made daily by the bus line.

Buses Will Supplant Railway Cars.—Notices have been posted in the cars of the Cumberland & Westernport Electric Railway that within the next 60 days railway service will be discontinued on the run between Frostburg and Cumberland, Md., in favor of bus service. Railway service on the Frostburg-Westernport end will be continued.

Bus Privilege Extended.—The Oskaloosa Traction & Light Company, Oskaloosa, Ia., has been granted a 90-day extension of the bus privilege now operative in First, Fifth and Fourth Wards. The extension was granted pending the placing of a franchise amendment before the voters of the city at a special election to be held as soon as it can be lawfully handled.

Official Takes Vacation.—Thomas N. McCarter, president of the Public Service Corporation, Newark, N. J., and Mrs. McCarter sailed on the S.S. *Rotterdam* on Feb. 4 for a trip to the Mediterranean. They will be gone until about April 15. This is the longest vacation Mr. McCarter has taken in 35 years. He plans to leave the ship at Naples and motor to Paris, then to catch the Rotterdam at Boulogne to rejoin the cruising party.

Rapid Transit Course to Be Given.—Another institution which feels the need of offering instruction in rapid transit development is the College of the City of New York, School of Technology. This school will offer a special course in rapid transit and traffic, according to an announcement of Dean Frederick Skene. Aside from the study of construction of new lines, especially underground, emphasis will be placed on the means whereby the present trackage can be made most useful. The Board of Transportation, through Commissioner Delaney, its chairman, has approved the course and recommended George Abraitys, chief of the designing division of the board, to give it.

Line Will Continue.—The Washington-Virginia Railway, Washington, D. C., will be continued in operation indefinitely. This was decided on Feb. 5 by a committee representing about 90 per cent of the bonds outstanding. It had been expected that the line would discontinue operation following the granting of a permit to R. L. May to operate buses between Alexandria and Washington and the subsequent denial of a similar permit to the railway by the Virginia Corporation Commission. The company has asked a permit to run the bus line between Alexandria and Washington as a feeder for the cars which are operated to Fairfax, Falls Church and Mount Vernon.

Bus Permit Extended.—The Charleston Interurban Railway, Charleston, W. Va., was recently granted a 4 years' extension on a permit by the City Council for operation of a bus line to the Upper Glen Elk district of the city. Originally the permit was for one year. The company did not consider a one-year permit sufficient to warrant the necessary investment of more than $25,000 that would be involved to provide adequate equipment.

Interurban Meets Steam Line Rate.—The Illinois Commerce Commission has authorized the Illinois Traction System to publish on one day's notice a rate of 91 cents per ton on coal shipments between Springfield and Decatur, Ill. This is a reduction of 10 cents and permits the interurban line to meet the steam railroad rate.

Conference to Discuss Transit.—The Cincinnati, Ohio, Rapid Transit Commission has adopted a resolution inviting representatives of the Cincinnati Street Railway and the Cincinnati Traction Company to a conference to be held on Feb. 20 for the purpose of discussing the transit situation. The resolution was offered following a statement by John V. Campbell, attorney for the commission, who said that he thought representatives of the two groups should be asked to discuss the leasing of the transit loop. Any agreement reached would have to be first submitted to the Council and later to a popular referendum. This referendum might be held during the August primary, and could certainly be held at the November election.

Experiments with Sunday Pass.—Because receipts on Sundays fell far below the cost of operation, the Charleston Consolidated Railway & Lighting Company, Charleston, S. C., recently started the Sunday pass, as an experiment for 10 Sundays. The passes are sold for 25 cents each.

Wage Increase Sought in Des Moines.—An increase in wages has been suggested by trainmen of the Des Moines City Railway, Des Moines, Iowa, when the present agreement expires on March 1. The present scale is based on a 59-cent hour with insurance and pension features secured under an arbitration board recommendation last year. The company contends that there can be no reduction in fares as long as operating expenses continue at the present level. F. C. Chambers, president of the company, has suggested increased use of one-man cars and the co-ordination of buses with the railway.

Employees 100 per Cent for Safety.—All operators of the cars of the Knoxville Power & Light Company, Knoxville, Tenn., have enrolled in the Safe Drivers' Club, which was recently organized, the total membership of which is now 305. The red emblem recently appeared on the windshields of autos and street cars on the streets of Knoxville, indicating that owners and operators are members of the club, and that their aim is to reduce the number of accidents. Formation of the club was urged by the Knoxville *Sentinel* in conjunction with the Knoxville Automobile Club.

Railway Refused Bus Certificate.—The Public Service Commission has refused the application of the Mauch Chunk & Lehighton Transit Company, Mauch Chunk, Pa., for a certificate to operate a bus line between Mauch Chunk and Weissport. The commission said that the company's application was for operating rights over a route already provided with service by George Arner. The railway sought to discontinue its line from Flagstaff Park to Mauch Chunk and Lehighton.

A More General Bill to Be Introduced.—Instead of the bill recently introduced to permit the Jacksonville Traction Company, Jacksonville, Fla., to operate buses charging a fare of 10 cents, the laws and rules committee of the City Council will recommend an amendment to the present "jitney bus" ordinance which will allow any one to operate buses provided operators execute a bond for the protection of property and passengers. It is expected that the bond will be $5,000.

Weekly Pass in Leominster.—The weekly pass has been put into effect by the Worcester Consolidated Street Railway in Leominster, Mass., for a trial period of 3 months with the approval of the Massachusetts Public Utilities Department. The plan provides for the issuance of a pass at a cost of 75 cents. The city of Leominster, with a population of 20,000, has a 7-cent fare from the center to limits beyond the edge of town, or 14 cents across. The pass is good for a limited area around the center sufficient in extent to take care of practically all riding from factories, offices, stores and homes.

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Foreign News

New Zealand Property Has Successful Year

Christchurch Tramway, Christchurch, N. Z., had a deficit in its operations for the year ended March 31, 1924, of about £7,000, which will be more than covered by the amount carried forward. Christchurch Tramway, the largest tramway undertaking in the dominion, consists of 78 miles of single track and has an annual revenue of approximately £261,000. As it is a publicly owned concern, it is the policy of the Tramway Board not to make a profit, but so to arrange its finances as to produce the barest possible surplus, at the same time stating that the trams must pay their way and not become a burden on the rates. On March 31, 1922, there was a surplus of £4,009. At the same date in 1923 it was £6,527, giving a total of £10,536 and leaving a balance of £10,271 carried forward to the 1924 account. The number of car-miles run was 3,374,000, a decrease of about 84,000. The passengers carried totaled 25,450,000, an increase of about 350,000.

In his report, which antedated the closing of the year by about one week, A. S. Taylor, chairman of the Christchurch Tramway Board, discussed at length the fare situation in the past and offered some suggestions for the future. On the subject of bus competition he said the board's experience in that direction had not been a fortunate one, and further, that losses had been made both on the Hornby and South Brighton buses. He suggested the board considering the advisability of obtaining a fleet of half a dozen buses which could be used to test new routes.

Electric Buses for Lyons

Tramway service in Lyons, France, has recently been supplemented by the establishment of a bus line, after consideration of several types of vehicles. During 1923 a test was made of an electric storage battery bus of a type similar to those in use in Rome, Milan and other Italian cities. Following this successful trial it was decided to adopt substantially the same design for the new vehicles.

Electrical equipment was furnished by Rognini & Balbo of Milan and the mechanical equipment by De Dion-Bouton. This storage battery bus has five forward and two backward speeds. The speed is varied by changing the motor connections without making any change in the mechanical transmission. The controller is actuated by a pedal. Power is furnished by two motors mounted just back of the rear axle, one motor driving each rear wheel. Seats are provided for 28 passengers, while standing space for 12 more is provided on the rear platform. The bus is operated by two men, the driver being in a closed compartment at the front.

The new service was inaugurated by M. Herriot, now Premier of France, and formerly Mayor of Lyons, on the fifteenth anniversary of the electrification of the suburban lines.

British Tramway Statistics

There are 243 tramway undertakings in Great Britain, operating 2,624 miles of track, according to the annual return of the Ministry of Transport for the year ended Dec. 31, 1923, for municipal properties, and March 31, 1924, for privately operated companies. Of this number municipal authorities operate 170 undertakings, comprising 1,839 miles of track, and 73 companies, totaling 785 miles of track, are privately operated. The capital expended by local authorities was £71,341,947 and by private companies £20,876,610, the total being an increase of £3,128,053 as compared with the previous year. The total gross receipts were £29,433,647 and the expenditures £22,882,028, leaving net receipts of £6,551,619, or a decrease of £880,999 as compared with the previous year.

The net income available for distribution was £7,956,147, out of which £2,195,039 was appropriated for interest and dividends, £1,913,930 for payment of debts and £2,143,066 for reserve and renewal funds.

The number of passengers carried was 4,443,326,581, an increase of 2.18 per cent; the number of car-miles operated, 363,057,881, an increase of 3.17 per cent, and an increase of 5.31 per cent in electric energy used. The average receipt per passenger was 1.53d. as compared with 1.66d. the previous year.

The municipal tramways received from local rates the sum of £256,777 and contributed in relief of rates £280,537. The tramways requiring most help were those of municipalities in the outskirts of London, where bus competition is intense. West Ham required help to the extent of £63,000; East Ham, £35,000; Croydon, £18,000, and Walthamstow, £15,000. Of the tramways operating at a profit the most successful were Leeds, which contributed £65,000 to the relief of local rates; Birmingham, £27,000; Cardiff, £22,000; Hull, £21,000, and Blackpool, £15,000.

Travel in Berlin Falls Off

During the first 11 months of 1924 passengers on the various transportation lines in Berlin, Germany, numbered a little more than 1,231,400,000.

THOUSANDS OF PASSENGERS CARRIED IN BERLIN, JANUARY TO NOVEMBER, INCLUSIVE

	1924	1923
Stadtbahn	565,000	850,000
Elevated and subway	162,000	153,589
Surface railways	462,800	278,476
Omnibuses	41,635	21,730

This was a slight decrease from the 1,304,693,000 of the previous year. There were very notable changes, however, in the distribution of this travel, as shown by the accompanying table.

New Route Number System for Glasgow

A new system of route numbers on the municipal tramcars of Glasgow, Scotland, came into use on Oct. 1, 1924. These numbers, which are displayed at the top of the center vestibule window at either end of the car, indicate the destination as well as the route. For example, on the Ronken Glen route all cars turning at Shawlands, the nearest terminal from the center of the city, display the number 2. Cars turning at Newlands show 2A, at Merrylee 2B, at Giffnock 2C, and those going all the way to Ronken Glen show the number 2D.

The numbers are also being displayed at the most important stopping places, and a small map showing the numbering of each route has been prepared for the public.

Paris Metro Subway Fined. — The Metropolitan and Nord-Sud subways in Paris have been fined 600,000 francs for their failure to supply their temporary employees, as well as regular employees, with old-age pension books. The case has been in the courts for more than 2 years, but unless the companies appeal further the matter is now settled.

British Tramway Abandonments. — Buses are to be operated by the Sunderland District Tramways Company, Sunderland, England, the tramway rails removed and equipment sold, due to the bad condition of the equipment. Trackless trolleys will be substituted for tramways in Chesterfield. It would cost approximately £90,000 to put the tramways into proper repair and renew the rolling stock, while the cost of the trolley bus system is estimated at £39,000.

Weekly Pass Successful in Hull, England.—The number of weekly passes sold by the Hull Tramways has increased from 2,453 in the first week to 4,600 in the last week for which figures are available. The total tramway receipts, which had been decreasing, now show an increase over the corresponding weeks of the previous year. Reference to the installation of the pass in Hull was made in ELECTRIC RAILWAY JOURNAL, issue of June 14, 1924.

Bradford Proposal for Relief of Congestion. — Construction of terminal sidings near the curb at fare stages, with the necessary deflection of the car tracks, is now being considered by the Town Council of Bradford, England. It is thought that this will reduce obstruction to general vehicular traffic, caused by stationary tramcars in the middle of the street, thus relieving traffic congestion in a measure.

Electric Buses to Be Tried in Paris. —The Paris Transports en Commun is to experiment with a new storage battery bus, of the same type as those put in service in Lyons last October. It is expected that the electric bus will serve for suburban traffic running from the big centers, rather than general interurban traffic. The disposition of the French to develop the electric vehicle is to secure freedom from foreign sources of supply for liquid combustible.

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Financial and Corporate

Denver Reorganization Progressing

Committees Are at Work on Plans for Discontinuing the Receivership—Earnings Greatly Improved

Representatives of the stockholders, the holders of a defaulted $10,107,750 bond issue and holders of approximately $2,500,000 in notes of the Denver Tramway, Denver, Col., are working on the formulation of the reorganization program for the company. Tentative plans have been advanced to effect the rehabilitation on the basis of an assessment of $10 on each share of the $5,948,000 of stock outstanding, cutting the bonded indebtedness of $10,107,750 in half by substituting $500 in stock and a new $500 bond for each $1,000 bond of the defaulted issue and by the creation of an issue of preferred stock to be given to the holders of the collateral trust notes to the amount of $2,498,000 now outstanding. Other issues would apparently be left undisturbed.

Ernest L. Stenger, who has been in charge of the company as receiver, has been mentioned for president under the contemplated reorganization.

Interest has been paid during the receivership only on underlying securities. Interest has been defaulted on the first and sinking fund 5s, on the 7 per cent notes and on a $278,100 issue of Denver & Northwestern first and collateral bonds of 1932.

The net income of the company for 1924 was $261,000, as compared with $199,842 for 1923, a gain of 31 per cent.

It will be recalled that the federal court recently ruled that the city of Denver should be permanently restrained from enforcing fare contracts and ordinances and that the court construed the company's franchise as perpetual. At the same time the valuation of the company was fixed at a figure which permits the earning of a sum sufficient to warrant continuation of the present 7½ and 8-cent schedule.

Bearing on the movement for the reorganization is the fact that the company has shown a deficit only four months during the receivership and that its average net earnings have been $200,000 a year.

During that period interest amounting to $2,776,000 has been defaulted on bond issues, but $2,750,000 has been spent upon improvements and renewals.

Engineers Buy Attleboro Road

The Interstate Consolidated Street Railway, Attleboro, Mass., was sold at receiver's sale on Jan. 30, to Hemphill & Wells, New York City. This firm has also concluded negotiations for the purchase of the Attleboro Branch Railroad. It is planned to operate both properties as a single system. The two properties operate 30 miles of track.

The proposed new company will be a local industry under local management, including local business men among its directors. George W. Wells will be vice-president and general manager.

The firm of Hemphill & Wells consists of Albert W. Hemphill and Gardner F. Wells, who formed a partnership 6 years ago as consulting engineers specializing in public utilities. Both are Massachusetts Institute of Technology men and both were formerly with Stone & Webster. They are convinced that the Attleboro system can be put on its feet and made a permanently successful enterprise by applying modern methods.

The companies at Attleboro are operating, in conjunction with the United Electric Railways, Providence, R. I., two through bus lines. One of these runs between Attleboro and the center of Providence and the other connects Plainville, North Attleboro and the center of Providence.

It is planned to establish permanent bus service from Attleboro and North Attleboro to Pawtucket and Providence. This service will be co-ordinated with the trolley service.

Traffic and Revenue Lower in London, Ont.

The gross earnings of the London Street Railway, London, Ont., for the year ended Dec. 31, 1924, were $665,302, a decrease of $28,109 compared with 1923. This fact was disclosed in the report of the company submitted at the annual meeting on Feb. 4. The operating expenses were $546,364, a decrease of $25,718. Net earnings from operations were $118,938. After the deduction of fixed charges, depreciation and Dominion income tax, the balance of net income was $33,903. In 1923 this item was $42,166.

Although the net income for 1924 was $33,903, being an earning of 5.32 per cent of the outstanding capital stock, no dividends were paid for the year. On a mileage basis, the revenues show a decrease of six-tenths of a cent per mile operated as compared with the revenues per mile received during 1923. Charles Currie, president of the company, said that the funds representing the net income were used for capital improvements to the property. The company continued its policy of making improvements to its property, reconstructing and relaying trackage wherever the occasion demanded. The equipment was augmented by the purchase of two Peter Witt cars, making five cars of this type now in operation. Approximately forty cars were repainted during the year. In 1924 the number of passengers carried was 13,299,634, against 13,865,148 in 1923. The total number of passengers, including transfer passengers, was 15,048,868 in 1924 and 15,647,343 in 1923. The railway operated 36.10 miles of track.

Scope of Recent Merger

United Light & Power Company Is Greatly Expanded by Continental Gas & Electric Purchase

Reference has been made several times recently in the ELECTRIC RAILWAY JOURNAL to the purchase negotiations by which ownership of the Columbus Railway, Power & Light Company, Columbus, Ohio, would pass to the Continental Gas & Electric Corporation interests and so to the United Light & Power Company. Other phases of the negotiations for the expansion of the activities of the United Light & Power Company are of interest.

Some little time ago the United Light & Power Company announced through its president, Frank T. Hulswit, that the company had acquired more than 75 per cent of the outstanding common capital stock of the Continental Gas & Electric Corporation, which controls, through stock ownership, among other valuable properties, the Kansas City Power & Light Company and the Columbus Railway, Power & Light Company. In turn the United Light & Power Company offered to acquire all of the remaining outstanding common shares of the Continental Gas & Electric Corporation, in exchange for its class "B" preferred stock and class "A" common stock.

OPERATIONS ENLARGED

It was stressed in recent statements that the consolidation brings together a number of men who have been long associated with the successful management and operation of public utility enterprises in the Middle West, of whom several will be included on the board of directors of the enlarged company, including C. S. Eaton, Cleveland, Ohio; Joseph F. Porter, Kansas City, Mo., and Rufus E. Lee, Omaha, Neb.

The United Light & Power Company, succeeding a company of similar name organized in 1910, owns all or a very large amount of the common stocks of the following companies: Continental Gas & Electric Corporation, the Tri-City Railway & Light Company, the Chattanooga Gas Company, the Fort Dodge Gas & Electric Company, the Cedar Rapids Gas Company, the Peoples Gas & Electric Company, the Ottumwa Gas Company and the La Porte Gas & Electric Company.

The greatest interest to readers of the ELECTRIC RAILWAY JOURNAL attaches to the groups embraced in the properties of the Continental Gas & Electric Corporation and the so-called Tri-City group. The Continental group includes the railway properties at Columbus, Ohio, and in Lincoln, Neb. Both of these are very recent purchases. Only within the last few weeks has the Lincoln deal been approved by the State Railway Commission. It contemplates the merging of the Lincoln Gas & Electric Company and the Lincoln Traction Company. Holders of the preferred stock of the Lincoln Traction Company were offered 50 cents on the dollar in cash or 60 cents on the dollar in Continental Gas & Electric preferred for their holdings. The basis on which the common stock was acquired has not been made public. At

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one time this common commanded a price of $80 a share, but before the purchase by the Continental was made it was offered in small lots at $5 a share. For 5 years no dividends were paid on the preferred stock, but the accumulated dividends were liquidated some time ago by their payment in additional preferred. Dividends were then resumed, but the last payment was made in 1923.

The headquarters of the Tri-City Railway & Light Company are at Davenport, Iowa. This company through its subsidiaries operates all of the public utilities in Davenport, Muscatine and Iowa City, Iowa; Rich Island, Moline, East Moline and contiguous territory in Illinois.

Public Directors Named for New York Railways

The New York Transit Commission has nominated Samuel L. Martin and George B. Gibbons as public directors of the reorganized New York Railways, New York City. The naming of public directors on the reorganization of existing companies is in pursuance of the policy of the commission carried out in the cases of the Interborough Rapid Transit Company and the Brooklyn-Manhattan Transit Corporation.

Mr. Martin is a native of Virginia. After some business experiences, he was secretary to George McAneny when he was president of the Borough of Manhattan. Later Mr. Martin was executive secretary to Mayor Mitchel. During the war he was connected with the work of the War Trade Board in Washington and Japan. Since that time he has been in the insurance business. Lately he has been vice-president of the United States Merchants & Shippers Insurance Company.

Mr. Gibbons is the head of the municipal bond investment house of George B. Gibbons & Company, New York. He was born in Detroit, Mich., but has been a resident of New York for more than a quarter of a century. He was an officer in the New York National Guard for many years and a captain in the 104th Field Artillery of the 27th Division, in France, during the war.

Good Showing Made at Schenectady

A marked improvement in the financial operation of the Schenectady Railway, Schenectady, N. Y., for the quarter ended Dec. 31, 1924, over the corresponding period of 1923, is shown in the report filed with the public service commission. The net corporate income increased more than $200,000.

REPORT OF SCHENECTADY RAILWAY FOR DEC. 31 QUARTER

	1923	1924
Operating revenues	$383,862	$422,633
Operating expenses	527,216	321,738
Net revenue	*$144,354	$100,895
Taxes assignable to railroad operation	26,475	25,004
Operating income	*$170,829	$75,891
Non-operating income	605	495
Gross income	*$170,225	$76,386
Fixed charges	45,061	54,320
Net corporate income	*$215,285	$22,065

*Loss.

Traffic Continues to Decline

Expenses of Washington Company Decreased—Money Used Liberally for Reconstruction

For the year ended Dec. 31, 1924, the balance of income of the Washington Railway & Electric Company, Washington, D. C., credited to profit and loss was $256,749. To this was added miscellaneous items making the total credited to profit and loss during the year $258,036. In 1923 the total was $287,906.

These figures were all contained in President Ham's report presented to the stockholders at the annual meeting on Jan. 17, 1925. During the year the company carried 77,786,675 revenue passengers and 23,613,607 transfer passengers, a total of 101,400,282. This represented a decrease of 3,731,932 revenue passengers compared with the preceding year. Passenger travel has been falling off steadily from the peak, which was reached in the spring of 1920. In 1919 91,488,735 revenue passengers were carried, the greatest number in any single year in the history of the company. The result for 1924 represents a decrease of 13,702,060. This has been due principally to the reduction in governmental activity releasing many employees, the increased use of the private automobile and competitive bus lines.

CONDENSED STATEMENT OF WASHINGTON RAILWAY & ELECTRIC COMPANY, 1924

Gross earnings from operation	$4,759,243
Miscellaneous income (including dividends from Potomac Electric Power Company)	858,802
Gross income	$5,618,046
Operating expenses (including depreciation), taxes and miscellaneous charges	3,820,621
Interest on funded and unfunded debt	790,675
Payment of dividend on 5 per cent preferred stock	425,000
Payment of dividend on common stock (5 per cent)	325,000
	$5,361,297
Balance of income for year 1924, credited to profit and loss	256,748
Miscellaneous items credited to profit and loss	1,287
Total credited to profit and loss during the year	$258,036

While operating revenues of the company have fallen off $271,534 as compared with the preceding year, reductions in operating expenses totaled $241,028. Although every effort was made to operate the company economically, yet with the large decrease in revenue passengers and the present fare of 8 cents cash or six tokens for 40 cents, it was impossible for the railway to earn a reasonable return on the value of its property even as fixed by the Public Utilities Commission.

Although the earnings were insufficient, the policy of liberal expenditures for maintenance and reconstruction was continued. On this work, and on general repairs and on the allowances for depreciation, $966,458 was spent.

During the year recently ended 10 new cars of the pay-within type were placed in operation. Thirteen of the pay-as-you-enter type were converted into pay-within type cars and eight buses were added to the transportation equipment, making the total number of buses now in operation 23. While the operation of buses has not proved compensatory the company adheres to its policy to establish such bus lines as may be necessary. It has repeatedly expressed its willingness to start such lines for the public convenience, believing that the public is best served by the operation of buses in co-ordination with the railway.

The report referred to the splendid results of the safety campaign which was started several years ago. Although the streets seem very much congested due to the great increase in the number of automobiles, accidents have been greatly reduced and the claims situation materally improved.

The company sold on July 17 $2,496,000 of its general and refunding mortgage 6 per cent 10-year gold bonds dated Nov. 1, 1923. These bonds were sold to retire $1,000,000 of 6 per cent 5-year general mortgage bonds which matured Dec. 1, 1923, and to provide additions to plant and equipment up to June 30, 1923. The Washington Railway & Electric Company also obtained authority from the Public Utilities Commission under date of Dec. 11, 1924, to issue and sell $1,850,000 of its general and refunding mortgage 6 per cent 10-year gold bonds, dated Nov. 1, 1923, for the purpose of retiring a similar amount of Metropolitan Railroad first mortgage 5 per cent bonds which matured Feb. 1, 1925. These bonds have not yet been sold.

The total outstanding bonded debt of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, is now $31,350,750. This added to the $15,000,000 of capital stock of the parent company and $95,350 outstanding capital stock of subsidiary companies makes the total outstanding capitalization at this time $46,446,100.

The total payroll for 1924 of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company. was $4.281 217. an increase of $95,496 over that of the preceding year.

The accompanying table shows the condensed statement for the year 1924, subject to revision upon final audit.

Philadelphia's Mistaken Attitude

A recent issue of "Service Talks," published by the Philadelphia Rapid Transit Company, Philadelphia, Pa., reminds the public that under the 1907 agreement the city is to divide equally with the company any earnings above the amount necessary to pay 6 per cent dividends, cumulative, on the $30,000,000 of stock. The stockholders, however, thus far are $20.000,000 short of having received the dividends contemplated. "Service Talks" says:

> Almost every move the company has made to reduce costs or increase revenue has been mistakenly fought by the city. Since all excess earnings over 6 per cent, cumulative, must be divided fifty-fifty with the city, there would seem to be every reason why the city should, in self-interest, now co-operate with men and management in a supreme effort to make city built transit self-supporting.

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Massachusetts Property Nearing Desired Goal

The Worcester Consolidated Street Railway, Worcester, Mass., netted enough income in 1924 to pay a dividend of 5 per cent on its stock, according to President Clark V. Wood. This will result in putting the company into the class of public utilities the bonds of which may be held legally by Massachusetts savings banks. This statute provides that a street railway must pay dividends for five consecutive years before its bonds get into the savings bank class. The Consolidated, after a series of years with no dividends, has paid them now for 2 years. Operating receipts in 1924 were about $570,000 less than in 1923, but operating expenses in 1924 were reduced about $450,000 over 1923. In other words, the net revenue in 1924 was about $120,000 less than in 1923. Labor costs were advanced by wage increases granted by the arbitration board under the agreement which expires in the spring, but the working forces were reduced and one-man cars substituted for two-man cars wherever feasible.

Abandonment in Hudson Opposed.—Opposition of the city of Hudson, N. Y., to the proposed abandonment by the Eastern New York Utilities Corporation of its local tracks in Hudson east of Seventh Street was registered at a hearing on the company's petition before the Public Service Commission on Feb. 10. James A. Connell, assistant treasurer and auditor of the company, submitted compilations of figures showing the decrease in the number of passengers and revenue from the local line in recent years.

Revenue Statement Submitted.—The first report of earnings, as required by the Wisconsin Railroad Commission when it ordered an increased in rates on the lines of the Madison Railways, Madison, Wis., was submitted by that company recently. Total revenue passengers for January, 1925, aggregated 616,956, while the gross passenger revenue was $39,779, the report reveals. The report further shows that the average revenue passengers for January during the 4-year period 1921 to 1924 aggregated 679,608. The average passenger revenues during the same month in the same 4-year period totaled $39,647.

Municipal Line Shows Slight Profit.—Officials in charge of the Greenfield & Montague Street Railway, Greenfield, Mass., report the 5 months of operation in their charge, August to January, show receipts over expenditures to be $1,135. Of this money 85 per cent has been returned to the towns in the so-called transportation area, giving $668 to Greenfield and $295 to Montague. The surplus of $170 is kept in the treasury. The total income for the 5 months was $31,496 and the expenses $29,371. A reserve of $500 is carried for contingencies, $1,300 for depreciation and $800 for operation. Operation under this general scheme was described at length in the ELECTRIC RAILWAY JOURNAL for Jan. 10, page 59, in which same issue the matter was discussed editorially.

Authorizes Discontinuance of Division.—The Public Service Commission recently granted the petition of the Olean, Bradford & Salamanca Railway, Olean, N. Y., for permission to discontinue the operation of its Little Valley division, remove its tracks and dispose of its right-of-way. The evidence showed that the line was operated at a loss of $6,933 during the year 1923, taking no account of depreciation, and that the revenues had been steadily declining for the past 6 years. The railway is preparing to acquire and operate a bus between Olean and Little Valley. The commission's order requires that the railroad restore the pavement in Rock City Street, Little Valley, and the state highway to as good condition as the adjoining portions.

Order of Foreclosure Entered.—An order of foreclosure against the Joplin & Pittsburg Railway, Pittsburg, Kan., was issued by the United States District Court at Kansas City, Mo., Jan. 31. The order was requested by the holders of the first mortgage bonds.

Mr. Insull Resigns a Directorship.—Samuel Insull has withdrawn from the board of the Chicago City & Connecting Railways Collateral Trust, Chicago, Ill. No reason was announced, but Mr. Insull is said to have written to B. E. Sunny, chairman of the board, indicating a lack of sympathy with the policies of Leonard A. Busby, president of the City Railway properties, in connection with the negotiations to sell the Surface Lines to the city. The board at its annual meeting did not attempt to fill Mr. Insull's place.

Temporary Receivers Appointed.—Hamilton Disston, Jr., and Henry J. Rebman were recently appointed temporary receivers for the Frankford, Tacony & Holmesburg Street Railway, Philadelphia, Pa., by Judge Horace Stern of the Common Pleas Court. The action was taken on motion of Roberts & Montgomery, solicitors for the Tacony Trust Company, trustee. The decree is effective until March 2, at which time there will be a hearing on the question of appointing receivers permanently.

Toronto Railway Liquidating.—The Canadian *Financial Post* says that in order to push ahead the winding up of the Toronto Railway, Toronto, Ont., the liquidator is calling for tenders for the purchase of the remaining properties now in the hands of the company. These have been referred to as the wreckage or débris of the old concern, but there are some really valuable properties, and several of them are expected to add materially to the treasury of the company. The amount shareholders are likely to get over and above the $110 already distributed will depend in a good measure on the successful sale of the properties still held. It will be recalled that the Toronto Railway is in process of liquidation following purchase of the property some time ago by the city.

Will Issue $2,116,000 in Bonds.—Stockholders of the Worcester Consolidated Street Railway, Worcester, Mass., have voted to issue, subject to the approval of the Public Utilities Commission of Massachusetts, $2,116,000 of first and refunding mortgage bonds due Aug. 1, 1930, which have been held in the treasury of the company unused. The new bonds will bear 6½ per cent coupons. Application has been made to the public utilities department for authority to sell the bonds. The details involving the proposed issue were given in a recent issue of the ELECTRIC RAILWAY JOURNAL.

Back Dividends All Paid.—The Louisville Railway, Louisville, Ky., has declared a dividend of 5 per cent on the preferred stock, payable on Feb. 15. The payment of this dividend will clear up all accumulations on the issue.

Another Power Property Purchased.—The Illinois Power & Light Corporation has purchased through the Omaha & Lincoln Railway & Light Company, a subsidiary, all the physical properties and good will of the Ashland Light, Power & Mill Company, Ashland, Neb. The property comprises a hydro-electric plant, a dam and water power rights, a central steam plant and a widespread network of transmission lines. The price paid for the property was not made public. Approximately $50,000 will be spent immediately on additional transmission lines and revision of the physical property.

December Shows Gain.—In revenue receipts and number of passengers, the Seattle Municipal Railway showed for December, 1924, a gain over a similar period of the previous year. In spite of the heavy expenses due to the snowstorm of the month, the carlines showed a net profit of $9,686. The revenues in December, 1924, totaled $552,505 compared with $524,575 in December, 1923. The number of passengers was 6,693,601 compared with 6,476,848.

Eastern Massachusetts Doing Well.—The Eastern Massachusetts Street Railway, Boston, Mass., reports to the Department of Public Utilities for the quarter ended Dec. 31, 1924, net income after dividends and all charges of $223,025, against $3,637 in same period of 1923. Net for the year was $77,797, against a loss of $81,318 in 1924.

Want to Sell Property.—Hugh Goodfellow, Warren Olney and W. I. Brobeck, as trustees of the San Francisco-Oakland Terminal Railways and Key System Transit Company, jointly have applied to the California Railroad Commission for permission to sell to the Southern Pacific Company the property formerly belonging to the San Francisco-Oakland Terminal Railways for the sum of $120,000. This property is the portion of the California Railways lying south of East 14th Street in the city of Oakland, consisting of seven parcels and including all railroad tracks and appurtenances, rights-of-ways and franchises. The Key System Transit Company shall retain possession of trolley equipment and shall have the privilege of operating over the same.

Made Receiver of Long Island Electric.—Gen. Lincoln C. Andrews was appointed receiver of the Long Island Electric Railway, New York, N. Y., by Justice Faber in the Queens Supreme Court on Feb. 6. The application was made by the Long Island Railroad Company.

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Personal Items

C. L. Kurtz, Resigned

Following Change in Control, Head of Utility at Columbus, Ohio, Retires —Property Rehabilitated Under His Régime

When Charles L. Kurtz stepped down as president of the Columbus Railway, Power & Light Company, Columbus, Ohio, at the directors' meeting on Jan. 27 he ended a period in his career which will go down in railway history as one of the outstanding examples of generalship in the field of public utilities.

In January, 1919, when Mr. Kurtz assumed that office, the company was without credit, its bond interest was in default, dividends on stock had been suspended, back wages, ordered to be paid the employees during the war, presented another obstacle, and a suit had been instituted by Augusta Slaymaker, a stockholder, for receivership, an accounting and a judgment against the company. In addition pink slips had been issued by the company to passengers who paid a 5-cent cash fare, redeemable for 1⅞ cents each if the company won the Slaymaker case, which it did.

During the period that the company was under the direction of Mr. Kurtz more than $13,000,000 was spent for construction and rehabilitation. The daily average of cars in service at the beginning of the 1919-1925 period was 115 to 120. Now it is 320. One and a quarter million dollars was spent in building underground conduits through the center of the city. Within a month a new concrete and steel garage, covering nearly a city block, will be completed to house between 80 and 90 automobiles and trucks. During the latter part of his incumbency Mr. Kurtz and his board of directors closed a deal for a new office building, the first home ever owned by any railway in Columbus since the industry started in 1854. This structure, practically new, 185 ft. deep and 95 ft. wide, is located in the business section of Columbus. Moreover, a new power plant is under construction that will have an ultimate capacity of 150,000 kw.

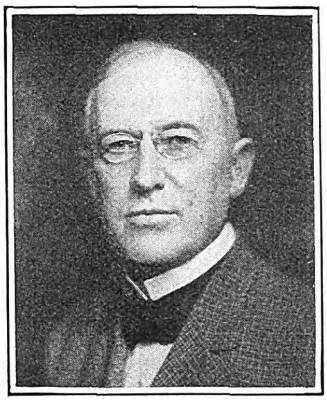
These are some of the outstanding achievements of the company during the presidency of Mr. Kurtz. All of them were accomplished through his influence, skillfulness, level-headedness, perseverance, and last, but not least, hard work.

The first thing Mr. Kurtz did when he assumed charge in Columbus in 1919 was to institute a program of the most rigid economy. Waste was eliminated. At the same time he worked to build up the morale and restore co-operation as the touchstone of success.

Two years later, through the efforts of Mr. Kurtz, the company received permission from the Ohio Utilities Commission to issue additional A and B preferred stock, enough to equal the amount of dividends accrued on the original amount of A and B stock, thus wiping out dividends then in arrears by giving stockholders stock equal to the amount of dividend due them. Since then all dividends have been paid regularly.

About this time Mr. Kurtz won his fight before the City Council for an increase in fare. For many years Columbus citizens had been buying eight tickets for 25 cents. The new rate called for five tickets for 25 cents, a 6-cent cash fare, with a universal transfer free of charge. Furthermore, Mr. Kurtz succeeded in placing a $3,000,000 loan to pay floating debts. This loan has since been wiped out entirely.

It has often been said the quotations for a company's securities are about the best criterion of the general regard in which it is held. A few quotations will show what was done during the 6 years Mr. Kurtz was in office. In 1919 the common stock was quoted at $8 a share. Today it is $115 a share. In 1919 A preferred was 42, now about 95. Series B was 23, now 87. In 1919 4 per cent bonds sold from 40 to 42. At the beginning of 1925 they were quoted at 80. Five per cent bonds jumped from 55 in 1919 to 96 in 1925.



C. L. Kurtz

The man who did all these things—or was directly or indirectly responsible for their accomplishment—brought to his task with the Columbus company a wealth of business experience. He quit school in the grammar grades, but the grasp that he showed of the problems before him secured for him at the age of 13 a loan of $5,500 without collateral security. Since then he has been afoot on life's highway. His experiences have indicated to him that there is nothing quite so pleasing as to live under one's own hat. For some years he represented his home of Athens in the General Assembly of Ohio, and was the youngest member, at the age of 25, the age limit for such public office. Then he felt the call of public life and spent about 25 years as chairman of the Republican state executive committee, member of the National committee, state inspector of oils and private secretary to Governor Foraker, to mention only a few of his activities.

Twenty-seven years ago Mr. Kurtz forsook politics for business. During this period he has been engaged as chief executive of various corporations —the Columbus Public Service Company, a coal company, an asphalt paving company, a paving block company which controlled the output of 15 producing companies, and has latterly been president of the Scioto Stone Company, the Keever Starch Manufacturing Company, the Guanajuato Reduction & Mines Company (a large operation in Mexico which has been producing gold and silver for 20 years).

Mr. Kurtz is at present devoting his time to other projects in which he is interested. He is 70 years old, still very active and energetic and attributes his good health to hard and constant work.

Changes Made in International Personnel at Buffalo

B. J. Yungbluth has been appointed vice-president in charge of operation of the International Railway, Buffalo, succeeding R. Harland Horton, who has gone to Philadelphia. Mr. Yungbluth goes to Buffalo from Philadelphia, where he had been associated with the Philadelphia Rapid Transit Company since 1920. His first connection with the Philadelphia traction system was as a member of the coordinating committee. A year later he was made supervisor of purchasing and supplies. He held this position for 2 years and was promoted to assistant vice-president in charge of finance and accounts. His last position in Philadelphia was assistant vice-president of traffic.

Mr. Yungbluth started his railway career with the Duluth South Shore Railroad, where he rose to the position of storekeeper of the Hancock, Mich., stores. He was connected with that company for 7 years. Later he became storekeeper for the New York Central Lines at Lima, Ohio, and remained there 4 years. In 1909 he became associated with the Pittsburgh Railways as general storekeeper and remained on that property until 1920, when he resigned to accept the position with Mitten Management.

Leslie Spraggon has been appointed superintendent of equipment of the International Railway, to succeed George Kuhn, who has been made superintendent of shops of the company. Mr. Spraggon was at one time inspector of rolling stock with the Connecticut Company. He resigned that position in 1920 to go to the Boston office of the Westinghouse Electric & Manufacturing Company.

G. W. Barker, for more than 25 years associated with the traffic and transportation departments of the International Railway, has been appointed operating manager of the International Bus Corporation, a subsidiary operating the bus lines in Delaware Avenue, Delevan Avenue and Bailey Avenue. Mr. Barker has served as superintendent of the Main Street and Hertel Avenue stations of the International Railway.

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Robert Colwell, heretofore superintendent of the Edmonton Radial Railway, Edmonton, Alta., has been appointed manager of the Railway Utility, Winnipeg Electric Company, Suburban Transit Company and Winnipeg, Selkirk & Lake Winnipeg Railway, at Winnipeg, Man. This is a new position created as a result of a reorganization of the operating staffs. Mr. Colwell was born in Simcoe County, Ont., Nov. 5, 1876. He entered transportation service on Jan. 1, 1900, with the Winnipeg Electric Railway,

H. Cowan, heretofore night foreman of the shops of the Niagara, St. Catharines & Toronto Railway at St. Catharines, Ont., has been appointed general foreman of the Canadian National Electric Railways, Toronto Suburban District, shops at Lambton and Weston. He will make his headquarters at the Lambton shops.

Obituary

Robert N. Wallis

Robert N. Wallis, treasurer of the Fitchburg & Leominster Street Railway for a number of years, and prominent in banking, welfare, social and business organizations, died recently at his home in Fitchburg, Mass. Following his graduation from the Massachusetts Institute of Technology, and after a brief period spent in financial journalism in Boston and a year with a business house in Philadelphia, Mr. Wallis returned to Fitchburg to succeed his father as treasurer of the Fitchburg & Leominster Street Railway.

This office was considered a difficult seat in the councils of most any transportation company in those years, but Mr. Wallis's financial ability was soon recognized and his interest extended into the general field of operations. It was said of him that his devotion to the company was no greater during its days of prosperity than it was in its leaner years, and that this devotion was not restricted in the least by his desire that the public should always have the best service which the company could give. He had been trustee of the Worcester North Savings Institution since 1914 and clerk of the corporation since 1899, as well as a director in other trust companies.

Mr. Wallis was president of the American Street and Interurban Railway Accountants' Association in 1908. His activities in behalf of the association were conspicuous.

Although he was overwhelmed with the busy affairs of the railway company, he gave his untiring efforts to the building up of the relief association of the railway. He was its treasurer for many years.

Daniel W. McFetridge, formerly purchasing agent for the Lehigh Valley Transit Company, Allentown, Pa., died at his home in that city on Jan. 31. For the last few years he had been purchasing agent for the Lehigh Portland Cement Company.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Official Tells of Twin City Activity in Car Building

Details of the arrangement under which the Twin City Rapid Transit Company is building cars for other cities were recently made public in a statement issued by Horace Lowry, president of the company.

Mr. Lowry explained that the Twin City lines have very large modern shop facilities which have not been fully utilized in recent years on account of conditions brought about by the war. When the Light-Weight Noiseless Street Car Company received an order to build 50 cars for the Chicago Surface Lines an arrangement was made with the Transit Supply Company, a subsidiary of the Twin City Rapid Transit Company, to have this work done in the Twin City shops, on a cost plus basis.

It was pointed out by Mr. Lowry that the stockholders of the Twin City Rapid Transit Company are protected against loss from this car-building activity and at the same time the Twin City shops are being kept busy. He said that the Transit Supply Company is protected in its arrangement with the Light-Weight Noiseless Street Car Company. Whether or not the car company makes a profit is of no interest to the Transit Supply Company, as the latter is protected and assured a profit by the nature of its contract.

This arrangement was considered highly desirable and profitable by Mr. Lowry. He claimed that the shops and personnel of the Transit Supply Company are inferior to none, and said that the company plans to continue building cars under this arrangement as long as this can be done without interfering with regular street car service in the twin cities. Any profits made from this construction work will go to the operating companies and will thereby be used to reduce the cost of car service.

Resolution Adopted to Investigate General Electric

The United States Senate by vote of fifty-five to twenty-five on February 9 adopted the Norris resolution providing for an investigation of the General Electric Company by the Federal Trade Commission. The majority included virtually all the Democratic Senators and the radical Republicans.

Senator Watson of Indiana, representing, it is believed, the administration viewpoint, attempted to amend the Norris proposal by precluding the investigation of stockholders or other security holders of the company.

That there has been large-scale propaganda in an effort to discredit municipal ownership of public utilities is contended by Senator Norris. It is believed that many of those who voted for the Norris resolution think it is unnecessary and is an effort to boost public ownership, but at the same time they had no information as to the conduct of the company and did not feel justified in voting against the proposal.

It is expected by certain well-informed observers in Washington, however, that the investigation will prove to be a great disappointment to those who conceived it.

Interborough Rail Order to Bethlehem, Not Krupp

Much attention was attracted by the statement made recently that the Interborough Rapid Transit Company, New York, was negotiating with Krupps in Germany for 6,000 tons of rails. The company did so negotiate, but the order has been placed at home with the Bethlehem Company for the full amount of the tonnage in rails weighing 100 lb. to the yard.

Interest lies in the fact that the order remained at home. It can be said that while American steel rail business has fallen off in neutral markets, and we may expect to see a good deal of generalizing from a few facts as to the trend of things in the international steel trade, thus far it does not appear that foreign steel will figure in any large way in this market. We consumed about 26,000,000 tons of domestic finished steel products last year, and it would take nearly 100,000 tons on top of the total imports of 1924 to bring our consumption of foreign steel up to 1 per cent of the domestic output.

The *Iron Age* said recently that low prices have always been a factor in the shifting of iron and steel trade across national borders, but such low prices have been sporadic and occasional. Proximity, service, quality, mutual interest, and a half dozen other important considerations make it certain that American railroads are likely to rely upon the American manufacturers to meet their demands.

Metal, Coal and Material Prices

Metals—New York	Feb. 10, 1925
Copper, electrolytic, cents per lb	14.85
Copper wire base, cents per lb	17.00
Lead, cents per lb	9.70
Zinc, cents per lb	7.77
Tin, Straits, cents per lb	57.625
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.45
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.625
Central, Ill., screenings, Chicago, net tons	1.575
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1297
Turpentine (bbl. lots), N.Y., per gal	0.945

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Rolling Stock

The British Columbia Electric Railway, Vancouver, B. C., has ordered from the Canadian Car & Foundry Company, Montreal, twelve single-end cars arranged to be operated in trains during peak-load periods on Vancouver city lines. Their general type will be very similar to the trains which have proved successful in Montreal, but the cars will be somewhat larger, and the trailer will have complete four-motor equipment. The car bodies will be of all-steel construction, with girder side frames, similar to the Toronto Transportation Commission's cars. The electrical equipment will be unique, and will, it is said, be the first of its kind to be used in Canada for street car propulsion. The motors will have a rating of 55 hp. at 500 volts, to give ample margin for operation at the high schedule speeds required in Vancouver, over heavy grades. The control system will be multiple-unit, with automatic electrically operated camshaft controller operated by master controller on platform. The camshaft will be motor-driven, giving positive sequence of control steps, with current-limiting relay to give automatic acceleration. The master controller will have only three steps, starting, series and parallel, and in case the current-limiting relay operates too soon to start the car on a grade, the controller may be advanced by an advance lever till the car is in motion, when the automatic feature will come into play again. This control is similar to that installed in the Montreal Harbor Commission's new electric locomotives. The pneumatic door control will be interlocked with the master controller, so as to prevent application of power if all doors are not closed. The cars will be finished outside in enamel, red with cream trim, and the interior trim will be mahogany finished birch. The trailer differs from the motor car in that the length of the front platform is 7 ft. and the seating capacity is 55. The trail car has no rear platform. The detailed specifications of the motor car follow:

Seating capacity	50
Bolster centers, length	25 ft. 0 in.
Length over all	48 ft. 8 in.
Truck wheelbase	5 ft. 10 in.
Width over all	8 ft. 4 in.
Height, rail to trolley base	11 ft. 4½ in.
Headlining	Panelyte
Air brakes	Westinghouse SME-D, 10 x 12 in.
Axles	A.E.R.A. standard, 4½ in.
Bumpers	Rico anti-climbers, 7-in.
Car signal system	Faraday
Side bearings	Canadian Car & Foundry Company self-oiling roller
Control	Multiple-unit
Couplers	Tomlinson, Form 10 electric, with drum cutout switch
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fenders	HB lifeguards
Headlights	Golden Glow
Journal boxes	3½ x 7 in.
Motors	English Electric Company, outside hung, 55 hp.
Seats	Rattan upholstered
Trolley retrievers	Earll, 4-A, long drum
Trolley base	U. S. No. 11
Trucks	Canadian Car & Foundry Company
Wheels	30 in., rolled steel

Interstate Consolidated Street Railway, Attleboro, Mass., which has just passed to the control of Hemphill & Wells, New York, will be equipped by the new owners with five double-truck one-man cars and three single-truck one-man cars. Orders for these cars have been placed with the Wason Manufacturing Company at Springfield, Mass. The Interstate was formerly operated with cars that were leased.

Newport Electric Corporation, Newport, R. I., ordered during January of the Fageol Motors Company, Oakland, Cal., four buses of the street-car type.

Seattle Municipal Railway, Seattle, Wash., may possibly be in the market for new buses for equipping feeder lines, if the suggestions recently laid before the City Council are approved.

Macon Railway & Light Company, Macon, Ga., has reconstructed 13 of its cars into one-man cars. The remaining 28 will be converted into the one-man variety as rapidly as possible.

Pacific Northwest Traction Company, Everett, Wash., ordered during January of the Fageol Motors Company, Oakland, Cal., two six-cylinder chassis.

Track and Line

San Francisco, Cal.—The Board of Supervisors approved the measure for the improvement of Judah Street from 31st to 41st Street. Instructions were immediately issued to begin construction of the improvement. When completed, the project will allow the passage of a municipal car line from the ocean to the proposed Mission tunnel when the route for that has been finally decided upon. An appropriation of $500,000 for the street car line is already available, but has been awaiting the Judah Street improvement.

San Diego Electric Railway, San Diego, Cal., completed recently the Tide Street three-tier grade separation crossing, or Santa Fé overhead crossing, at a cost of $290,000. It has taken almost 5 months to construct the new viaduct, which is 2,000 feet in length. The object of the improvement was to eliminate the combination hazard that formerly existed at this spot.

Los Angeles Railway, Los Angeles, Cal., is laying new tracks on Fifth Street between Flower and Grand, for which a franchise was recently awarded by the city. Girder rail of 116-lb. weight is being used.

Seattle Municipal Railway, Seattle, Wash., may extend its Montlake and Eastlake Street car systems to the University of Washington, if the agitation started by the people of the district affected results in action. D. W. Henderson, superintendent, was asked to report on the proposition.

Shops and Buildings

Detroit United Railway, Detroit, Mich., suffered damages of $10,000 recently by a fire at its Ann Arbor carhouse. The office was partially destroyed, but the records were saved.

Long Island Railroad, New York City, N. Y., has the structural steel in place for the new addition to its Morris Park shops. When completed this will provide six overhauling tracks for electric car equipments and complete overhead traveling cranes and material-handling facilities.

Trade Notes

Joseph Dixon Crucible Company, Jersey City, N. J., which manufactures graphite products, pencils, lubricants, crucibles and paint, announces the removal of its Boston office from 49 Federal Street to 80 Federal Street, the new Chamber of Commerce Building.

Differential Steel Car Company, Findlay, Ohio, is acting jointly with the International Steel Tie Company, Cleveland, and is sending H. F. Hastings as a representative through Central and South America and several European countries, particularly Spain, Holland, Belgium and England and later Australia, to visit both the electric traction interests and the steam railroads in these countries. Mr. Hastings, A.M.I.C.E., was formerly representative of a big British manufacturing interest in Spain. He has already covered Cuba, several of the Central American countries and South America and is now en route for Spain.

Illinois Central Railroad has placed an order with the Ohio Brass Company for Tomlinson automatic air and electric couplers to equip 260 cars.

Scott Valve Manufacturing Company, Detroit, Mich., has appointed Russell F. Kleinman, Land Title Building, Philadelphia, as its sales representative. Mr. Kleinman will handle the complete line of Scott bronze and iron body valves in eastern Pennsylvania, southern New Jersey, Maryland, Delaware and the District of Columbia. The Charles H. Tinker Company, 201 Devonshire Street, Boston, Mass., has been appointed the New England representative for the Scott complete line of bronze and iron body valves.

International Oxygen Company, Newark, N. J., re-elected its officers at the annual meeting of the stockholders on Jan. 20. John Heller was added as secretary. The newly elected board declared a dividend of 6 per cent on all the outstanding stock of the company, payable semi-annually.

Blodgett Engineering & Tool Company, Detroit, Mich., has added Roy Gill to its sales organization. Mr. Gill is well known throughout the machine tool field in the United States and will work directly out of the Blodgett factory as a special sales and service representative.

New Advertising Literature

Herman H. Sticht & Company, New York, N. Y., has issued bulletin No. 135, an 8-page pamphlet describing the several models of its Standco "2 in 1" megohmers. The pamphlet has several illustrations and diagrams.

Georgia Railway & Power Company, Atlanta, Ga., has issued a supplement to its "Snap Shots," dealing with its record of the Ohmer system of fare accounting for December, 1924.

Wagner Electric Corporation, St. Louis, Mo., has issued bulletin No. 141, on Wagner repulsion-induction motors, BA type and bulletin 142 on the Wagner split-phase induction motors, BB type.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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MORRIS BUCK, *Managing Editor*

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Railway Association Raised to New Plane of Usefulness

NO MORE important step has been taken by the American Electric Railway Association than that brought to fruition and announced at the Midyear Meeting in Washington, and for which the industry is primarily indebted to President Shannahan.

First, an advisory council has been formed which brings to the electric railways and to the association the active interest, support and direction of such outstanding men as these:

B. C. Cobb, Owen D. Young, Guy E. Tripp, Samuel Insull, Randal Morgan, Lucius S. Storrs, Henry G. Bradlee, Nicholas F. Brady, Britton I. Budd, Frank R. Coates, Samuel M. Curwen, Frank L. Dame, Henry L. Doherty, Charles D. Emmons. Philip H. Gadsden, Thomas N. McCarter, Sidney Z. Mitchell, John H. Pardee, H. Hobart Porter, Paul Shoup, R. P. Stevens, Arthur W. Thompson and John N. Shannahan, president of the American Electric Railway Association, ex officio.

Second, the association activities are broadened by appointment of a managing director in the person of Lucius S. Storrs, president of the Connecticut Company, a past-president of the association and one of the foremost men of the industry.

The association in years past has done splendid work and has been a very constructive and helpful agency. But it has been apparent to many that its maximum possibilities were not being realized, and could not be, under the leadership of a president elected annually. The president has always been a railway executive whose primary duties lay with his property, the association necessarily being to him a secondary responsibility. However capable and far-seeing he was, he could not give the time to do the many bigger things for which there have been and will continue to be repeated opportunities. In other words, the industry has had no one who could represent it adequately before various public bodies, or who could take part in those local situations which, in their reaction and reflection throughout the entire industry, have so vital and important a national aspect.

Under the plan now adopted the industry will have one of its most successful executives, backed by the advisory council, as its permanent representative, and making it his sole duty to look after the interests of the electric railway business. This will naturally tend somewhat to relieve the president of duties which have come to demand more time and energy than could be devoted to them by an active railway executive. It should be remembered that the president of the association is selected from the country at large and not because his own headquarters are near those of the association. The association has been extremely fortunate in having presidents who have spent considerable time at headquarters, often at great personal sacrifice, but this condition cannot always prevail.

This, indeed, is the most important step the association has yet taken and no words of praise will be too glowing for the accomplishment of Mr. Shannahan.

Expense of New Association Plan of Small Importance

THERE are those who will see first the expense of this new plan of the association rather than the possible results. It will add expense, to be sure—but when this is spread over the industry, the amount needed from each company will be so small as to be negligible.

At the present time, it was felt that this expense could not be borne by the association out of its revenue from dues, inasmuch as the cost of the work heretofore done by the Committee of One Hundred has but recently been taken over by the association. This will consume most of the surplus the association has heretofore enjoyed. Rather than raise the dues, the advisory council members agreed to underwrite the cost of the expanded activities of the association which this move contemplates. Nevertheless, it is anticipated that the value of the work to be done will be so far-reaching that it will be enjoyed by the small companies as well as the large. Accordingly, the support of all companies, both railways and manufacturers, should be accorded if the plan is to come to full fruition, and they should be glad to relieve the underwriters of the burden they have assumed.

The JOURNAL is heartily in accord with the whole plan. It should be given full support and co-operation by the railways and the manufacturers of the industry generally.

Selecting the Right Man for Managing Director

AFTER the advisory council had agreed on the new plan of organization, attention turned to the work of obtaining for the position of managing director a man of outstanding ability. A new position of this character can only be as great as the man selected to fill it, for what it becomes depends almost entirely on what he makes of the opportunity. It was, therefore, no small task to select a man who would combine those attributes essential to obtain results—a man of vision, breadth of purpose, and depth of character, and one who had the confidence of the industry, of the financier and of the public.

To make the selection a yardstick was set up, and each man thought suitable was compared with it. Before the council was able to find a man who possessed the particular experience and ability considered essential, the thought came to those making the selection that there could be but one answer—why go afield if the one man, the yardstick, could be persuaded to take the position? So Mr. Storrs was approached, even

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though it was felt that he would not consider severing his connections with the Connecticut Company, which he had served so ably. It was only because of the opportunity for greater service to the industry that he was willing to accept the newly created position.

In Mr. Storrs are combined those qualities that are needed for leadership. He has successfully piloted one of the largest railways in this country through the most difficult period in the history of the industry. In turn, he has displayed the patience and tact necessary to solve harassing problems by negotiations and the indomitable fighting spirit needed to insure victory when the situation has passed beyond the point of mediation. No better indication of his executive ability can be found than the high esteem in which he is held by his fellow workers in the industry and by the general public in the territory where his company is located.

Partial Relief of Traffic Congestion Can Be Had at Once

ABOLITION of left-hand turns wherever possible was favored by the committee on relief of traffic congestion of the Transportation & Traffic Association at the Midyear Meeting in Washington. In the past it has been claimed by those wishing to permit left-hand turns that congestion is increased by forcing vehicles to go around three sides of a square to accomplish a change of direction. After careful consideration of the problem and investigation of conditions in a number of cities, however, the committee is strongly of the opinion that the elimination of left-hand turns at street intersections and in the middle of the block will relieve traffic congestion. This is a measure which can be put in effect now where congestion is serious.

A criticism which can justly be made of most schemes to relieve traffic congestion is that they are too ambitious for practical purposes. More and wider streets are frequently urged as a remedy. Whether this would really improve matters or only encourage more vehicles to use the streets is problematical. Aside from that, the great defect of such a plan is that it would take years to carry it out. Immediate relief is needed. Rather than devoting their attention to plans to relieve congestion 5 years, 10 years or 50 years in the future, municipal authorities should consider what can be done now. After partial relief has been secured the future needs can be studied.

In addition to the elimination of left-hand turns several other partial remedies could be put into effect at once at small cost. By limiting parking to the left-hand side of narrow, one-way streets and forbidding vehicles to park two abreast on any street a considerable gain in useful street capacity would be had. Loading and unloading of delivery trucks could be regulated to leave the street free for moving vehicles. Some inconvenience would undoubtedly result from the enforcement of such rules. On the whole, however, it would probably be less than the inconvenience incident to the ever-recurring delays under the "do as you please" plan so generally in effect now. Certainly no intolerable hardship would be inflicted on any one.

Regulations of this kind are not a complete and permanent solution of the problem. Elimination of all parking in the congested area would be far preferable to partial elimination. Such simple remedies as that recommended by the committee on relief of traffic congestion, however, can be put into effect without arousing antagonism. After this has been accomplished it may be possible to follow up with other more far-reaching measures. It is better to take a step in the right direction now than to hesitate simply because the ultimate goal seems a long way off.

Census Report, Just Out, Contains Much Interesting Information

ALTHOUGH very late in appearance, the census report of electric railways for 1922, just published, will prove of great value to electric railway companies. One reason for this is that no other agency than the Census Bureau compiles such extensive data in regard to the industry. Another reason is that the census figures for 1922 are directly comparable with those for the preceding electric railway census years of 1917, 1912, 1907, 1902 and 1890. A digest of the report, including reproductions of eleven tables of special interest in the 1922 census, is contained in this issue.

In general, the figures confirm those on the status of the industry, as shown in earlier unofficial figures compiled by independent observers, including this paper. There has been no increase in electric railway trackage in the 5-year period. In fact, there has been a slight decrease, since most of the recent extensions by railway companies have been made by buses. There is also a reduction in the number of passenger cars. This may be explained by the destruction by many companies of a considerable number of obsolete cars within the last few years. A lower value of road and equipment is shown in the balance sheet for 1922 as compared with 1917. This is perhaps explainable through the reorganization of several large companies and the fact that better times have enabled the companies to put their balance sheets in better condition. Clearer evidences of a more prosperous condition are an increase in number of revenue passengers of 12.2 per cent, of railway operating revenue of 42.3 per cent, of net revenue from railway operation of 7.9 per cent, of net corporate operating revenue of 12.3 per cent, of operating income of 6 per cent and, finally, of net income of 1.3 per cent.

A study of the operating expenses in 1917 and 1922 shows that the expenses in all of the primary accounts have increased greatly, the range being from 18.7 per cent for the small item of "traffic" to 83.9 per cent for "maintenance of way and structures." The average increase in expenses during the 5-year period was 60.8 per cent. The primary expense account showing the largest increase in dollars was, of course, "conducting transportation," owing to increases in wages paid. But it is an evidence of the economical measures introduced by railway companies to note that during each half decade since 1902 there has been a constant increase in number of revenue passengers carried per car operator (car operator in this case being understood as including conductors, motorman and one-man car operators, but not elevated railway and subway guards). In the last half decade this number increased from 83,010 passengers in 1917 to 97,267 passengers in 1922. Expenses beyond the power of the railway to control have also gained in magnitude, the taxes having gone up 35.6 per cent during the last 5 years considered in the report.

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Managing Director Appointed for American Association

Advisory Council Recently Formed by Executive Committee Creates New Office — Lucius S. Storrs, Selected to Fill This Important New Position, Is Widely Known in the Industry—Appointment Effective April 2

FOR some time past it has been felt that the American Electric Railway Association has not been tied in closely enough with the owners of the electric railway properties. It has been the operating men, the managers, engineers, superintendents, accountants and claim agents who have carried on the greater part of the association activities, both at conventions, in committee work, and even in the councils of the association. There have been questions of policy under discussion that are vital and of far-reaching importance. At times these have been of such a character that they could not be handled adequately by operating men. Yet the organization has not provided the opportunity for financial men and owners to take their place in the councils of the association.

This situation has been fully realized by President Shannahan and the executive committee. Complete recovery and modernization have been considered essential if the industry is to take the place it should hold among the industries of the country. This, it was felt, depended on the wholehearted backing of the owners. Accordingly, the executive committee of the association, at a meeting held on Nov. 20, 1924, passed a resolution authorizing and directing the organization of a new committee to be composed primarily of owners of the electric railway properties. This new body, termed the Advisory Council of the American Electric Railway Association, was at once appointed by President Shannahan. It consists of 23 members with B. C. Cobb, a man prominent in utility financing, as chairman. The full personnel of the committee is given on page 287 of this issue.

The council held its first meeting in New York on the evening of Feb. 3, with a large attendance. It was apparent at once that there was an opportunity to do a fine piece of constructive work. But in discussing

PRESIDENT J. N. SHANNAHAN

ways and means of procedure it soon became evident that there must be some one who could be charged with the duty of working out whatever policies were decided on. Such a man would of necessity have to speak, not alone for the advisory council nor for the association, but he actually would have to represent the industry itself.

A position such as this demands a man of the highest type—one with courage, vision, tact and industry. Representing both the owners and the operators, intimate knowledge of

LUCIUS S. STORRS

details of management, of financing, of public relations, are all essential.

The man selected for the place, Lucius S. Storrs, president of the Connecticut Company, is felt by all to be the man for the place. His choice will make available to electric railway managements and the public the services and advice of a transportation executive with wide experience. The company with which he is associated is one of the largest electric railway properties in the world. Its electric cars and buses operate practically in all parts of the State of Connecticut. That the people of that State have faith in Mr. Storrs is evidenced by their attitude. In return for square dealing, clean cars and good service, they have given his company better fares, protection against jitney competition and relief from paving charges.

During the last 6 years Mr. Storrs has devoted much time and energy to furthering the recommendations of the Federal Electric Railways Commission, which, under appointment of President Wilson, investigated all angles of the traction situation. Outstanding among its recommendations were frank dealing with the public, improved service and fair returns to the companies.

According to a statement made by leaders of the industry, the foremost problems now confronting it are modernization of equipment, new financing, and co-ordination of bus and electric railway service. It is maintained that best service and most reasonable fares will be provided to communities through the consolidation of all local transportation under suitable public regulation.

Mr. Storrs will retire from his position as president of the Connecticut Company, but will remain as a director. He will assume his duties on April 2, with offices in the Johns-Manville Building, Madison Avenue and 41st Street, New York City, on the floor adjacent to the new offices of the American Electric Railway Association.

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Transportation Topics Considered at Midyear Meeting

Fares, Merchandising Methods, Improving the Quality of Service and the Place of the Bus Were Among the Subjects Discussed by Prominent Speakers at Washington—Attendance Was Unusually Large

ONE OF the liveliest Midyear Meetings ever held by the American Electric Railway Association took place at Washington, D. C., on Feb. 16 and 17. Transportation topics were discussed by men representing the operating companies, the manufacturers, the public and the regulatory bodies. The bus played a prominent part in the discussions. Meetings of committees of the association took up the first day, while the second day was given over to addresses by prominent speakers.

The morning session Tuesday was called to order by President Shannahan, who introduced Col. J. Franklin Bell, chairman Board of Commissioners of the District of Columbia. Colonel Bell welcomed the association to the "town meeting," stating that Washington is the nation's town, and so every one has a right to be there and enjoy its facilities.

Senator William B. McKinley, Champaign, Ill., greeted the association as a former electric railway man. Next to fire, he said, our greatest discovery is that of electricity. In a few words he sketched the growth of the electrical industry from its beginning up to the present time.

The association was welcomed also by Elliot H. Goodwin, vice-president of the United States Chamber of Commerce. He said that the Chamber of Commerce is representative of all the business interests of our country, among which is the American Electric Railway Association. He explained briefly that the new Chamber of Commerce Building in Washington is available as a contribution to the work of the various civic organizations represented in the national body.

In his presidential address Mr. Shannahan reviewed the status of the electric railway industry for the year 1924. He showed that the electric railways have improved their condition both in a material and in a financial way. He quoted figures to show that the industry had held its own during the year and that the outlook for the present year is even better. These figures were embodied in a statement given out to the daily newspapers some time ago by him and referred to at the time in ELECTRIC RAILWAY JOURNAL.

The formal address of the meeting was delivered by Interstate Commerce Commissioner John J. Esch. He sketched the regulation of interstate commerce as defined in the Constitution of the United States. The development of the various interstate industries of the country was shown, covering the entire history of the nation. The portion of Mr. Esch's speech dealing specifically with electric

Owen D. Young's Tribute to Mr. Storrs

I SHOULD like to join General Tripp in congratulating the president of the association and the association itself in gaining as your managing director Mr. Storrs.

As I have been thinking about it, you have an industry, but perhaps you haven't an art; you have a trade, but perhaps you haven't a science, and I take it, it will be the business of your managing director to develop the science of transportation in your field. That is to say, to collect that body of things known in order that you all may benefit. And it is the kind of thing which is always done when need arises. We suffered from typhoid fever, from diphtheria, from malaria, and finally the time came when we suffered no more from those diseases. Great heroism and suffering had been shown to avoid those plagues. People had prayed and suffered, but the plagues existed. Nothing really happened worth while

OWEN D. YOUNG

until a man whose business it was to find out about that particular difficulty sat down in his laboratory and his study and devoted his time and attention solely to that particular job, and when he did, the germ was isolated, the specific ways found, and the disease disappeared.

Now, to the extent to which you have diseases in this business, you are adopting that same policy, and that policy will succeed. It depends only upon the capacity of your reserve worker and, fortunately, of that we have no doubt, and second, it depends upon the confidence and belief of the administrators of the properties in the man and the specific help which he proposes, and of that you are assured.

Typhoid would not have been eliminated if the physicians of the world had not confidence enough in it to inoculate. So Mr. Storrs can render you no service unless you at least try to follow the formula which he proposes. If you will do that, and give him your support, then I am sure that your difficulties will be solved—not tomorrow; you must be patient about it, but ultimately they will be solved.

And so I congratulate you on this step forward. And difficult as the job is, I congratulate Mr. Storrs upon the opportunity which its very difficulties present.

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railways is abstracted elsewhere in this issue.

A spirited talk in characteristic style was given by Peter Witt, traffic consultant and formerly street railway commissioner of Cleveland. Mr. Witt recited many of his experiences in the street railway business, some of which indicated opportunities for great improvement. Mr. Witt's address is abstracted elsewhere in this issue.

Following Mr. Witt's address the meeting adjourned to the south lawn of the White House, where a picture was taken with President Coolidge.

Afternoon Session

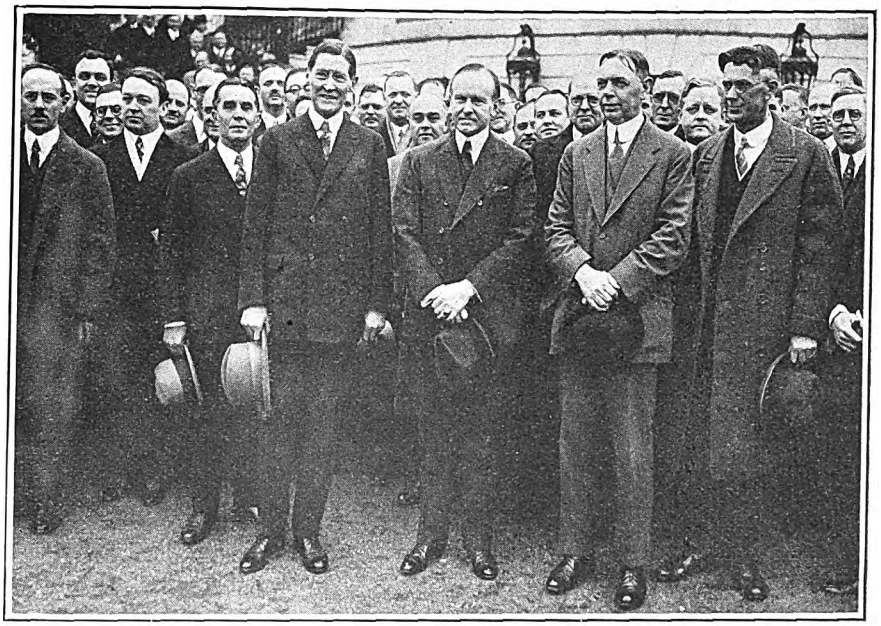
At the afternoon session, J. G. Barry, vice-president General Electric Company, read a paper outlining the views of the manufacturer relative to the electric railway industry, with particular reference to the view of the electrical manufacturer. This is abstracted elsewhere.

A rising vote of thanks was extended to Mr. Witt and Mr. Barry for their contribution to the program on motion of C. E. Morgan, vice-president and general manager Brooklyn City Railroad. Commenting on Mr. Witt's talk, M. B. Lambert, manager railway department Westinghouse Electric & Manufacturing Company, said that in paying deserved tribute to Mr. Birney for his work in developing the safety car Mr. Witt had failed to give credit to himself for the car which has been called by his name. Mr. Lambert also said that credit was also due to P. N. Jones, late general manager Pittsburgh Railways, for the development of the low-floor car. Development of a small number of standard trolley car designs with standardized equipment was advocated as a means of improving conditions in the railway industry.

Referring to the talk of Mr. Witt, Mr. Morgan called attention to the importance of having electric railway executives ride in their own cars. From his own experience, he said, great benefit is derived by the railway manager from this first-hand contact with employees and customers. An opportunity is available for individual contact with the men in charge of the car and valuable suggestions may frequently be obtained by contact with the passengers.

Miss Helen Sterner of Lorain, Ohio, discussed the subject of electric railway service from the standpoint of the feminine passenger and entered a plea for consideration of the woman's viewpoint in judging the character of service being rendered to the public.

Continuing with this topic of improving service, C. D. Emmons, president United Railways & Electric Company, Baltimore, Md., discussed briefly the work of the service department in his company. Its primary object, he said, was to get the viewpoint of the car rider. After getting this viewpoint, and in adopting steps to improve service, promptness in applying a remedy is considered one of the most important factors. "Do it now" is the motto of this department. Mr. Emmons added that so far as service department work is concerned this motto is based on the thought that things promptly done are twice done. On the subject of standardization, he said that improvements in the apparatus used on cars were one factor responsible for the large number of types developed, and that lack of standardization is largely attributable to this cause.



PRESIDENT COOLIDGE GREETS THE LEADERS OF THE INDUSTRY AT THE MIDYEAR MEETING

Speaking from the car rider's viewpoint, Walter Drey, vice-president and general manager *Forbes Magazine,* said that many small incidents and conditions may affect the car rider's impression of electric railway service. He mentioned the matter of illumination in cars as a subject that was worthy of serious study. Contact between trainmen and the public is particularly difficult, according to Mr. Drey, because it is a group contact rather than that of individuals. Situations which might readily be handled between individuals become productive of irritation and bad feeling when the contact is with larger groups. He advocated study of crowd psychology as a means of determining methods of improving public relations of the industry.

W. H. Sawyer, president East St. Louis & Suburban Railway, called attention to the attendance at the meeting and compared this with the conditions regarding previous electric railway conventions attended by Mr. Witt. Mr. Sawyer called this another day, and he referred to the audience as a 1925 group of electric railway operators. He also recorded the fact that it was a representative of the public, in the person of Mr. Witt, who during the morning session had advocated zone fares and who had criticised public service commission regulation of electric railways.

President Shannahan prefaced his introduction of the newly elected managing director of the American Electric Railway Association by saying that the need for this step had been developed from a realization of the lack of a direct tie between the owners of electric railway properties and the activities of the association, which are carried on primarily by the managements of these properties rather than by their owners. In handling situations of national importance, he said, there is a limit beyond which the operator or manager cannot go. In the administration of the National Electric Light Association he pointed out that a policy committee had been formed to overcome just this situation. The advisory council of the American Gas Association performs the same function. The American Electric Railway Association executive committee had therefore decided to take a leaf from the experience of these other associations and had formed an advisory council which consists of the following members: B. C. Cobb, Owen D. Young, Guy E. Tripp, Samuel Insull, Randall Morgan, L. S. Storrs, H. G. Bradlee, Nicholas F. Brady, Britton I. Budd, F. R. Coates, Samuel M. Curwen, Frank L. Dame, Henry L. Doherty, C. D. Emmons, P. H. Gadsden, Thomas N. McCarter, S. Z. Mitchell, J. H. Pardee, H. Hobart Porter, Paul Shoup, R. P. Stevens, A. W. Thompson, and J. N. Shannahan, president American Electric Railway Association, ex officio.

At the initial meeting of this council, held in New York City on Feb. 3, 16 members were present. It was apparent at this meeting that an opportunity existed for doing widespread constructive work in improving the situation of the electric railways. It was also apparent that this work must be put in the hands of some one individual to direct and co-ordinate. Mr. Shannahan announced that Lucius S. Storrs, president the Connecticut Company, had been elected to this newly created position, with the title of managing director of the American Electric Railway Association. Mr. Shannahan went on to say that this new activity will give the industry an opportunity for taking up nationally the problems affecting its interests just as soon as it becomes evident that such questions are of national significance. He said that the advisory council has agreed to underwrite the cost of this work until it could be distributed among the individual companies who are to receive its benefits. Steps will therefore be taken to distribute the expense resulting from this new activity.

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At the conclusion of President Shannahan's remarks, Mr. Lambert said that the association and the industry owed its president an expression of appreciation for his initiative and action which had resulted in the formation of the advisory council and in the election of a managing director of the association.

Motor Buses Discussed

A paper on motor buses from the electric railway viewpoint was read by H. A. Mullet, assistant general manager the Milwaukee Electric Railway & Light Company in the absence of the author, S. B. Way, vice-president and general manager of the same company. Mr. Way's paper appears elsewhere. At the conclusion of the paper Mr. Mullet answered a number of questions relative to the operation of buses in Milwaukee. He described the conditions under which seven-passenger sedan automobiles are run in competition with the electric railway company's service, and the system of fare collection used on buses of the railway company. He said that in interurban service the buses had shown earnings which paid the entire cost of operation and depreciation, together with a slight return on the invested capital.

The motor bus was considered from the motor vehicle viewpoint in a paper by T. R. Dahl, secretary the White Company, representing the National Automobile Chamber of Commerce. This paper appears elsewhere.

Following the presentation of the paper, President Shannahan commended Mr. Dahl on his extremely fair view of the relation between the automotive and the electric railway industries and said that the association and the electric railway industry owed Mr. Dahl a vote of thanks for his able presentation of this subject.

Then followed a consideration of the need for co-operative treatment of the transportation requirements in a city, and a spirited discussion ensued on the relations which should exist between an electric railway company and an independent bus company operating on the same streets. The principal speakers were Col. A. T. Perkins, manager for the receiver United Railways Company of St. Louis, and T. S. Wheelwright, president Virginia Railway & Power Company, Richmond, Va. At its conclusion President Shannahan declared it to be the policy of the association to stand for fair tactics between rival transportation systems.

J. C. Thirlwall, General Electric Company, discussed the development of the electric bus drive recently perfected by his company. He said that in general the trend today is toward bigger and bigger buses, both of the single-deck and double-deck type. The bigger vehicle has compelled the use of a bigger power plant. The six-cylinder engine of greater horsepower is being generally adopted. Using the mechanical drive that has been a standard part of automotive equipment on these larger vehicles with their larger power plants has developed difficulties that were never apparent in the pleasure car or in the smaller and earlier forms of the bus. It is almost amazing to the average railroad man who takes up bus operation for the first time, the terrific maintenance cost and the comparatively brief life of the driving mechanism when he compares it with his rail car expense. In analyzing the cost of maintenance, it is found that the mechanical drive itself is largely responsible in the hands of the average operator. The gear shift and clutch, handled by the ordinary driver, is a weapon of mechanical assault and battery on the engine itself, on the clutch, on the gearing and on the axle and tires.

It was to minimize the terrific shocks and strains that are inherent in the mechanical drive that the gas-electric drive for buses was recently developed and perfected.

Electric drive simply means taking out the gear box, the transmission gearing and the clutch, and in some instances taking out the differential drive and substituting for it a dual drive, removing parts that are inherently short-lived and high maintenance parts and replacing them with an electric generator, directly connected to the engine and with a motor or motors of the ordinary railway type.

By actual tests, he said, it has been found that in city service the engine revolutions per mile are reduced from 15 to 21 per cent; that the maximum engine speeds are reduced approximately 40 per cent; that the inspection of the engine, which many of the larger companies put on a 2,000-mile basis, can be stretched out to 4,000, 5,000 or 6,000 miles, which in itself saves materially in cost, and that, better than that, the electric equipment permits of an almost instantaneous test of the efficiency of the engine by connecting the generator to a water rheostat and taking ammeter readings at a given engine speed. That permits in a few minutes an exact determination of the condition of the engine which can only be had at the present time by taking the engine off the car and setting it up on a stand dynamometer test, which is a long and extremely expensive performance.

A bigger thing than maintenance, however, is the fact that it was found by an extensive series of tests that a higher schedule of speed could be maintained with the electric drive without abuse to the equipment or without discomfort to passengers than is possible with the mechanical drive, and as railway men I think we all realize that high schedules are not only the greatest economy that can be effected in railway operation, but they are also one of the best means of selling transportation. In answer to a question he said that he believed it possible ultimately to develop this type of drive so there would be little if any increased weight in the mechanical construction.

A resolution proposed by C. D. Emmons was passed expressing the thanks and the appreciation of the association to the speakers and various organizations which had co-operated to make the meeting a success, particularly the Chamber of Commerce, the management of the New Willard Hotel, the committees of the association on transportation, subjects and meetings, and dinner arrangements. Thanks to the local railway companies and to J. H. Hanna, vice-president in charge of operations Capital Traction Company, were also included in the resolution.

President Shannahan announced that the annual convention of the association would be held in Atlantic City during the week beginning Oct. 5, after which the meeting adjourned.

The last event on the program of the meeting was a banquet in the ballroom of the New Willard Hotel. More than 700 diners were present to enjoy one of the best sessions of the entire convention.

During the dinner the guests were entertained by a number of vocal selections. Much amusement was occasioned by the distribution of a four-page leaflet, "One Bell," made up to resemble a newspaper. The publication of this sheet was arranged by Robert Dougan, publicity agent Capital Traction Company, and printed with the assistance of the Washington *Times*.

After the dinner the guests listened to three speakers who discussed topics of interest to the electric railway industry. The speakers were G. F. Hamilton, president Capital Traction Company; Gen. Guy E. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, and Matthew C. Brush, president American International Corporation. By special request of Mr. Brush, Owen D. Young, chairman of the board General Electric Company, spoke a few words of congratulation to the association and to Mr. Storrs concerning his appointment as managing director. These remarks appear verbatim elsewhere. At the conclusion of the speeches there was informal dancing.

AT THE MEETING of the executive committee of the American Electric Railway Association held in Washington Feb. 16 the following statement of principles regarding the motor bus was unanimously adopted:

Principles Regarding the Motor Bus

Recognizing that there is a place for the bus in local transportation, the executive committee of the American Electric Railway Association subscribes itself to these convictions:

1. No medium has yet been developed which alone can take the place of the electric railway in moving large numbers of persons during morning and evening rush hours in cities. There is a place for the bus in transportation as an auxiliary of or supplement to and, in some instances, substitute for electric lines.

2. Electric railways are in the business of providing transportation in their respective communities. It is their duty to supply all local transportation, both by electric railways and buses, essential to good public service. When supplying such service by rail cars, buses, or both, they should be protected against competition in the operation of all such lines.

3. Buses should be regulated by law as common carriers and the effort to make bus regulation uniform throughout the United States continued and encouraged.

4. Both buses and electric railways should bear proportionate taxes and other public obligations fairly chargeable to them as public carriers.

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The Car Rider's Viewpoint*

By Peter Witt

Street Railway Consultant, Cleveland, Ohio

Observations on Railway Operating Methods in Nineteen Cities —Better Transportation Is Demanded Rather than Cheaper Transportation—Larger Field for Railway Service Pointed Out

I HAVE been in 19 cities and I have ridden cars until I was sore but satisfied. I have seen many things that the owners of transportation companies have never seen; and my advice to you is—get acquainted with your own product and you will be able to appreciate the feelings of the people that you are doing business with.

Most of the people who are engaged in transportation seem to look upon their customers as enemies. It is the most remarkable business that you can imagine, where every owner thinks that every fellow who gives him a nickel is his enemy. You sort of have an attitude toward him like a merchant would have if he put a bulldog in front of his store after he spent money in advertising a cheap product. It doesn't work that way.

Take your engineers and your master mechanics and general managers and send them around the country and let them see what other properties are doing. Don't go there announced, to be entertained by the other fellow, but go there as a stranger, because it is my observation, of course, that we do make progress, and you then will see the many things that I have seen in the 19 cities that I have been doing car riding in, and you will have many a good laugh.

Of course, the common thing that I meet in most places is that very few transportation people keep their track in good condition. It seems to be the universal rule that when a joint commences to show a break and the equipment starts to hit it, you don't send the man out to repair it, but you wait until the joint is gone and the rail on the opposite side is cupped. And after the equipment has pounded itself to pieces for 2 years, you go out and put in a new piece of equipment. That isn't the way a car rider ought to be treated.

You will become informed of many things if you will send your men around the country, so that they may observe how things are being done and come home and tell you, so that you may profit by it. In every town something is done better, and some things are done worse than in any other town; all you have to do is to pick up the good things and bring them home in a collection and then you will have all the good things for your own town.

I have ridden in street cars where I found transfers three weeks old. I have seen conductors punch transfers with a nail. I remember one city I got into, where I was waiting for the car to start. All of a sudden a fellow came along and I looked at him and I thought he was a curve greaser. He had on a pair of overalls—not even made of the checked stuff, but made of the plain blue. I looked at him and thought, "This fellow is riding the car with his grease bucket; I wonder if he keeps the grease off of the passengers." But I was mistaken; that wasn't the fellow who greased the curves, it was the conductor himself.

PETER WITT

Now, you wouldn't like, if you were riding the street car, to have a fellow in the uniform of a curve greaser come up to collect the fare, would you? Well, the chances are that that corporation in that particular city, through the individuals in control, did not like it, but the officers never rode a car, they didn't know the way the conductor was dressed.

In that same city I saw a thing that amused me very much. I noticed that the trail pullers running around in the daytime had a night shirt on them; they were dressed in a night shirt made out of canvas. Well, I never had seen a coupler incased in a canvas bag, and I said to one of the men operating the property, "What's the idea of putting canvas over the couplers?"

"Why," he said, "that will keep the dust off of them."

Now, that sounds funny to you, but I saw it with my own eyes, and saw the man take it off and then put it on. Imagine a railway spending good money in buying canvas bags to put over couplers to keep the dust off of them.

Can you wonder that sometimes the car-riding public doesn't take kindly to the trials and tribulations that you go through, when they see such nonsensical performances? That is patent, you know, when you go out if you merely observe those things. You can't observe them if you stay home; you can't get next to them if you go down to Young's Pier at Atlantic City, but if you travel all over the country you will become acquainted with them.

I have been in cities where the cars have a horrible appearance and are rusty for lack of paint. The operators are careful about having the carhouses, where the cars remain for 6 hours at night, nicely painted, but they will allow the cars, which are out on the street for 18 hours a day, go without any paint. Remember that it is just as important, if not more so, to keep the cars painted as it is to see that the carhouses are in good condition and painted.

To me, there was only one man in the United States who really ever understood the question of transportation, and that was George Pullman. When he conceived that wonderful thing that we now enjoy, known as a sleeping car, and took it to New York to peddle it, he was buffeted from one sidewalk to the other, and he was confronted with the statement by the people who had money that it wouldn't do, and that it would increase the cost of transportation. And to that, George Pullman had just one reply, and that one reply was that the people did not want cheap transportation, they wanted better transportation!

You can't make transportation too good. The better you make it the more car riders you will see, and the worse you make it the fewer car riders you will sell. Now, you have got to understand that you are merchants, that you are selling something that people must have, and that people are eager to buy if you will merely deliver the stuff that they want.

You are disturbed about the automobile. Now, I am not disturbed about the automobile. I think the privately owned automobile has been a boon to this industry. The private automobile, to the extent that it brings people down in the morning and takes them home in the evening, during the rush hours, is a benefit to you because it relieves you of part of the peak which is the unprofitable end of your business. Of course, at one time it was believed that that was the profitable end. You know, they used to write franchises which stipulated that people should be carried for so much a ride, but when the hour of heaviest peak came, then the charge was reduced, when it cost most. Now the privately owned machine is not hurting you, and when you realize in your cities that every fourth or fifth person is the owner of a machine, don't get into the frame of mind of thinking that he is going to hurt you, because he is not. And when you see 20,000 and 30,000 and 40,000 machines on the highway going this way and that, don't figure that is a loss to your business, because it is not. Don't assume for a moment that when a man has taken a pleasure ride in the car that he would be on the street car if he wasn't in the automobile, because he wouldn't.

The automobile has merely made it possible for people to take more rides that they wouldn't take if they had to use a street car. It is not a loss of business to you. Then, of course, after that comes the bus, which now is agitating this industry. I don't know what the bus can do, and neither do you. It is something new, and there isn't anything yet by which we can gage it. All that we can say about it

*Abstract of a paper presented at the Midyear Meeting of the American Electric Railway Association, Washington, D. C., Feb. 17, 1925.

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is that the bus is an economic factor and that if you can transport people on rubber tires for less than you can move them on steel wheels on steel rails, the bus will supplant the street car, and nothing can prevent it.

However, I don't think that time ever will come. I know that there isn't anything in this world that is so frictionless as a street car, a steel wheel on a steel rail. I know that there are car bodies in this country that have been on wheels for 35 years. I know that no bus body will remain on wheels for 35 years, even if you carry three mechanics on every trip. I know that there are motors operating on trucks and under street cars in this country that have been obsolete for 20 years, but they are still turning around. And I know that there isn't an internal combustion engine made, or that ever will be made, that will run 35 years!

I know that I can take a pinch-bar and move a gondola with 80,000 lb. of coal; that tells me that there isn't anything as cheap as steel to steel. So I don't subscribe to the theory that seems now to be running rampant among this fraternity, that the day of the street car has passed and the day of the automobile is here, because it is not. The automobile or the bus can be used, of course. There is a place for it as well as for the street car, but it will never supplant the street car in the cities of this country, and it shouldn't, and it won't, unless it can do it cheaper—and only time will be able to demonstrate that to us.

Transportation Acts and the Electric Railways

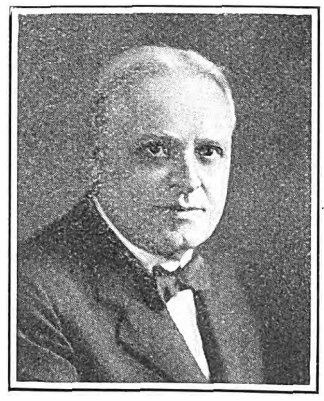
By John J. Esch

Member Interstate Commerce Commission

Despite Original Franchise Provision a Fare Higher than 5 Cents Is Now Deserved—Legitimate Advertising Will Improve Public Relations—Stock Ownership by Employees and the Public Gives Them a Stake in the Success of the Property

WITH reference to the immediate interests of the electric railway industry I might say that the original interstate commerce act in defining a common carrier declared that it was engaged in the transportation of persons or property by railroad. There is no distinction made in Section 1 of the original interstate commerce act as between the steam and the electric line, and ever since Frank Sprague of New York developed the practical trolley at Richmond, in 1888, electric interurban lines engaged in interstate commerce have been subject to the jurisdiction of the Interstate Commerce Commission. In numerous cases we have passed upon your rates and fares and charges, and they have gone to the Supreme Court and the jurisdiction of the commission has been sustained.

In the transportation act of 1920 there has been an exception made with reference to street, urban or interurban and electric lines which are not a part of a general system of steam railroad transportation. I remember distinctly that your people were not of one mind as to the scope of the proposed legislation. There were some of you who believed that you should come under the full provisions; others were opposed to such a proposition. Some were willing to come under title 3, the labor provisions; others were opposed thereto. With this contrariety of views, the committees of Congress formulated the



JOHN J. ESCH

transportation act as it is today. Each individual case, therefore, will have to be determined upon its own merits.

On Jan. 5 the Supreme Court of the United States handed down a very interesting decision with reference to two Ohio traction companies. The city of Wellsville and the village of Hebron brought action. The interurban lines supplying this city and this village also connected with cities in Pennsylvania and in West Virginia, thus making them interstate common carriers. The common carrier had an interstate level of rates. The intrastate rates were lower. It sought to have the intrastate level of rates raised to the level of the interstate. The commission granted the relief. This city and the village took the case to the Supreme Court, and that court affirmed the decision of the Interstate Commerce Commission, so that the carriers were enabled to raise the intrastate rates to the level of the interstate—and like relief may be granted in other cases where a like situation is presented.

Street and interurban electric lines have been suffering under two handicaps—the nickel and the jitney. The 5-cent fare was originally a part of your charter or your contract rights. Being incorporated in a charter or in a contract made with the Council, it was considered as immutable as the law of the Medes and the Persians, and for a long time, notwithstanding your presentation of increased costs of labor and materials, the 5-cent fare remained a constant.

You ought to increase the fare—and I have noticed in the address made by your president that the average fare now has attained something in excess of 7 cents. The nickel was considered as a sacred number, but I take it that 7 is more sacred because you will find it justified in Holy Writ.

Jitney competition, which was so severe a few years ago, is in a way resolving itself because you are laying your cards upon the table before common councils, your patronizing public, and the regulatory bodies; you are meeting them across the table, and to the degree in which you manifest frankness in every detail can you expect relief.

I am glad to note that the situation of electric lines is better than it has been in prior years; far better than it was during the war, during 1919, during 1920, during 1921, and even a part of 1922. Reading your proceedings in 1921, I noticed there was a tone of pessimism throughout the addresses and there was also in the statistics offered; but I think you have seen that the sun is shining through a gap in the range and that the slough of your despondency is now being brightened by the full sunlight. At least, I sincerely hope that that is being realized.

It would be my suggestion that you continue your plan of advertising what you have to sell, of taking the public into your confidence, of increasing your public relations to a point where there be mutual confidence between yourselves, the patronizing public, and the regulatory bodies. By doing that, there will be a better feeling between yourself and your employees. You have a right to tell the patronizing public that they owe you something; you have a right to tell them that by reason of these electric lines it has been made possible to relieve the congestion of the great cities and to give the man of moderate means a chance of buying a home out in the open spaces where he can raise his family at a reasonable cost. You have a right to tell the manufacturer and the merchant that because of your lines and your facilities you are bringing customers to their very doors. These are legitimate methods of advertising, and you have the full right of going to the uttermost limit in presenting your views to this public.

You have a right also to try to secure ownership in your securities, on the part of your employees and the patronizing public. Have you noticed the result of an experiment tried by

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the New York Central last week? It put out 35,000 shares of its stock, par value $100; first chance of purchase by employees. There were over 42,000 applicants for the stock. The company doubled the amount of the stock that could be subscribed, and the company today has 42,000 more stockholders than it had two weeks ago, and it has disposed of $6,800,000 in stock at par. What is the significance of that? It means that 42,000, practically one-fourth of the employees of the New York Central System, now have a financial stake in the success of that great railroad.

One Railway's Experience with Buses*

By S. B. Way

Vice-President and General Manager
Milwaukee Electric Railway & Light Company

Where, When and How They Should Be Employed — The Results Obtained by This Company Show that It Is Essential to Use the Best of Equipment and to Be First to Render the Service—Principles Found to Be Successful Are Enumerated

THE answer to the question "When, where and how should motor buses be used by electric railways?" can, from the experience of at least some of us, be compressed into a few words, namely: Anticipate demands and opportunities for bus service; be first to render such service; employ only the best equipment and personnel. Analysis of a particular situation will illustrate the point.

Take the case of an electric railway system operating something like 230 miles of city track and 260 miles of track in suburban and interurban service. The city tracks are practically all in paved streets. The suburban and interurban lines are largely on private right-of-way. This railway system serves a total population of about 800,000. The interurban cars reach the centers of the principal cities over tracks used also for local street railway service. The suburban and interurban lines are in every instance directly or closely paralleled by concrete or other hard-surfaced roads, and the area between these lines is in practically all instances further supplemented by similar hard surface roads. These hard surface roads extend to practically all towns within a radius of 100 miles or more from the principal center from which this railway is operated.

No Restrictions in State Laws

The state law is such that any one can go into the bus business either in the city or in the country, or both, upon the mere filing with the Public Utility Commission of a statement of the general route over which such buses are to operate, a proposed general schedule of hours during which service will be rendered and a general statement of the rates of fare to be charged. This statement must be accompanied by an indemnity bond for the payment of damage claims up to the amount of $2,500 for any one individual and $5,000 for any one accident.

S. B. WAY

The Public Utility Commission has substantially no discretion in the matter of approving such applications where accompanied by indemnity bonds. The law especially provides that the fact that the route parallels a street railway system shall not be taken into consideration by the commission in passing upon the adequacy of the application or the bond. After the commission has once discharged its rather perfunctory duty it loses jurisdiction unless notice is given by the bonding company of the cancellation of the bond, whereupon the commission is required to cancel its certificate. The commission has no means whatever of ascertaining whether or not the carrier observes his proposed route or operating schedule or even adheres to his filed rates of fare.

Under the law, cities and towns may require the payment of license fees by buses or so-called bonded carriers, which license fees, however, are limited to amounts reasonably to compensate the cities or towns for wear and tear on streets and bridges and for the cost of regulating traffic. The cities and towns are not permitted to levy a franchise tax as such. The only taxes assessed against such carriers are the taxes applicable to any business and property, the federal bus tax and the state auto license fee.

The only regulation of the service is that imposed by local sheriffs or police in respect to observance of rules of the road, speed ordinances and the like. The meager protection of the public against the operation of more or less irresponsible buses or common jitneys embodied in the requirement of the filing of bond, as described, was enacted only after one city in this state became infested with as many as 1,500 jitneys at one time and where the jitneys in some of the smaller cities practically ruined the street railway business. The cost of insurance coupled with the war activity, higher cost of automobiles and their operation, and the general and substantial advance in wages operated practically to eliminate the old fashioned 5-cent jitney or even the converted touring car operating at a 10-cent-fare.

In this situation and subsequent to the enactment of the bonded carrier or so-called jitney law, buses first made their appearance as a medium for extending interurban railway service to points beyond rail heads. These buses were first operated by individuals but were shortly taken over by the railway and operated in its own name. The small patronage enjoyed by these buses, the low earnings and the comparatively high expenses per bus-mile gave the railway officials the impression that buses were not likely to become extremely popular. These initial operations, however, were undertaken over gravel surfaced highways and with bus equipment not in any way comparable to later equipment in respect to comfort or attractiveness to passengers.

As soon as the first 36-mile stretch of concrete road paralleling one of the interurban railway lines was completed, a fleet of, at that time, relatively high-class buses was imported from a bus operating organization which had achieved a considerable measure of success in its operations between neighboring cities in a near-by state. These buses were operated by experienced bus men and the organization appeared to have a considerable measure of responsibility. As additional roads were completed, paralleling the interurban lines, these people experimented with different routes until they located their equipment on routes which would yield the largest revenues per bus-mile. It early became apparent that buses of this character operating on concrete or other hard, smooth-surfaced roads were taking away an appreciable amount of traffic from the railway.

Competition Could Not Be Ignored

The railway management early concluded that it could not afford to ignore the possibilities of such bus operation, particularly under these circumstances of total lack of protection by state laws or municipal ordinances, its obligation to operate regularly and safely at fixed rates of fare and the charac-

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teristic tendency of the public to prefer travel on rubber and soft leather cushions in modern vehicles. The situation was squarely put up as to whether the electric railway should lie down and take a good licking, or whether it should stand up and make an effort to remain the predominant factor in organized transportation service in the district served.

It was quickly recognized that it was impracticable to attempt to retain the business for the electric railway by attempting to compete with modern high-class buses operating on close headway with 15 and 20-year-old railway cars, well maintained to be sure, but nevertheless lacking much in the way of novelty and attractiveness of interior finish that was offered by the buses. It was believed that unrestricted, unregulated and uncorrelated free-for-all bus service, on magnificent hard-surfaced roads and operating substantially tax free, could result in but one thing—the destruction of the railway and the complete disintegration of organized and responsible transportation service.

Meeting Competition with Buses

There appeared to be but one course left open to the railway management, namely, that of meeting bus competition with buses. The railway proceeded according to its best judgment, procured buses which it believed were best adapted to meet the situation which confronted it and launched into the bus business. It started out with an announced policy of recognizing that a change in transportation methods had occurred, and that it was prepared and proposed to give the public the best transportation service of whatever character the public wanted and at the lowest consistent cost. The railway made numerous grievous errors in the initial selection of its equipment and rapidly awoke to the fact that time-honored ideas and prejudices of electric railway men could not be successfully grafted onto the bus business.

Bus companies multiplied in the district and the railway company was kept extremely busy keeping up not only with the rapid development of bus lines as fast as new highways were completed and opened, but also in keeping up with the rapidly changing styles in buses. Each new competing bus organization brought out a type of bus which it believed would be most attractive to the public and which would gain for it the lion's share of the patronage. The railway company utilized its inherent advantages of established credit and superior purchasing power and its experience in respect to standardized methods and training of personnel, all with the result that it rapidly acquired fleets of different types of buses, each carefully selected with respect to the particular class of service to be rendered. In each case the equipment was made the most attractive that could be devised with reasonable regard for practicability in operation.

This policy began to tell, and within a year from the time competition was first encountered in parallel bus operation, the first competing organization sued for peace and sold its equipment to the railway on the basis of the depreciated value of the equipment and with no allowance for going value, good will or the like. Numerous other competing organizations operating buses of various types have found the railway competition too severe, not from the standpoint of cutting rates, but from the standpoint of absolutely reliable, courteous and safe service in vehicles of the highest possible standard, with the result that they have one after another likewise sued for peace. The refusal of the railway to pay tribute to get rid of troublesome competition has, it is believed, deterred many bus men from entering the field.

Making Bus Service Pay Its Cost

In the meantime the railway has been able to operate its interurban bus service on a basis of recovering the full cost of operation, including depreciation, and with a substantial contribution toward a full reasonable return. It has not been able entirely to eliminate destructive competition as yet.

The latest development in such competition has been the utilization of high-class seven-passenger sedan cars, on which license fees and taxes are very light, which operate at extremely high speed and which offer the public carriage in what amounts to a private limousine. Careful study of this type of competition reveals the surprising fact that such buses can exist on revenues as low as 12 to 14 cents per bus-mile. This surprisingly low cost of operation is accounted for by the fact that buses of this type are quickly loaded and the loading is accomplished with few stops. When the buses are once loaded, they run practically without stops and at high speed from one terminal to the other. The high speed reduces the element of driver's wages per bus-mile and does not materially increase maintenance or other operating costs per bus-mile. Such cars are available at less than $2,000 each, and even in relatively hard service can be operated so as to keep the factor of depreciation down to about 1 cent per bus-mile.

Experience is demonstrating that this character of competition can hardly be successfully met by any of the conventional types of 15 to 30-passenger machines, and that where such competition exists the railway or other organized and responsible transportation agency must employ its purchasing power, operating organization and its best experience to meet the demands of the public in developing a high-speed small car service which the public will prefer to that offered by competitors.

While this intensive development was going on in the railway company's interurban and suburban territory, the operators of a bus line in another city connecting depots with a department store conceived the idea of procuring a so-called franchise for the operation of buses paralleling certain of the company's best city railway lines. Notwithstanding the law was fairly clear to the effect that cities could not give any franchise for the operation of buses, but could impose on bonded carriers procuring certificates from the public utility commission reasonable license fees to compensate for wear and tear on streets and bridges and for the cost of regulating traffic, these parties caused to be introduced into the city council an ordinance authorizing the exclusive operation of a line of buses and proposing to pay the city a license fee of $100 per bus. Prior to the filing of this application for a so-called franchise the railway company had anticipated that some one was likely to begin the operation of buses paralleling its best street railway lines. Demonstrated popularity of the interurban buses could lead to no other conclusion.

Considerably in advance of any talk whatever of the inauguration of local city bus service, the company accordingly placed an order for what were at that time the highest types of single and double-deck buses available in this country. In advance of the actual receipt of these buses, the company had filed its application with the public service commission for the necessary bonded carriers' certificates. Upon filing the application by these outside parties for the so-called franchise in the city, the company, with the cooperation of the manufacturer in hastening deliveries, immediately inaugurated service. Through a period of a year and a half the railway company continued and constantly improved its local operation in spite of many attempts to harass it.

Extending City Rail Lines

In the meantime, the company had not overlooked the places in its city transportation system where service was required but where the volume of traffic could not by any stretch of the imagination begin to justify the heavy initial outlay required for the construction of tracks, paving and other accessories of a street railway. These lines were generally in the outskirts and the locations were not in any way attractive to independent bus operators. In these situations, the company installed high-class bus service at railway rates of fare and exchanged transfers with the cars. These local city bus lines were at first operated at a net loss represented by the total cost of operating the buses, because in the beginning they did not produce any appreciable increased riding over what would have come to the railway without the buses. However, by keeping the bus equipment strictly high class and operating on regular schedules, good weather and bad, and practically independent of the quantity of snow, the public began to increase its patronage to the point that these lines can as a whole now be said to be at least entirely self-supporting in respect to the full cost of bus operation, exclusive of return. The surplus over and above this expense is making some appreciable contribution toward return. The main return from these buses, however, is in the improved position which the company occupies in the community, which is reflected by better patronage of its transportation system as a whole than would have been the case otherwise, and in the final conclusion of the city itself that it could not afford to invite outside bus operators to jeopardize the highly organized and complete local system of transportation.

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In attempting to fulfill its mission of rendering a complete and properly correlated railway and bus transportation system, this railway has found it necessary and expedient to operate something over 750 miles of interurban bus route and close to 50 miles of city bus route. The operation of these several bus services requires 132 buses of all types. The number is yearly increasing.

Principles Found Successful

The experience here briefly sketched has led the management to the following conclusions:

That the time to operate buses is before the other fellow gets the jump on the job.

That the place is wherever buses can render a useful service on a self-sustaining basis, whether necessarily correlated with the railway system or not.

That bus service should be inaugurated wherever the so-called independent operators attempt to horn in on the railway company's transportation business without being willing to assume all of the responsibilities and burdens which the railway organization must assume and carry.

That to render satisfactory and profitable service to the railways the buses must be of at least as high class as individual or so-called independent operators could or would procure.

That buses must be operated by a carefully trained and especially selected and supervised personnel.

This experience has also taught that where the buses are operated as a part of the railway system, i.e., at railway rates of fare and exchanging transfers with the railway, it is desirable that the buses be operated under the supervision of the railway transportation department; that they be painted the car colors, that the men wear the railway uniforms and that everything else possible be done to identify closely the bus with the railway system.

Where, however, the buses are operated as a competing or auxiliary service rather than as a part of the railway, it is desirable to paint equipment distinctive colors and even to distinguish special classes of equipment by different colors, as, for instance, parlor cars from regular cars. Such operation cannot well be handled by the regular railway supervisory force, and best results are secured from the organization of a bus transportation department in charge of a superintendent carefully selected for his adaptability to this service.

Engagement of Operators

The value of special care in the selection and training of bus operators cannot be overstressed. It is interesting to observe that it is possible, through the observance of such a plan, to operate buses over a period of several years and many hundred thousand miles of service, with lower average costs for injuries and damages expressed as a per cent of operating revenue than are experienced in the same situation in a railway, where the same care is used in the selection and training of railway platform men and otherwise in promoting safe and satisfactory railway service.

Manufacturer's Contribution to the Electric Railway*

By John G. Barry
Vice-President General Electric Company

Many Technical Gains in Last Few Years Have Added to Earning Power of the Railways—Means by Which Operating Companies Can Help the Manufacturer Are Standardization, Anticipation of Requirements and Correct Shipping Dates

JOHN G. BARRY

IN A recent message to our stockholders the president of the General Electric Company said, in effect, that the problem of a manufacturing corporation is threefold, and that its accomplishments must be measured from three points of view: (1) Service to the public; (2) to the employees, and (3) to the stockholders. The first consideration is "service to the public," and it seems to me that if we render efficient service to the public, both employees and stockholders will benefit. We feel that the manufacturers have rendered valuable service to railway companies, and while it has not been all that we would like it to be or that we hope to make it, nevertheless it has been of distinct benefit. From an engineering viewpoint manufacturers are prepared to have their engineers study your problems. In the manufacturing end we endeavor to carry stocks of the more popular types and sizes of apparatus and so to equip our plants that reasonably early shipments can be offered on apparatus not carried in stock.

In addition, electrical engineers have made contributions, such as the introduction of the automatically controlled substation and the light-weight motor and control equipment for light-weight cars, which have improved the service to the public and reduced the expenses and increased the revenues of operating companies.

There has been marked improvement accomplished in the design and efficiency of generating apparatus. I quote from a statement issued Jan. 15 to stockholders of the General Electric Company:

> Twenty years ago the efficiency of conversion of the energy of coal to electricity was a little over 10 per cent. Since that time the efficiency of the turbo-generator has been greatly improved, much larger units have been introduced, higher degrees of steam pressure and superheat with better auxiliary conditions have been adopted, so that we now realize an efficiency of conversion of approximately 19 per cent, an increase of about 90 per cent. We now seek to gain a kilowatt of energy from a pound of good steaming coal, which means an efficiency of 24½ per cent in the conversion of coal to electric power. Looking forward to the introduction of the mercury boiler and turbine, it is expected that these will further increase the efficiency of this conversion to 33 per cent, or more than three times as much as 20 years ago. What this means to the industry, and more particularly to the public as a whole, may be gathered from the following. In 1919 the average of the electric central stations throughout the United States was 3.2 lb. of coal to produce a kilowatt of energy. In 1923 the efficiency of the turbines and other apparatus in use in central stations had been so increased that the average was 2.4 lb. per kilowatt of energy, an improvement of 25 per cent. This is equivalent to a saving of 15,000,000 tons of coal per year, or $50,000,000 in the cost of coal alone, not taking into consideration the attendant advantages that this saving implies in the freeing of labor—human effort in the mining, transportation and handling of coal—as well as the capital required for these operations.

There has been a similar, but not so pronounced, improvement in substation apparatus and car equipment.

Manufacturers do not claim that in making these contributions they have been actuated solely by altruistic motives, for with no one is the truth of the Rotary slogan "He profits most who serves best" truer than with the manufacturer. However, in order that we may "serve best" and that both operators and manufacturers may profit, it is essential that we receive the co-operation of operating companies, and I wish to suggest one or two means by which such companies can render effective assistance.

How Operating Companies Can Help

First, adopt as far as possible the standards of manufacturing companies. We believe they have standard apparatus that will be applicable to practically any condition of service, and it is hoped that railway companies will accept such standards, even though they may not embody all detailed features which may be desired by individual companies. Perhaps many do not realize the importance of this or the relatively large increase in expense and delay involved in what may appear a minor change from standards. Detailed engineering instructions must be prepared, drawings changed and frequently

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new patterns or dies made, with consequent increases in cost and in time for producing such apparatus. We believe that the large number of different types, sizes and varieties of cars, trucks and electrical equipment now desired by operating companies could be substantially reduced if careful study were given to standardization of such apparatus, thereby allowing manufacture on a quantity basis, and by so doing that manufacturing costs and selling prices would be materially reduced.

The operating company can help the manufacturer by anticipating as far as possible his requirements, not only as regards new apparatus, but also supply materials.

Another method in which railway companies can help not only the manufacturer but also other railways is by not specifying shipments materially in advance of actual requirements. It is not unusual for us to be advised that certain dates of shipment are required and then, after the apparatus is completed, to receive a statement from the customer to the effect that they were not yet ready to receive it and asking that it be held. Had we been advised earlier that this material would not be required on dates originally specified, it would have permitted us to concentrate our efforts on apparatus which was urgently needed and thereby relieve some other customer of a very trying situation.

The manufacturers are not only willing but anxious to do their part, and I believe that if we all pull together we can expect and deserve a continuance of the improvement which the railway industry has shown recently.

Relation Between Automotive and Electric Railway Industries*

By T. R. Dahl

Secretary the White Company, Cleveland, Ohio
Representing National Automobile Chamber of Commerce

Standardization of Design and Excessive Size of Buses Should Be Avoided—Co-operation of Railway with Motor Vehicle Associations Will Give Excellent Access to Public Opinion

THERE is no doubt of the bonafide operation of buses by electric railways today. In the past there has been a strong suspicion among bus operators that electric railways began bus operations for the purpose of killing that kind of public passenger transportation, having accomplished which they would again furnish only transportation by rail. They suspected that the railways put "trick" in "electric" as a warning to competitors. Present operations by electric railways have effectively removed that suspicion.

Certain conclusions as to the use of the bus can admittedly be accepted, for the present at least, as major premises. First, buses are no longer considered as a passing phase of public fancy. They are here to stay. Second, buses cannot supplant electric railways in handling peak loads in congested districts in large cities. The use of the bus by railways is, therefore, a question of determining the proper place for each service.

It is generally admitted that buses should be operated as extensions of car lines in extending service into new territories where the traffic does not justify the necessary capital expenditure for rails and power. This economic condition exists very generally, as the cost of existing trolley lines is often four and sometimes five times the amount of annual gross revenue, and this means that if 6 per cent is considered a fair return, 24 per cent of the annual gross income must be set aside to pay interest and dividends on invested capital alone. Buses should be used as feeders to the electric railway lines.

Urban population in the United States is increasing much faster than that of the country as a whole. New building developments are rife in all live cities, and as homes go up in the outskirts of the city, transportation facilities must be provided to serve them. The high cost of construction and maintenance of street railways makes it impossible to extend them into such outlying districts except under exceptionally favorable circumstances. The solution in such cases lies in the bus.

In a number of cities the electric railways themselves have replaced certain lines and in other cities replaced their entire systems with motor buses. This has been particularly true where an extensive paving program by the city has loaded an entirely unjustifiable charge upon the electric railway. Rather than capitalize that additional investment buses have been placed in service, replacing the street car.

The history of city public utilities consistently proves them monopolies. One has but to recall several street car lines, electric light companies, gas and telephone companies operating in the same city. They have been universally unsuccessful until combined and operated as a monopoly. The transportation problem of a city is as much a monopoly as the water, fire and police departments of that city. Transportation being a monopoly, the electric railway, as the established responsible and experienced carrier of passengers, should undertake to furnish all passenger transportation in its community.

Don't Standardize the Bus Body to Look Like a Car

You are no longer selling 5-cent car rides. You are purveyors of transportation. The riding public is appreciating to a greater extent than ever that it must pay a fare commensurate with service. It is willing and anxious to pay higher rates of fare to ride in buses. Do not jeopardize that earning capacity of your buses by too great a standardization of bodies, either as to form or appearance. Give no suggestion to the bus rider by standardizing the bus body to look like a street car that he should only pay a street car fare. The bus is regarded by the rider as a Pullman service for which he is willing to pay a Pullman charge. Do not take a chance of giving that rider a day coach impression, for as surely as you do he will demand a day coach rate.

In the operation of bus lines it should be continually borne in mind that your best prospective customer is the automobile owner. I do not know of any better way of antagonizing him than by forcing him off the pavement or frightening him by a bus which at least appears to be nearly as wide as the pavement itself. Manufacturers of buses engaged in competitive selling must pretty much give the purchaser what he wants. Consequently the initiative in keeping bus widths within limits must come from you. The danger is not limited to losing customers, but even more important is the danger of punitive legislation limiting widths to an extent that will interfere with economic operation through limited seating capacity.

Some Advantages of Limiting Bus Dimensions

This is no mere chimera. Some states have already limited by law permissible widths of buses below 90 in. The only manner in which to avoid the swinging of the pendulum from the present liberality in width limitation to stringent and unreasonable width regulation is by voluntarily limiting your bus body widths to conform to 18-ft. pavement limitations, as the 18-ft. pavement has been adopted as standard by the Bureau of Public Roads of the United States Department of Agriculture and applies to all federal aid projects.

This is true also of lengths of buses. A bus that requires the entire width of the street intersection in order to turn the corner not only violates every principle of traffic safety but antagonizes motorists who are held up and must get out of the way for that operation.

The Motor Vehicle Manufacturers Association and your association during the past year, through the work of representative committees, have agreed on all fundamental principles of law that should control motor bus operation. It is no longer open to argument that bus operations should be regulated as public utilities by state commissions in the same manner that electric railways are now regulated. We may still have some differences of opinion on such questions as the method of taxing

*Abstract of a paper presented at the Midyear Meeting of the American Electric Railway Association, Washington, D. C., Feb. 16, 1925.

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the motor vehicle; but the present day extensive operation of buses by electric railways makes it essential that our attitude toward such questions should be one of co-operation.

The bus says it is overburdened by special taxes. The electric railway makes the same claim. We entirely subscribe to your claim that you should not be burdened with paving charges for two reasons. First, it is an anachronism, and second, the charge is a direct charge on the street car rider—the public. There is only one source from which relief from such charges can come, and that is public opinion.

Co-operation with motor vehicle associations will give you the greatest access to public opinion that there is in this country. Would you not admit that if you could reach every telephone subscriber in the United States that you would have access to an overpowering public opinion? Remarkable as it sounds, there are more motor vehicles in this country than there are telephones. That co-operation is offered you, but it cannot be one-sided. You also must appreciate that taxes levied on motor buses are a direct charge against the bus rider, and therefore our co-operative effort must be directed in reducing special taxes and charges levied on both the motor bus and the electric railway for the benefit of our customers who must bear this charge.

We as bus manufacturers have every desire to co-operate with you in another respect. You are our customers. We desire to sell you buses. Having sold you equipment we will not indirectly enter into competition with you by financing competitors' equipment. We do not believe it good business ethics to finance companies operating in competition with our customers, either through stock ownership or by time sales that are a mere subterfuge. In a competitive business where time sales are common and expected we, of course, are compelled to sell equipment on deferred payment plans. We have adopted a plan limiting both the minimum cash required and the maximum of time granted and we will live up to that plan. I am, of course, speaking for the National Automobile Chamber of Commerce, and I expect from your own experience you appreciate that there are "die-hards" in every association who do not live up to the principles agreed upon by their national organization. The best we can say for them is that with your help we will try to show them the error of their ways.

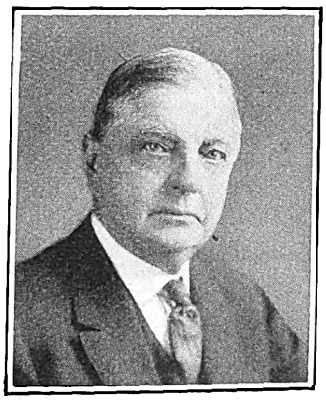
There is one more phase of co-operation that will have an important effect on how buses should be used by electric railways, and that is a national bus association. The American Automobile Association is offering to bus operators throughout the country its facilities as a going users' organization in forming a bus group and affiliating that group with the A. A. A. Independent operators have formed an organization committee to work out a national association of bus operators. Your association has a committee for the purpose of considering some kind of bus group or organization. Three such independent organizations would be fatal to legislative activities and the establishment of policies which the entire automotive industry could support. Haven't we had enough of divided and therefore dissipated efforts? Have we not found in our dealings with each other that when personal misunderstandings have been removed by personal contacts our competitors are, after all, business men with pretty much the same ideas as our own? Are we not big enough, broad enough and have we not had sufficient experience with the national organizations to appreciate that now, before these various organizations are formed, all representing pretty much the same business, that we should bring together the representatives of these three proposed national organizations of bus operators in an attempt to work out a plan for one national association, with fair representation for each type of bus operator that can successfully represent this great business? To accomplish this purpose the National Automobile Chamber of Commerce again offers you its wholehearted co-operation.

Opportunity and Responsibility of the Railway Executive*

By G. E. Hamilton

President Capital Traction Company, Washington, D. C.

The American Association Has Helped in Removing Difficulties in the Past—It Should Be of Even Greater Assistance to the Industry in the Future with Its New Organization Perfected



G. E. HAMILTON

THE electric railway with its allied industries has become one of the prime factors in the business and commercial life of our country. It enters into and carries forward urban and suburban growth and development. It promotes business and social intercourse, it populates towns and links city with city in the chain of commercial progress. It gives comfortable and convenient transportation to all. In it are invested billions of the people's money. It constitutes, in the aggregate, one of the largest purchasing powers in the country. It is, in very truth, a vital artery in the body politic and business life of the nation, and for its preservation and future advancement in usefulness and service it requires, on the part of its executives and executive boards, wise, prudent and honest direction within the law; on the part of the public a fuller understanding and closer co-operation, and on the part of the government, sound legislative policies and regulation that is constructive and not destructive.

This industry has grown to its present status of useful greatness by slow degrees and through difficulties and dangers met and overcome. At one time consisting of unrelated units, small and experimental, scattered over the face of the country, unregulated and operated as private enterprises, lacking often in sufficient capital and inspiring popular prejudice rather than confidence and support, the industry, because of its own mistakes and faults, perhaps, because of popular distrust and of legislative disfavor, was confronted with difficulties and dangers that threatened to destroy it.

At this crucial time, when the clouds were darkest and disaster seemed at hand, the American Electric Railway Association, with a vision broadened and made clear by its long, patient and comprehensive study of street railway management and relations, brought to the companies the counsel and confidence, the initiation and courage needed to meet and overcome the adverse conditions existing, to reorder their broken and faulty lines in policy and direction, and to lay the foundation of successful accomplishment.

Widely separated entities were brought together for conformity in policies, for improvement in operation and for mutual aid and protection through organization.

We have been taught the true meaning and purpose of a public service corporation; a fairer conception of our relations to employees; a fuller recognition of the rights of the people; a realization that reasonable regulation, rightly applied, is strength to the industry. The benefits that have come to us through membership in the association, especially during the last 10 or 15 years, cannot be fully measured or overestimated. It may confidently be expected that this success will be even greater with Mr. Storrs as managing director.

We have grown, and are growing, in the confidence of the people, of regulatory boards and legislative bodies,

*Abstract of an address at the Mid-year Dinner of the American Electric Railway Association, Washington, D. C., Feb. 17, 1925.

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and this growth will continue and increase so long as we continue to recognize the rights of the people; to safeguard our stock and security holders, and to live within the law.

Let us then, knowing our duty and seeing our opportunity, endeavor to meet the responsibilities that come to us; let us sustain and strengthen the guiding hand of the American Electric Railway Association, to the end that we may better serve the people and the interests that are committed to our keeping

Both Buses and Cars Are Needed*

By Guy E. Tripp

Chairman Westinghouse Electric & Manufacturing Company

Maximum Transportation Efficiency Will Be Obtained by Co-ordinating the Two—Buses Should Provide Special Service at a Higher Fare—Trolleys Are Essential for Heavy Traffic

THE kinds of service offered by buses and by trolley cars are quite different. Buses are especially adapted to de luxe service in cities and to serving suburban regions where it does not pay to install trolley systems. Their operating cost is relatively high. On the other hand, nothing has yet appeared which equals the trolley car for serving great numbers of people at a low cost.

Local railway systems, or parts of systems, which furnish high-speed transportation by means of subways or elevated tracks hold, and probably will continue to hold, their places as natural monopolies. This is rapid transit of a character which is not open to competition from any radically different form of transportation and whose financial difficulties are susceptible of cure by the simple means of raising the fare charged. If such lines are not permitted to charge a rate which will support them, it is a form of confiscation, whatever may be their contractual obligations. No one else can operate them any better or cheaper than do the present owners, and if operation is undertaken by the people, the people must pay the deficit themselves.

Nothing can be gained for anybody by seizure under the law, because any loss to present security holders is sure to be included in the higher cost of new money in the future. In other words, so long as the physical properties exist and are a public necessity the public cannot escape from paying for the cost of construction and operation of them quite regardless of who owns certain pieces of paper.

Therefore, while the rapid transit problem is serious, the proper solution of it is simple, viz., a rate of fare which is sufficient to preserve good service. Now I approach more difficult ground. Your industry is confronted with the serious competition of automobile buses and that competition is of a character that cannot be met wholly by the simple remedy of raising fares.

In some localities there is actually a decrease in the number of car riders, and an increase in fare might in some cases accentuate this trouble. Therefore, this new problem of competition is in general a much wider one than the mere rate of fare.

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GUY E. TRIPP

I have called it a new problem of competition, but I would not have you infer that it is an unprecedented one, or that it is the first occasion when a public service, enjoying a natural monopoly, has been confronted with a rival service having quite different characteristics. Some of these rivals have been successful and some have been written off the books. The electric light and power industry threatened to drive the gas business into remote regions, but so far with a conspicuous lack of success. Another, the very recent wireless communication business, has also been a remarkably successful enterprise, but has completely failed to ruin the wire and cable lines. These successful ones, and in fact all successful ones, can only be successful in this day and generation if founded upon fair competition.

You would have an easy and profitable time with the automobile bus competition if it were unfair competition, because the law provides for treble damages in such cases. But is it unfair competition? It is obvious that unfair competition cannot be defined by metes and bounds which can be applied to all cases, but the principles have been laid down by Professor Stevens of Columbia University and the publication of his treatise while the Federal Trade Commission act was under discussion in Congress undoubtedly had a profound influence upon the legislation. He lays down the following standard:

> Fair competition in an economic sense signifies a competition of *economic or productive efficiency*. On economic grounds an organization is entitled to remain in business so long and only so long as its production and selling costs enable it to hold its own in a free and open market. . . . Unfortunately, competition is not always conducted under such conditions of equal opportunity in a free and open market. Productive and selling efficiency alone do not always permit an organization to survive owing to the introduction of methods and practice which destroy the freedom of the market, which hamper the production or selling efficiency of other units and which prevent efficient potential rivals from becoming actual rivals. Such artificial restrictions are clearly unfair, since they hinder or prevent other organizations from competing to the extent *which their productive and selling efficiency may warrant.* If there be a sound basis for competition it lies in the preservation of the economically efficient and the destruction of the inefficient. *It follows that methods which destroy the efficient along with the inefficient are economically unjustifiable and must be regarded as unfair.* . . . In many cases unfairness can not be determined except with reference to the consequence of a given act. The definition of unfair competition therefore should be general in terms. *Any act or method of competition which hampers, injures or destroys concerns which could compete on the basis of their productive and selling efficiency should be forbidden, as should also any method except productive and selling efficiency which prevents potential competitors from becoming actual competitors.*

Measured by these principles, it appears probable that you are not being attacked by unfair competition; and if this be so, then you are reduced to the process of painstaking comparisons between services rendered if you are to form judgment as to whether this new form of transportation will supplant or supplement the street railway or will itself pass into the shadows of unsuccessful business ventures.

The buses claim, among other things, greater comfort, high speed and public preference for their vehicles. Comfort is becoming a greater and greater factor in our daily lives. Steam heat and electric lights are by no means indispensable, but comfort demands them as it does a thousand other things, and if the bus ministers to the public good cheer, its adoption will be limited only by other considerations which outweigh the comforts.

What are some of the superior enjoyments offered by the auto bus? First comes the relief from the nervous strain of being compelled to board and alight from a vehicle standing in the middle of the street—a feat which only a very few years ago could be lightly attempted by any one in possession of his five senses, but which today in all our large cities has become an adventure to all those who have not become hardened to it by constant exposure. Add to this the disagreeable navigation of the space between the sidewalk and the track in bad weather, and you must conclude that it is more comfortable to have your automobile bus drive up to the curb and invite you to step daintily aboard.

Second, comes the enjoyment of rolling noiselessly along upon pneumatic rubber tires with an occasional toot of

*Abstract of an address at the Midyear Dinner of the American Electric Railway Association, Washington, D. C., Feb. 17, 1925.

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the horn, as compared with the roar of metal against metal and the frequent clanging of the gong.

Third, comes the comfortable assurance that you will get a seat because, when the seats are full, no more passengers are taken on. Of course, you must wait for another bus, but you wait in comparative ease on the sidewalk, which is quite different from frequent round trips to the middle of the street in order to ascertain that there is no standing room in a car.

Yes, there is no denying these comforts, but one can get them all by being wheeled to and from his business in a boardwalk chair, and that introduces the other luxury which the public wants to a degree that ought to cause our ancestors to turn over in their graves. Speed is what we all want. This is the "step on the gas" era.

But the bus also claims speed, and I am bound to say that on well-paved city streets I see no reason to dispute the claim. The car is confined to its track, and when blocked not only must stay where it is but it also stops every car behind it, while the bus can meander around the scenery, making headway all the time. It is obviously more flexible in its operations, and it has been my observation that the gasoline motor is a sufficiently speedy contrivance in itself.

Now about the matter of public preference for the vehicles themselves from the standpoint of design. I am not so sure about that. Some of the buses are very beautiful, but a street car could also be made just as beautiful. You cannot tell about a public preference which is based simply upon style. It may be only a caprice, and we human beings are surprisingly fertile in caprice.

Be that as it may, I have granted about all the claims of the automobile bus, and if the case be closed at this point, we might look forward to a time when the street railway company would wrap its track and equipment in its franchise and put the package away in the garret among the spinning wheels and hair trunks.

However, the uncontested affirmative side of a case does not always present the true picture. This emboldens me to ask the bus a question and request a categorical answer.

"You can doubtless serve some of the people all of the time, and all of the people in some places, but can you serve all the people all the time in all places?"

The answer must be "No," and that opens the way for classification, segregation and other forms of dissection, and the important thing to bear in mind is that the thing to be classified is mass transportation—daily and regular moving of the masses of the people from one or more points to one or more other points. Private automobiles and taxis are not included, they are on the same relative plane as the officers' mess in the army, an organization of almost private household simplicity, while mass transportation may be compared to the quartermaster's vast organization, with rigid discipline controlled by inexorable rules and regulations, all of which are necessary if a great army is to be fed at all.

Broadly speaking, the bus gives either a special or a de luxe service which will cost more to operate than the street car and must, therefore, in the long run, charge a higher fare. There will be no difficulty in securing a widespread belief in this statement in view of the astounding fact that every seventh person in the United States owns an automobile. Nevertheless, there will be a demand for this service because the increasing average incomes of the people permit more and more luxuries, and perhaps the principal limitations to the growth of this particular service will be the fixed capacity of the streets and lack of capacity of the bus to handle "rush-hour traffic."

But when the bus has completely occupied its field, there will still remain millions of people to whom a low rate of fare is a necessity, millions who must be served at those most important hours of the day—the rush hours—and nothing has yet appeared to perform this service except the electric car.

Therefore, it seems clear that the people will demand or need both classes of service. There is nothing unique in that. You may today go to New York in a perfectly comfortable day coach, or by paying more you may ride in a parlor car with the luxury of a Nabob.

Such differentiations are easily dealt with when the whole service is rendered by one company, and that is the solution of the traction difficulty which I have been discussing. The whole transportation service in a locality should be centered in one organization, which can increase or diminish each class of service according to necessity, and should one class temporarily run into the red ink of adversity, its more prosperous partner may be able to support it through to better days.

Hereafter it should be the established policy of our cities and towns that no bus franchise will be granted to any one unless it is an integral part of a comprehensive plan for rendering a complete transportation service to the people, and that can only be successfully done by one transportation company.

When that policy shall have been adopted by the municipalities and when all the street railway companies recognize, as many of them now do, that the problem of furnishing mass transportation to the public is one which it is their duty to solve by the use of any method which the progress of the times and development of the art may demand, then there will be inaugurated a new era in urban transportation, which will make it a profitable business, but, aside from that, beyond the mere profits in dollars and cents there will be the satisfaction to you of being engaged in a work which is vital to the civic development of the future.

Transportation Men Should Run Transportation Systems*

By Matthew C. Brush

President American International Corporation

The Same Fighting Spirit and Determination to Succeed that Are Used to Combat Storms and Mishaps Should Be Directed to Securing a Square Deal for the Electric Railways

I REALLY am on the outside looking in at your wonderful industry, your marvelous accomplishments, the tremendous value of your business to the country and your earnestness of purpose. I cannot help but feel that you yourself at times do not fully capitalize your position. Your industry is only 37 years old, a mere child. I don't admit yet that I am old, and I remember very well indeed in 1889 on Fourth Avenue in Minneapolis when the first electric railway was constructed. I was a kid, but you must realize that this industry has been completely built up within that period. There are many men in this room tonight who have been actively engaged in its creation from the day of its birth.

You went through the toughest, most discouraging, crude, vicious, trying and heart-breaking experiences of any great industry. Times that tried men's souls. You fought, worked, wept, laughed, pulled, pushed, argued and explained, and did all of those things that apparently are so necessary to accomplish anything that is worth while.

In your pioneering engineering period you showed a marvelous determination to win against terrific odds—some physical, some financial and some political. You thereby necessarily developed a class of help—men who did things; men who became rugged, mentally and physically, men who are fearless because they are honest and who are working in a high and worthy cause to produce beneficial results for mankind, men who know their business and should be justifiably proud of their accomplishments.

Your industry has very properly been lifted out of the position of a football for politics. There were times not long ago when most public utilities were the victims of political expediency and those concerned in their operation and service suffered accordingly. The situation has shown substantial improvement in this regard, but there is still much to be done.

Now the message I want to leave with you is this: Stand up on your

*Abstract of an address at the Mid-year Dinner of the American Electric Railway Association, Washington, D. C., Feb. 17, 1925.

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hind legs and throw your chest out and realize and capitalize and carry into your every effort the heritage that is yours by being the creators of the electric railway industry of this country. You have had so many wallops, many of you, that you are inclined to duck when some uninformed or unkindly individual or group takes a crack at you. Don't do it. Your whole endeavor is honorably and efficiently to discharge your multitude of responsibilities, and when you are sure you are right stand up and don't be afraid to assert the justice and the merit of your position. You not only have the right but the duty to carry your responsibilities with your head up.

You are the trustees for the employment of more than 300,000 men, receiving approximately $500,000,000 yearly. You are the custodian for practically $6,000,000,000 worth of the people's money. A million and a half people have $6,000,000,000 in your business!

And you also are equally the consumer of approximately $150,000,000 worth of manufactured material, and in that respect you are responsible for the employment of those additional men. You called upon the investors last year for about $300,000,000 for additions, betterments and improvements. You carried approximately 16,000,000,000 people. Now, therefore, you have an army of millions of citizens represented by investors, employees, direct and indirect, by passengers, property owners, and so forth, all of whom are entitled to a square deal not only at your hands but at the hands of those who make the laws and regulations governing your work.

You are directing an essential industry, a public utility that is strictly dependent for its necessary authority to live upon legislative authority, subject to millions of laws, regulations and restrictions, by billions of men, municipal, state and federal, elected and appointed. You are subject to the strictest subserviency of legislative and congressional action, and the advocacy of fair, intelligent, constructive regulatory action cannot be too strongly emphasized. Our form of government, however, is a representative government, those holding governmental power being selected by those governed, and 16,000,000,000 people last year rode on our cars, and they are part of the people that are being governed, and 300,000 men worked for you, and they are part of the people that are being governed.

With such a large percentage of those being governed vitally concerned in just and fair treatment of your industry, are you not negligent and betrayers of your trusteeship if you fail properly, legitimately, intelligently, forcefully to make every effort to select for high places those who by training and ability are qualified to pass upon the problems with which you are constantly confronted and then keep them thoroughly and constantly informed? This tremendous power should function through some well-organized, highly efficient, intelligent, simple organization whereby each of your companies can benefit by the experience of all the rest. I confirm the previous speakers in saying that I know of no man in your industry better qualified to carry out the spirit of what he is undertaking than our good friend "Lu" Storrs.

There are men in this room who were in the horse car business, and when the electric car came along they became electric railway men. Practically every electric railway man in the beginning of your industry, in 1888, '89 and '90, was previously a horse car man. As time went on, the necessity of transportation in your communities developed subways and elevated lines, and the same men who had been in surface car work became

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MATTHEW C. BRUSH

subway and elevated men. No one could possibly have anticipated in the early days of the street car the development that has occurred in subway and elevated transportation in the last 5 or 10 or 15 years.

Now I would like to have you all change your name. I don't like to hear you called street railway men or electric railway men. I like to hear you called transportation men. You have been trained in it, practically all of us here have been in the transportation business directly or indirectly since we were pretty young boys. It is perfectly ridiculous, it is criminal to you, to your heritage and to the community, for men who have had such training as you have had in the handling of men in the transportation business, in the handling of the public, in dealing with commissions, in dealing with the finances of a transportation proposition, to step aside and be superseded by 100 per cent novices, because the particular thing which they run happens to be run by a gallon of gas instead of a few kilowatts.

If there is to be in the community in which you now operate electric railways, under the ground, on the ground, or overhead, any means of transportation which the community justly demands and requires, then you are the men to run it and not some taxicab driver.

I don't think you have any right—and I say you because you are a part of the body of citizens who select the men who make the laws and regulations under which you work—you haven't any right to take my investment as a stockholder in an industry that I have made sincerely and that has been put into a steel rail or into a car, under the supervision of a publicly appointed body, a commission, at a price specified by the commission, and tell me that because the community demands a wheelbarrow or an airplane I am to lose my money and go out of business and Heinie Kabibble or John Jones is to come in with his vehicle and take my business. I have never found in my experience a commissioner, a superintendent of streets, a Congressman or any publicity appointed or elected man who could stand up and face a genuine, honest-to-God meritorious truth if you will pass it to him, but if you don't pass it to him, you have no kick coming as to what they do to your property.

And I have always found in my limited experience that I never got anywhere with a commission or with a legislator or with anybody before whom I appeared who had the power of regulation of the situation with which I was responsible for unless I kept my 52 cards face up on the table and fought like hell to get a square deal.

There is no reason on earth that you shouldn't do it. You are entitled to it, and it is yours. If by some superhuman means you could put in it your determination to use all the power you have, legitimate power, to secure, first, in offices elective and appointed, the type of man that sits over in the White House, and, secondly, would then fight for the square deal to which you are entitled for your investor, who is your neighbor, and for your employee, who is dependent upon you for his livelihood, and for your passenger, who is entitled to decent and good transportation, with the spirit that most men in this room have fought a snowstorm or wreck, you would raise the percentage of successful companies in this country 50 per cent inside of a month.

There isn't a man here who has been in the electric railway game who hasn't crawled under a motor, crawled under a car, put a car back on the rails, who hasn't fought a strike, who hasn't carried a gun, who hasn't sat up 36 hours fighting a snowstorm, who hasn't been through the hell that goes with this industry. Fortunately you have a breed of pups in the industry that fight for something else besides money or you wouldn't have them, but that tremendous determination to succeed, that pride of accomplishment which makes you run the street railways and carry 16,000,000,000 people in this country is the type of guts that I want you to put into your scrap to get a square deal, to see that you get a square deal from those that tell you what you have got to do.

I pray and genuinely and sincerely beg you to stand up and throw out your chest. If you are crooks you don't belong in the business, and if you are on the square you are entitled to a square deal. And I will give you my word from my own personal experience you will get it, but you will never get it if you duck every time somebody takes a crack at you. If you are right, fight your heads off for it; you are entitled to it, you can get it, and with a close, viciously well-knit together, clean, magnificent team, headed by a corking, thoroughly well-informed, courageous, honest, fearless captain there is no reason why every single electric railway in the United States shouldn't be on the basis of a government bond investment.

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Many Committees Meet at Washington

American, Engineering, Claims and T. & T. Executive Committees Head List of 18 Sessions Held in Connection with Midyear Meeting— Much Important Business Transacted

THE Midyear Meeting at Washington was the occasion for sessions of many of the American Association committees and several from the affiliated associations. In all some 18 meetings were held, including the executive committees of the American, Engineering, Claims and Transportation & Traffic Associations. The new management and operation committee, combining the work of last year's city operation and interurban operation committees, held its first meeting. Detailed reports of many of the sessions are given below.

American Executive Committee

A REGULAR meeting of the executive committee of the American Association was held at the Chamber of Commerce Building, Washington, on Feb. 16. Members present were President J. N. Shannahan, chairman; J. W. Welsh, executive secretary; F. R. Coates, L. S. Storrs, W. H. Sawyer, H. D. Briggs, T. C. Cherry, L. H. Palmer, J. H. Hanna, E. F. Wickwire, C. S. Hawley, Harry Reid, C. E. Morgan, E. P. Waller, B. A. Hegeman, Jr., C. D. Emmons, C. L. Henry and E. C. Faber representing Barron Collier.

F. R. Coates, chairman of the policy committee, recommended that the association co-operate with various utility associations through the committee on education in the preparation of instructional matter regarding the utility industry.

It was recommended that Secretary Welsh write a letter to each manufacturer member calling attention to the basis on which dues are assessed, since some members are not entirely clear on the subject. The recommendation was approved.

For the national relations committee Harry Reid called attention to a meeting to be held the same afternoon at which the question of regulation of buses in interstate service was to be discussed. The committee hopes to cooperate with the steam railroads and the motor vehicle industry in studying the subject for the purpose of bringing the regulation of buses under the Interstate Commerce Commission.

Mr. Emmons, for the publication committee, gave a résumé of the status of *Aera*. The magazine is making satisfactory progress. A ballot was taken among member companies as to the size of page desired. Out of 147 replies only 58 desired a change, so it was voted to retain the present page size.

Myles Lambert suggested that the publication committee give some attention to the preparation of articles of a popular type such as would appeal to non-technical readers.

For the committee on company and associate membership Mr. Palmer reported that four manufacturers had applied for membership, the Fisk Tire Company, Chicopee Falls, Mass.; the United States Tire Company, New York City; the Lee Tire & Rubber Company of New York, New York City; the Pressed Steel Car Company, Pittsburgh, Pa. The applications were approved.

The individual membership has increased 11, according to Chairman Morgan, being 831 at the present time. His committee proposed that membership cards be issued to individual members. This was approved.

Motor Bus Policy Discussed

A statement of the policy of the association with regard to motor buses, which was worked out in conjunction with the motor vehicle industry, was read by Mr. Storrs. This was a corollary to a similar statement of policy of the automotive industry with respect to the bus, in which the association concurred in every respect. The resolutions adopted by the American Association are published in full elsewhere in this issue.

Considerable discussion followed the presentation of Mr. Storrs' report. It was felt that the resolutions provide that the industry should be protected against unfair competition, and the association is taking a real step forward. The resolutions represent the best thought of leading electric railway and bus men. Following the discussion the code of principles was adopted as read.

Newly Formed Advisory Council Appoints Managing Director

President Shannahan announced that the advisory council appointed at the last meeting of the executive committee met on Feb. 3. B. C. Cobb, chairman of the advisory council, reported that at that meeting arrangements had been made for the appointment of a managing director of the American Electric Railway Association. In view of the serious problems that confront the railway industry, the advisory council, representing in the main the owners, had given the matter much thought, and had decided that the work of the association could be furthered very much by this move. Mr. Cobb announced that Lucius S. Storrs, president of the Connecticut Company, had been selected for the position of managing director. Inasmuch as he will need the strongest financial support that can be given, members of the advisory council had signed an agreement to underwrite the cost of the new office. This cost, he said, eventually should be distributed over the entire industry, but the underwriting of the movement guaranteed that it could be carried forward. By taking this step, the advisory council feels that the transportation industry can be put where it belongs in the affairs of the nation.

President Shannahan said that it would be necessary to get the association to adopt changes in the constitution. As such changes require a publication of 30 days in advance of action, it was considered necessary to handle the situation temporarily through the executive committee and later put the entire matter before the membership with a vote to be taken at the October convention. The annual surplus existing in the association's finances for the last few years has been taken up by the absorption of the publicity work formerly carried on under the direction of the Committee of 100, and by the growth in the association work, one indication being the change to larger quarters for the New York offices. The new movement will have to be an entirely separate proposition. He felt that each electric railway, large or small, will be so benefited that it should be glad to contribute a proportional amount of the expense.

In the advisory council, said Mr. Shannahan, are men who have not been actively associated with the American Electric Railway Association, but they have come out strongly in favor of the movement. Owen D. Young, for instance, said that there is hard work ahead, and unless everybody stands back of it the movement will not be effective.

Mr. Sawyer moved that in accordance with the recommendations of the advisory council, and until suitable changes can be made in the constitution of the association, the position of managing director be created. The motion was adopted unanimously.

Mr. Storrs Elected

Upon motion of Mr. Morgan, Mr. Storrs was elected to the position by a rising vote of the association.

Mr. Sawyer congratulated the executive committee on taking this step and Mr. Shannahan for initiating and carrying the movement to a successful conclusion, stating that it is the most outstanding progressive and constructive work that the association has done.

Mr. Storrs replied briefly, expressing his thanks and stating that it would be necessary for him to get the duties of the new office outlined before it would be possible to make any definite statement of the policy to be adopted.

Mr. Cobb stated that he expects the

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manufacturers to do some of the underwriting of this new move. Several of the leading manufacturers have already agreed to make substantial contributions, and it is known that others will follow.

ATLANTIC CITY AGAIN CHOSEN FOR CONVENTION

Mr. Sawyer, chairman of the committee on convention location, requested Mr. Morgan, chairman of the subcommittee, to present his report. Mr. Morgan stated that after investigating several cities which had been proposed for the next convention, Atlantic City had been agreed upon by the committee. The terms will be practically the same as those of last year, except that additional facilities will be provided to make possible the exhibit of electric railway cars on the pier, or adjacent thereto. Mr. Sawyer moved that an exhibit be held in connection with the convention and that Atlantic City be chosen as the location of the meeting and that it be held the week beginning Oct. 5. The motion was adopted.

Mr. Hanna extended the greetings of the city of Washington to the association on the event of the Midyear Meeting.

As chairman of the special committee on referendum 44 of the United States Chamber of Commerce, Mr. Hanna made a report covering postal rates, postal salaries, and the possibility of providing an emergency fund for the Postmaster-General.

President Shannahan read a letter from the Electric Truck Transportation Corporation dealing with the matter of store-door delivery in connection with electric railway service. Mr. Reid stated that the same matter had been brought to the attention of the Central Electric Railway Association. Mr. Morgan said that it also had been taken up with the New York State Electric Railway Association. After some discussion, Mr. Reid moved that the Transportation & Traffic Association be authorized to make a study of the subject. The motion was carried.

Secretary Welsh stated that the Department of Commerce wants figures of monthly traffic of electric railways in connection with its survey of current business. This was desired in the form of an index figure of all companies that can be included in such a survey. On motion of Mr. Lambert, it was decided to instruct Mr. Welsh to prepare such information as was needed for the Department of Commerce.

Mr. Henry made a report on the action of the Interstate Commerce Commission in the Lackawanna case, in which section 15A of the interstate commerce act was involved. Under the decision this company was brought under the clause. He suggested that all electric railways study the decision.

President Shannahan announced the membership of the exhibit committee, with C. E. Morgan as chairman, and the entertainment committee, with S. J. Cotsworth as chairman. The complete personnel of these committees will be announced later.

It was decided to hold the next meeting in New York City on April 3, beginning at 10 a.m.

Special Taxes

A MEETING of the committee on special taxes of the American Association was held at Washington, D. C., on Feb. 16. W. H. Maltbie of Baltimore acted as chairman. Others in attendance were: A. C. Watt, A. G. Neil, A. W. Flor and F. W. Doolittle representing Edwin Gruhl. Mr. Maltbie reviewed the previous work of the committee, after which methods were considered of bringing the electric railway tax situation to the attention of the industry as a whole and the public at large.

Location of Next Convention

THE committee on place and date of the next convention met in Washington on Feb. 16 and decided to recommend to the executive committee that the annual convention be held in Atlantic City during the week of Oct. 5. The committee had canvassed the situation in several other cities and concluded that the greatly increased facilities which will be provided for exhibiting electric railway cars this year at Atlantic City made it practicable and desirable to hold the convention there again. The details as to these added facilities will be announced later but they have been definitely provided for, and the committee therefore urged that railway companies and car builders lay plans for an extensive railway car exhibit in October.

Co-operation with Manufacturers

A MEETING of the American Association committee on co-operation with manufacturers was held in Washington on Feb. 16. The members present were E. F. Wickwire, chairman; G. A. Barnes, C. L. Hancock for W. D. Blatz, W. H. Boyce, David Cameron, E. C. Faber, E. E. Kretschner, H. H. Lloyd, Herbert Metz, J. C. McQuiston, George R. Rowland, C. N. Uhl, and C. L. Van Auken.

It was suggested by Mr. Lloyd that the committee on purchases and stores be enlarged to admit purchasing agents of manufacturer members. This suggestion was made because of the similar character of problems of purchasing of railway companies and manufacturing companies. It was thought that this would also make possible closer co-operation with the publicity work of this committee.

There was some discussion of changes in the form of stickers used for shipments made by manufacturer members. These stickers recently have been supplied in quantity to manufacturers by the publicity committee. Another subject along the same line was the discussion of signs to be placed on carload shipments.

Another suggestion was that stuffers be prepared for packages going into the home from manufacturers. This would include such merchandise as electrical goods and similar equipment manufactured for household use.

A suggestion was made which it was considered would be of considerable benefit. This was that letters be written by manufacturer members to realtors, merchants and others in their cities calling attention to their dependence for prosperity on the type of transit available and the prosperity of the electric railway industry. The absolute necessity of protecting the electric railway companies so that they would be able to give the necessary type of service should also be pointed out.

National Relations

THE committee on national relations of the American Association met in its office in the Munsey Building in Washington, Feb. 16. Chairman Harry Reid presided. Members present were: H. G. Bradlee, C. D. Cass, F. C. Hamilton, C. L. Henry, W. V. Hill representing Frank Karr and H. A. Mitchell, D. W. Snyder, Jr., and A. F. Van Deinse.

Some discussion of the various amendments to the Federal law relating to the inspection of steam locomotive boilers led to the appointment of a sub-committee to handle the interests of electric railways in taking up this subject with the Interstate Commerce Commission.

It also was decided to send a copy of the examiners' report in the Lackawanna case before the I.C.C. under Section 15-A of the transportation act to each member for his information and study.

Selling Transportation

AT A meeting in Washington on Feb. 16 the committee decided to draw up no conclusions, but to have the members in the near future submit in writing their individual views as to the more practical steps that can be taken to make railway service more attractive to the public. The committee is hopeful that from these reports enough material can be taken to compile a pamphlet which can be placed in the hands of all engaged in the conduct of electric railway operations.

Bankers are requiring evidence from railways of merchandising enterprise just as they require it from their borrowers engaged in mercantile pursuits, it was said. They are not going to be impressed with efforts that get no further than signs on the exterior of cars or such publicity as can be secured gratis in local newspapers. Signs on the outside of cars are all right as one means of getting business, but they should not be on rough-looking boards. General appearances should be kept up to the highest point possible even where atrocious looking fenders are required.

ATTRACTIVE VEHICLES ATTRACT PATRONS

Varnish and the upholstery play no small part in attractive business to the bus. Cars should be kept well painted. It was suggested that the color might be changed each time the exterior is repainted. Interiors should be made more ornate. More stress should be placed on cleanliness. Noise should be reduced. Manufacturers of cars should be encouraged to do more research in the effort to produce a vehicle as nearly noiseless as possible.

The 1910 street car is no more attractive than is the 1910 automobile. Records show that new equipment increases receipts. While all cars cannot

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be of the 1925 model, 1925 service ideals can be applied generally.

The privately owned automobile is the principal competitor of the electric railway. Means must be devised to prevent further losses of traffic to the private automobile and to get back as much as possible of that already lost. Some of the larger properties may believe that congestion is solving this problem, but means are being found to relieve congestion and progress in that direction may be expected to become more marked. Convenient routing, greater frequency of service, greater average speed, plus the great advantage of lower cost, all will tend to accomplish this end. The bus can be used to great advantage in attaining these objectives. That vehicle should not be regarded as a feeder only. It offers an opportunity to furnish a different class of service, supplementing that furnished on the rails. It offers new possibilities in de luxe and express services. The bus is a new baby in the transportation family. It is just as sure to stay in the family as is the human infant.

The public is getting the idea that the electric railway is doomed. This is making financing more difficult. The fallacy of this conclusion should be offset by educational efforts. Electric railways now must go out after business, and this is calling for greater managerial ability as well as for specialists in merchandising. Higher salaries must be paid so as to attract the best executive talent.

The committee decided not to devote time at the meeting to the discussion of freight and express services as these subjects were dealt with quite fully last year.

In the absence of Chairman Wood, G. H. Clifford of Fort Worth presided. Other members in attendance were: J. A. Dewhurst, C. A. Graves, H. Etheridge, J. P. Griffin, C. D. Smith, E. S. Wilde and W. H. Boyce.

Company Membership

THE committee on company and associate membership met in Washington on Feb. 16 with chairman L. H. Palmer presiding. Other members present were: F. G. Buffe, J. H. McClure, W. J. Harvie, F. C. J. Dell, W. K. Archbold, J. W. Hancock, J. H. Drew and Harry L. Brown. The list of non-member railways was gone over. Each one considered a prospect was assigned to a member of the committee for attention.

Insurance

THE committee on insurance of the American Association developed its program for the year at a meeting at Washington on Feb. 16. Paul Wilson of Cleveland, chairman of the committee, presided. Members in attendance were O. H. Bernd, C. H. Bourne, F. J. Petura and B. L. Tomes.

It was decided to have two sub-committees. The first, under the chairmanship of Mr. Daniels, will consider the general subject of fire insurance, i.e., what the principal hazards are on electric railway properties, the principal available precautions in connection with them and the effect of "good housekeeping" in connection with electric railway risks.

The second sub-committee, under the chairmanship of Mr. Bernd, will study the present status of the industry as regards fire insurance, and will collect data in regard to losses and what is actually being done to prevent fires. These committees will report before the next general meeting of the committee, to be held probably in June.

Management and Operation

THE first meeting of the newly organized committee on management and operation of the American Electric Railway Association was held at Washington on Feb. 16. Those present were F. R. Coates, chairman; R. F. Carbutt, vice-chairman; G. C. Hecker, secretary; E. S. Wilde, H. L. Mitchell, C. D. Porter, R. W. Emerson, G. W. Welsh, and D. E. Blair, regional directors; C. A. Graves, A. J. Stratton, D. J. Locke, H. B. Potter, G. M. Alexander, B. C. Edgar, J. P. Ingle, J. B. Stewart, Jr., R. J. Lockwood, J. M. Bosenbury representing D. W. Snyder, Jr., D. L. Fennell, J. P. Griffin and W. V. Hill, members; J. N. Shannahan, L. S. Storrs, C. D. Emmons, J. W. Welsh, J. W. Colton and Morris Buck, guests.

After the meeting was called to order by Chairman Coates, he presented Mr. Storrs, the new managing director of the association. Mr. Storrs addressed the meeting briefly, stating that he could not think of anything that can be more constructive from the managerial side—which means also the ownership side—than the work of this committee, with the opportunity it gives for the exchange of ideas.

Executive Secretary Welsh explained how the work of this committee can be tied in with the work being carried on at association headquarters. Mr. Hill felt that personal contact between members of the committee and the properties they visit is necessary to get results that will be beneficial.

President Shannahan Tells Committee of Its Opportunity

Addressing the committee briefly, President Shannahan said that scarcely any of the other committees of the association have the opportunity for effective work that this one has. Originally, he was skeptical of what could be accomplished, but a year's contact has shown him the value of the work that has been done and can be done. The greatest benefit, he believes, accrues to the men who make the visits to the properties. For the association these men act as liaison officers and provide a means for getting more active support of the association. The benefit, he said, far outweighs the cost in effort and money.

Mr. Emmons said that he wanted members on the committee to take back the message to the presidents of their companies that he is sold on the value of the work. Any possible resentment from managements who might feel that the visits of committeemen are an unwarranted interference should be allayed by the character of the members and the message they carry to the properties.

Chairman Coates said that when he agreed to accept the position on the committee he had done it with a reservation that a vice-chairman be selected who would be able to carry on the work in the same manner as he would do it. He said that the vice-chairman was fully as capable of doing the work as he was, and having had the experience of last year was probably better qualified than himself.

Plan of Organization and Procedure Presented

Mr. Carbutt then took the chair. He presented for the consideration of the committee a tentative plan of organization and procedure, which has been prepared by an advisory board. This board, consisting of Messrs. Carbutt, Blair, Boyce, Emerson, Riddle, G. W. Welsh and Wilde, had held a meeting with the regional directors on Jan. 30, and had given its approval of the organization plan. Mr. Carbutt outlined the contents of the plan and then placed it before the members for open discussion.

Mr. Fennell raised the question of the overlapping of work of this and other committees, stating that the question had come up at the meeting of another committee the same morning. Mr. Carbutt explained that there was no overlapping and that the functions of this committee were entirely separate from those of committees which were making separate investigations, either by questionnaires or by personal contact.

G. W. Welsh stated that in preparing the handbook there will necessarily be some duplication, but any other committee can go out and get the information. The most important change in the organization of the work for this year is the appointment of regional directors, formerly known as regional vice-chairmen. Last year these men had to do all of the work of visiting properties, while this year the plan is to have all of the members active and to have them divide the work of making the visits to properties. He feels that it is impossible to get much information of value by correspondence, so that the personal visits are of greatest importance.

Mr. Mitchell felt that members of the committee should be informed as to whether companies listed for visits are members of the association or not. It was suggested that on page 5 of the "Plan of Organization of Procedure," par. F (a) should be modified to read: "Co-ordination of electric railway and motor bus and truck service for all transportation requirements." Mr. Stewart moved the adoption of the report. This was seconded and carried.

Mr. Emerson said that no arrangement has yet been made for dissemination of the information that is being collected by the committee. Mr. Carbutt explained that arrangements have been made for editing the material at headquarters. The method of publication will be determined later, depending on the amount of material and the time at which it is received. It was pointed out that in obtaining information from

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companies, one important idea was to get a list of available men for a personnel file of individuals available for committee appointments.

It was suggested that meetings of the advisory board be planned for April 25 and July 15. Mr. Emerson suggested that a deadline be established at April 15, when the portion of the reports that are to be considered at the April 25 meeting should be available in New York. Mr. Lockwood felt that this date was too soon for the complete report, but that a part of the work can be ready at that time. Mr. Fennell felt that the date was rather early, but will do all he can.

Mr. Blair proposed that the attempt be made to get a report written by some one in the company visited who is vitally interested in the work under discussion. It was felt by the members that this method is desirable wherever practicable.

Valuation

THE work of the committee on valuation of the American Association since the last convention was reviewed at a meeting at Washington, D. C., on Feb. 16. F. W. Doolittle of New York, chairman, presided. The other members present were: Thomas Conway, Jr., C. W. Gillespie, F. C. Hamilton, W. H. Maltbie, Albert S. Richey and E. Stenger.

The subject that was first discussed was a progress report of the subcommittee on terminology, of which T. E. Francis is chairman. This subcommittee was appointed for "the study of elements of value claimed from time to time by public utility companies, looking toward the preparation of a list of terms with their definitions, which would be suggestive to the members of the American Electric Railway Association who are at any time confronted with the preparation of a valuation case." One purpose of this study was to reduce unnecessary and more or less meaningless terms, for the sake of clarity and definiteness. Another purpose was to list the principal elements of reasonable and fair value which otherwise might be overlooked in a valuation case. The members of this sub-committee, besides Mr. Francis, are J. A. Emery and James Walker.

The valuation committee also considered the possibility of compiling index numbers of electric railway construction costs, and other topics.

Engineering Executive Committee

THE executive committee of the Engineering Association met in Washington on Feb. 16. Those in attendance were: President C. H. Clark, chairman, R. C. Cram, R. H. Dalgleish, F. H. Miller and G. C. Hecker. Considerable time was devoted to a discussion of standardization work and committee procedure. A sub-committee of the executive committee was appointed, consisting of R. C. Cram, chairman; M. B. Rosevear and Charles R. Harte, to study the entire procedure of standardization of the association, including the plan suggested several years ago of a unit method of voting on the adoption of standards.

President Clark reported that the proposal to organize a committee on rail corrugations was approved by the executive committee of the American Association and that the executives of several companies expressed their desire and willingness to appoint representatives on the committee and bear their proportion of the expenses of a trip of inspection of the various properties throughout the country to study rail corrugation.

It was announced that the executive committee had approved by letter ballot the proposal to assign this year to the power transmission and distribution committee the subject of radio interference.

The secretary announced the completion of the draft of the bibliography on heavy electric traction by Professor Warner, and the bill for his services in this connection was approved. The matter of publishing the bibliography will be referred to the committee on heavy electric traction.

Announcement was made of the approval by the executive committee and indorsement by the association of various recommendations of the Division of Simplified Practice, Department of Commerce, among which were sizes and gages of sheet steel, steel lockers, reinforcing bars for concrete work and others. Announcement was made also that the committee on purchases and stores is studying the standard purchasing department forms recommended by the Division of Simplified Practice and that their recommendations would be presented for consideration of the executive committee at a later date. A special committee consisting of H. H. George, chairman; P. V. C. See and W. F. Graves reported favorably on the recommendations of the central lumber standards committee, and the executive committee authorized formal indorsement by the association of those recommendations.

The secretary announced the appointment of various members of the association on committees of the American Engineering Standards Committee, and reported the status of the work of the sectional committee on tubular steel poles, which was organized under the association's sponsorship.

Welded Rail Joints

A FIVE-HOUR meeting of the committee on welded rail joints was held at the Bureau of Standards on Feb. 16, in the morning and afternoon. Various types of testing apparatus for use on railway track were examined by the members. At the time of the meeting the repeated impact testing machine was out of service on account of failure of one of the mechanical parts.

Co-operative study with the General Electric Company in the matter of otheograph tests was described by E. M. T. Ryder. No great progress has yet been made, but arrangements are under way looking to joint study with the track committee of the American Railway Engineering Association. It is hoped to develop information as to stresses caused by the passage of a car over a defective joint.

It is hoped also that valuable data on stresses in rails and across joints will be developed by means of telemeter tests. Apparatus used for this purpose was described in ELECTRIC RAILWAY JOURNAL for Feb. 14. It is expected that the information thus secured will be helpful in guiding the work of the committee.

Progress report No. 3 of the committee will probably be issued late in February and will bring up to date the results of tensile tests, as well as give information on the results being obtained from the repeated impact testing machine. Outlines were given of five separate investigations of features connected with the problem of seam-welded joints.

A newly developed contact pyrometer designed by C. O. Fairchild of the Bureau of Standards was exhibited at the meeting. Its use will assist the study of actual rail temperatures at different stages of the welding process.

A special report was made on a series of tests of seam-welded joints prepared at Baltimore and at Boston. These tests were made for the purpose of studying the effects of preheating and postheating. The report was presented by R. B. Fehr, development engineer Rail Welding & Bonding Company, and will be included as an appendix to Progress Report No. 3.

Those present at the meeting were: E. M. T. Ryder, C. H. Clark, R. H. Dalgleish, A. P. Way, R. C. Cram, H. H. George, H. M. Steward, C. S. Kimball, J O. Handy, R. B. Fehr, A. F. Blaser, C. W. Bolton, R. R. Seward, W. V. Armstrong, J. H. Deppeler, R. C. McCloy, E. W. Carruthers representing the Pennsylvania Railroad, William Spraragen, and G. K. Burgess, chairman. Other representatives of the Bureau of Standards were: H. L. Whittemore, J. R. Randolph, R. S. Johnston, C. O. Fairchild and O. S. Peters.

A sub-committee on examination of broken test specimens met at the Bureau of Standards on the preceding Saturday afternoon and examined all of the test joints which have thus far been subjected to tensile tests in the Emery testing machine. It is the intention to include the report of this special sub-committee in the forthcoming Progress Report No. 3. Those present at this meeting were: S. W. Miller, R. B. Fehr, E. M. T. Ryder, H. F. A. Kleinschmidt, J. H. Deppeler, R. C. Cram, William Spraragen, H. L. Whittemore and R. S. Johnston.

Transportation and Traffic Executive

IN CONNECTION with the Washington meeting, the Transportation & Traffic executive committee held a session on Feb. 16. Those present were Chairman T. C. Cherry, president of the association; G. H. Clifford, J. V. Sullivan, Samuel Riddle, W. H. Boyce, Edward Dana, E. M. Walker, Paul E. Wilson, and E. J. Murphy of the association staff. C. W. Chase was also present representing the accident prevention committee, of which he is chairman. Mr. Boyce pre-

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sented the report of the committee on selling transportation in the absence of Chairman Wood of that committee.

A. H. Ferrandou, chairman of the committee on bus operation, and G. B. Anderson, chairman of the committee on traffic congestion, presented reports.

It was decided to request of the American Association that no committee be permitted to send out questionnaires that overlap the field of work being investigated by the committee on traffic congestion.

President Cherry named a program committee for the annual convention, which consisted of G. H. Clifford, chairman; Samuel Riddle and Joseph V. Sullivan.

Relief of Traffic Congestion

A DESCRIPTION of the plan which the Los Angeles Railway proposes to follow to secure relief in that city was given by G. B. Anderson at a meeting of the committee on relief of traffic congestion of the T. & T. Association held at Washington Feb. 16. He said that a very satisfactory system of traffic regulation had been in force during the holiday season, but that it had been repealed immediately thereafter. Until recently the merchants and the automobile interests have opposed parking restrictions. Lately, however, the former have begun to see that unlimited parking is a handicap to their business. Only the street car riders are unrepresented in discussions of this subject, and it is therefore the duty of the railway to represent their views. In Los Angeles the railway is endeavoring to present to the public the facts concerning traffic congestion, and to create a sentiment favorable to measures of relief.

Conditions differ in various places, in the opinion of W. S. Bell, who said that ordinarily relief cannot be secured if it is thought by the public to be primarily in the interests of the railway. The situation must be allowed to work itself out, he said, which it will do in time. Already pedestrians are becoming much incensed at the disregard shown by automobile drivers. W. E. Thompson agreed to this view and said that it was best to allow civic organizations to take the initiative in matters of traffic regulation.

Relief can best be secured by going directly to the local police in the opinion of E. S. Rider.

J. E. Heberle spoke of the difficulty of securing relief in Washington, due to the fact that the personnel of the Public Utilities Commission and the District Commission is the same, and these men are extremely busy. The necessity of securing Congressional approval also complicates matters. In general, he thought that best results are secured by sitting in with other bodies.

It was decided on motion by D. L. Fennell that the efforts of the various railways to secure relief of congestion be carefully observed, and that the American Electric Railway Association keep the member companies posted concerning the results.

Major R. J. Lockwood. assistant manager United Railways of St. Louis, suggested that the committee study as soon as possible the recommendations of the Hoover conference on highway safety. A motion to this effect made by Mr. Fennell was carried. It was the sense of the committee that in order to avoid duplication the subject of city operation, so far as it applies to traffic congestion, be left to this committee for study. It was further thought that this committee should undertake to furnish full data on the subject of congestion to the publicity committee, to facilitate its work.

It was the sense of the meeting that, in so far as possible, left-hand turns at intersections and in the middle of the block should be prohibited in congested districts.

The next meeting is to be held in St. Louis, some time in April, at the call of the chairman. Those present were: W. S. Bell, W. E. Thompson, D. L. Fennell, E. S. Rider, J. E. Heberle, J. P. Tretton, F. R. Latta, W. H. Maltbie, C. L. VanAuken representing J. A. Grieg and G. B. Anderson, chairman.

Accident Prevention

THE first meeting of the new joint committee on accident prevention of the Transportation & Traffic Association and the Claims Association was held in Washington on Feb. 16. Members representing the T. & T. Association were: C. W. Chase, president Gary Street Railway, chairman; A. B. Miles, J. A. Jarvis and J. B. Stewart, Jr. Those representing the Claims Association were: G. R. Whitmore, Wallace Muir, E. J. Paige, W. H. Hyland, C. W. Giltner, H. E. Cady, R. A. Sears and Samuel Riddle. J. J. Reynolds, J. B. Stewart, Jr., J. S. Kubu and S. G. Herrell were also present.

Wallace Muir opened the meeting in the absence of the joint chairman, C. B. Hardin, and asked Mr. Chase to preside. Mr. Muir explained that the purpose of the formation of the joint committee was to avoid duplication of work by two separate committees, one in each association. He outlined the recommendations adopted by the committees last year as a guide to the new committee in planning its work.

It was decided that the work of collecting accident statistics be continued this year, and a motion was passed authorizing the chairman to appoint a special sub-committee of three members with E. J. Murphy of association headquarters as chairman.

Highway Crossing Safety Discussed

Mr. Muir recommended that a subcommittee be appointed to draft a bill for regulation of automobiles and the improvement of highway and crossing safety, with a view toward getting this uniform bill adopted by the various states throughout the country. It was proposed that the American Electric Railway Association undertake to obtain the approval and support of the National Safety Council for this bill, and that the association and the Safety Council jointly take the subject up with the United States Chamber of Commerce in an endeavor to get that organization to sponsor this bill as its own. It was suggested that an effort be made to get the Chamber of Commerce to send a copy of the bill to the Governor and Attorney-General of each state, urging them to submit the bill to their respective legislatures for adoption as uniform legislation throughout the country.

This suggestion was questioned by R. A. Sears, general claims attorney Boston Elevated Railway, on the ground that the work started by the recent Hoover safety conference had already assumed a much wider significance than could such a movement as that suggested and that a definite set of principles for the formulation of safety regulation legislation had come out of the Hoover conference with the full approval of the many varied interests represented, including the automobile and railroad industries.

A general discussion ensued of the merits of various plans for working out the idea. It was finally decided to delegate Mr. Muir to outline the main features of his plan to the presidents of the Transportation & Traffic Association and the Claims Association, and to request them to discuss this subject with the executive committee of the American Association.

Discussion of the subject of following up trainmen to check the observance of safety rules led to a number of suggestions for improving the results obtained. Mr. Stewart outlined some of the methods used on the Youngstown Municipal Railway for stimulating safety work and said that the results accomplished by the application of the Louisville safety contest plan had been highly successful.

Mr. Sears outlined the plan used by the Boston Elevated Railroad of presenting safety discussion in a new form. He explained the use of a series of pamphlets in which a report of an imaginary meeting between the men, the general manager and the claim department is given in such a manner as to stimulate the interest and imagination of the employee reading the pamphlet.

After an afternoon session a motion was passed instructing the program committee to secure outlines of the work done by eight or nine railway companies which had made outstanding records in accident prevention. These are to be used as the basis for articles to be published and subsequently reprinted in pamphlet form and distributed to the executives of operating companies.

Claims Executive

AT A brief meeting on Monday afternoon the committee expressed its approval of the uniform motor vehicle law suggested by the accident prevention committee. Some time was given to consideration of subjects suggested for discussion at the annual convention, but no definite action was taken. It was decided to hold the next meeting of the committee in New York on April 3. Those present were: S. J. Herrell, G. T. Hellmuth, E. L. Lindemuth, J. S. Kubu, C. B. Proctor, H. E. Fisher, W. H. Hyland, J. J. Reynolds, Wallace Muir, and H. D. Briggs, president of the Claims Association.

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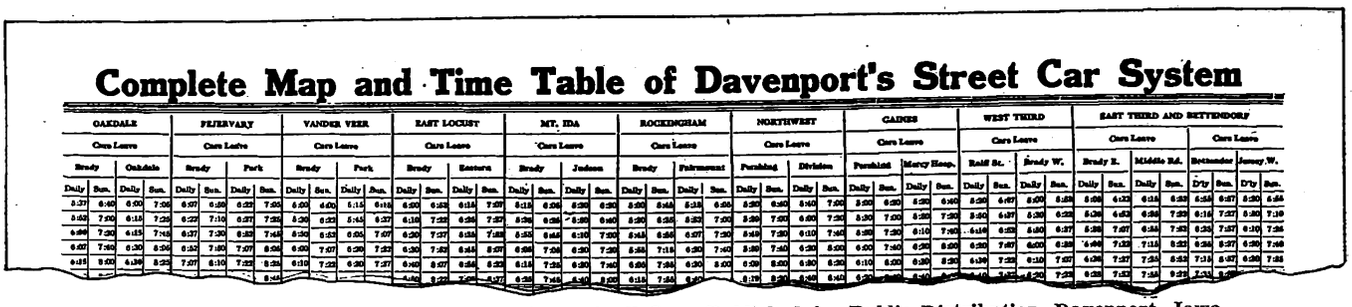
Complete Map and Time Table of Davenport's Street Car System



Upper Part of Time-Table of Running Times of All Cars, Published for Public Distribution, Davenport, Iowa

Complete Time-Table for Public Distribution

FOLLOWING the adoption of a system of rerouting its lines in Davenport, Iowa, some time ago, the Tri-City Railway issued a complete time-table for public distribution. There are altogether seven routes, but as some of them pass through or loop about the center of the city, the time-table shows eleven lines, so as to give the leaving times at the outer terminals and at the center of the city, as at Grady Street or Pershing Avenue. A footnote on the time-table explains that the Oakdale cars, whose leaving times are shown by heavy face type, go only as far as Lombard Street.

The time-table is printed on a sheet 15 in. x 18 in. and also contains a route map of the lines in Davenport and other appropriate information. A reproduction of the upper part of the time-table is published herewith.

Advertising a New Line in Detroit

ON SUNDAY, Nov. 9, 1924, the Department of Street Railways, Detroit, inaugurated service on a new route known as the Mount Elliott line. The total length of this route is 4.35 miles, partly over old track and partly over new. Though mostly double track, a part of the line is single track with turnouts, and the operation of the cars over this section is controlled by automatic signals. Until the traffic warrants larger cars, the service is being furnished by one-man safety cars.

The new route connects eight lines and passes the plant of the Dodge Brothers Motor Car Company, where there are 16,000 employees. To facilitate the problem of receiving and discharging passengers at these works a loop has been built within the Dodge Works, and part of the Mount Elliott line service is routed over this loop. In addition, during the morning and evening peaks a number of tripper cars from several other lines use this loop to take care of motor plant employees.

The Dodge company has co-operated in this traffic improvement by supplying information to its employees in regard to the new service. A copy of one of the posters put up in the Dodge plant is reproduced. A schedule card was also distributed to show from what lines cars would be operated over the loop.

BETTER STREET CAR SERVICE

To improve street car service for Dodge Brothers' employees, the Department of Street Railways has established very fine street car service on Conant Road. This will do away with the crowding on Joseph Campau Ave., and the service has been arranged so it will be easier for you to travel to and from work.

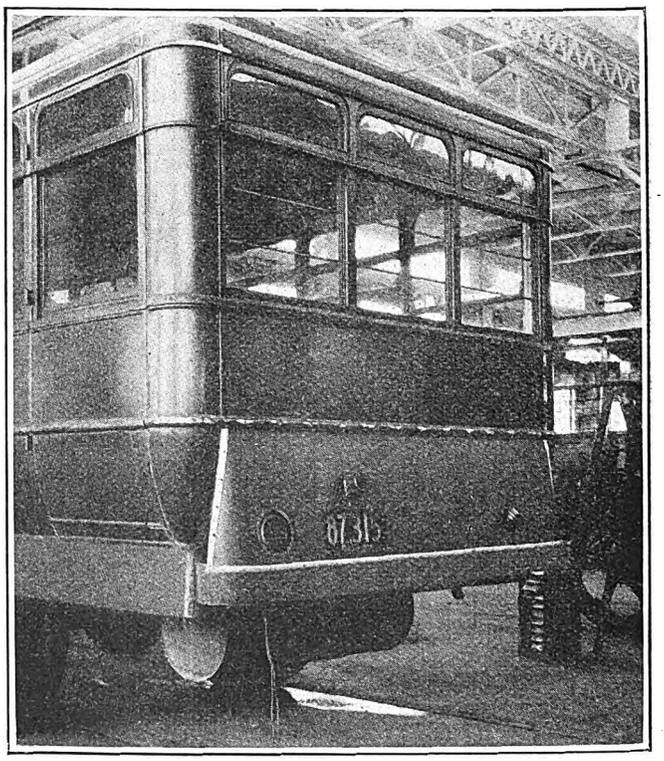
We recommend that you patronize this service at once as we are sure it will work out to your advantage.

DODGE BROTHERS

Manufacturer Advertises a New Car Line

Apron Prevents Riding on Bus Bumper

THE rear of the body on the Mack buses operated by the Boston Elevated Railway is protected from collision with a tree or pole and from damage by another vehicle crashing into the bus by means of a bumper which projects out several inches. It was found, however, that this provided a handy place for urchins to sit when stealing a ride. In order to prevent this a sheet metal apron has been installed in a manner similar to that used on the bumpers of street cars. This has effectually prevented riding on the bumper. In the accompanying illustration the apron has received only a priming coat and therefore appears to be a slightly different color from the rest of the body. After the painting job has been completed, the apron is the same color as the rest of the bus and is inconspicuous.



This Bumper Apron Is Similar in Purpose and Construction to Those Used on Street Cars

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Census Report Shows Status of Electric Railways

Tables and Other Statistics from the Census Report Just Made Public Give Interesting Facts About the Growth in Traffic of the Electric Roads Between 1917 and 1922

PRELIMINARY figures of the status of the electric railway companies of the United States contained in the census report for the year ended June 30, 1922, have been published in this paper.* The complete census report on electric railways has now been made public and has been issued from Washington. The report is printed on a page of more convenient size than previous issues, the page being 6x9 in. instead of 9x11½ in. There are 256 pages in the report. The period covered by the operating statistics is generally the calendar year 1922. The statistics for equipment and balance sheets relate to Dec. 31, 1922, and for number of employees, June 30.

Statistics on electric railways have been compiled by the Census Bureau every five years since 1902. The census is primarily of street and interurban railways,

*See ELECTRIC RAILWAY JOURNAL for Oct. 6, Nov. 3, Nov. 10, Dec. 1, Dec. 22, 1923, and Feb. 9, 1924.

TABLE I—PRINCIPAL STATISTICS: 1922 AND 1917

	1922	1917	Per Cent of Increase[1]
Number of companies	1,200	1,307	—8.2
Operating	858	943	—9.0
Lessor	342	364	—6.0
Miles of single track operated, all tracks[2]	43,931.86	44,835.37	—2.0
Running track	42,450.09	43,364.83	—2.1
Main track	40,364.33	41,446.67	—2.6
Road or first track	31,264.26	32,547.58	—3.9
Second track	8,796.33	8,656.08	1.6
Other main track (third, fourth, etc.)	303.74	243.01	25.0
Sidings and turnouts	2,085.76	1,918.66	8.7
Track in carhouses, storage yards, etc.	1,481.77	1,470.54	0.8
Miles of motor-bus lines (one-way)	685.36	[3]	.....
Rolling stock:			
Cars, number	99,255	102,603	—3.3
Revenue cars	88,707	91,448	—3.0
Passenger	77,301	79,914	—3.3
Express, freight, baggage, and mail	11,406	11,534	—1.1
Service cars	10,548	11,155	—5.4
Electric locomotives	404	357	13.2
Motor buses, number, one-man	370	[3]	.....
Persons employed by operating companies:			
Number	300,523	294,826	1.9
Salaries and wages	$445,680,135	$267,240,362	66.8
Salaried employees—			
Number[4]	30,239	27,151	11.4
Salaries	$57,489,091	$33,909,674	69.5
Wage earners—			
Number	270,284	267,675	1.0
Conductors, motormen, and one-man car and bus operators	130,628	136,184	—4.1
Other wage earners	139,656	131,491	6.2
Wages	$388,191,044	$233,330,688	66.4
Conductors, motormen, and one-man car and bus operators	$205,238,478	$127,222,144	61.3
Other wage earners	$182,952,566	$106,108,544	72.4
Traffic:			
Passengers carried	15,347,519,966	14,506,914,573	5.8
Car lines	15,331,399,851	14,506,914,573	5.7
Motor-bus lines	16,120,115	[3]	.....
Total revenue passengers	12,679,349,042	11,304,660,462	12.2
Car lines	12,666,557,734	11,304,660,462	12.0
Motor-bus lines	12,791,308	[3]	.....
Regular-fare passengers	12,217,523,995	11,304,660,462	8.1
Car lines	12,205,118,008	11,304,660,462	8.0
Motor-bus lines	12,405,987	[3]	.....
Pay-transfer passengers	461,825,047	[5]	.....
Car lines	461,439,726	[5]	.....
Motor-bus lines	385,321	[3]	.....
Free-transfer passengers	2,499,822,382	3,021,137,935	—17.3
Car lines	2,496,570,207	3,021,137,935	—17.4
Motor-bus lines	3,252,175	[3]	.....
Free passengers	168,348,542	181,116,176	—7.0
Car lines	168,271,910	181,116,176	—7.1
Motor-bus lines	76,632	[3]	.....
Car and bus mileage	2,145,398,078	.....	.....
Revenue-car mileage	2,124,523,362	2,139,801,530	—0.7
Passenger	2,068,293,833	2,087,818,534	—0.9
Express, freight and mail	56,229,529	51,982,996	8.2
Non-revenue car mileage	13,758,312	[3]	.....
Bus mileage	7,116,404	[3]	.....
Car and bus hours	203,785,888	.....	.....
Revenue car-hours[6]	201,838,263	203,056,931	—0.6
Passenger	197,146,335	199,052,633	—1.0
Express, freight and mail	4,691,928	4,004,298	17.2
Non revenue car-hours	1,325,573	[3]	.....
Bus-hours	622,052	[3]	.....

Condensed income accounts:	1922	1917	Per Cent of Increase[1]
Operating companies—			
Income from all sources	$1,049,048,321	$730,108,040	43.7
Operating income—			
Railway operating revenues	925,477,485	650,149,806	42.3
Railway operating expenses	678,563,107	421,250,838	61.1
Net revenue—Railway operations	246,914,378	228,898,968	7.9
Auxiliary operations—Revenues	91,241,607	59,675,286	52.9
Auxiliary operations—Expenses	49,232,061	31,343,816	57.1
Net revenue—Auxiliary operations	42,009,546	28,331,470	48.3
Net operating revenue	288,923,924	257,230,438	12.3
Taxes	64,788,315	45,756,695	41.6
Operating income	224,135,609	211,473,743	6.0
Non-operating income	32,329,229	20,282,948	59.4
Gross income	256,464,838	231,756,691	10.7
Deductions from gross income—			
Rent for leased roads (lines and terminals)	43,771,275	48,302,823	—9.4
Interest on funded and unfunded debt	139,126,390	119,113,018	16.8
Miscellaneous	16,379,561	7,889,920	107.6
Total deductions	199,277,226	175,305,761	13.7
Net income	57,187,612	56,450,930	1.3
Dividends	36,729,243	48,337,435	—24.0
Surplus	20,458,369	8,113,495	152.2
Lessor companies—			
Income from all sources	31,855,434	43,216,501	—26.3
Rentals from operating companies	31,103,067	42,759,850	—27.3
Miscellaneous income	752,367	456,651	64.8
Deductions from income	14,837,025	17,897,373	—17.1
Interest on funded debt	13,120,349	16,147,380	—18.7
Taxes and miscellaneous (maintenance and organization, etc.)	1,716,676	1,749,993	—1.9
Net income	17,018,409	25,319,128	—32.8
Dividends	16,933,751	24,925,706	—32.1
Surplus	84,658	393,422	—78.5
Capitalization:			
Total (gross)	5,446,794,547	5,532,223,818	—1.5
Operating companies	4,734,678,330	4,626,788,077	2.3
Lessor companies	712,116,217	905,435,741	—21.4
Capital stock	2,329,173,090	2,473,846,651	—5.8
Operating companies	1,972,832,506	2,006,151,013	—1.7
Lessor companies	356,340,584	467,695,638	—23.8
Funded debt[7]	3,117,621,457	3,058,377,167	1.9
Operating companies	2,761,845,824	2,620,637,064	5.4
Lessor companies	355,775,633	437,740,103	—18.7
Gross capitalization per mile of track owned[8]	126,075	126,021	.....
Net capitalization on account of electric railways (excluding investment securities and non-operating property	4,661,923,873	4,889,962,096	—4.7
Net capitalization per mile of track owned[8]	107,908	111,391	.....

[1] A minus sign (—) denotes decrease; percentage not computed where base is an average or is less than 100.
[2] Includes track laying outside the United States (1922 and 1917, 27.06 miles).
[3] No data.
[4] Numbers employed June 30, 1922, and Sept. 29, 1917.
[5] Not reported separately. Included in regular-fare passengers.
[6] Represents 770 companies for 1922 and 836 for 1917.
[7] Includes real estate mortgages amounting to $13,795,318 for 1922 and $7,197,895 for 1917.
[8] Exclusive of track not represented by capitalization, as follows: 1922, none; 1917, 5.30 miles.

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TABLE II—INCOME AND EXPENSE PER REVENUE PASSENGER[1]: 1912 to 1922

	1922 Cents	1917 Cents	1912 Cents
Income from all sources	8.27	6.46	6.14
Railway operations	7.30	5.75	5.62
Auxiliary operations	0.72	0.53	0.33
Non-operating income	0.25	0.18	0.19
Operating expenses (railway and auxiliary)	5.74	4.00	3.49
Taxes	0.51	0.40	0.37
Interest	1.10	1.20	1.19
Other deductions from income	0.47	0.14	0.18
Net income	0.45	0.72	0.91
Dividends	0.29	0.65	0.74
Surplus	0.16	0.07	0.17

[1] Based on total regular-fare passengers and pay-transfer passengers, car lines and bus lines.

TABLE III—COMPANIES OPERATING OVER 500 MILES OF SINGLE TRACK IN 1922

Name of Company	Miles of Line Operated	Miles of Single Track Operated
Pacific Electric Company, California	631.23	1,114.86
Chicago Surface Lines, Illinois	510.76	1,070.33
The Connecticut Company, Connecticut	601.14	860.59
Public Service Railway Company, New Jersey	496.67	846.62
Eastern Massachusetts Street Railway Company, Massachusetts[1]	532.05	707.44
Philadelphia Rapid Transit Company, Pennsylvania	449.57	695.11
New York State Railways Company, New York	337.33	594.79
Pittsburgh Railways Company, Pennsylvania	329.42	592.26
Boston Elevated Railway, Massachusetts	237.46	509.51

[1] Reported as Bay State Street Railway for 1917.

TABLE IV—TRACK MILEAGE 1922 AND 1917 BY LOCATION AND CHARACTER OF SERVICE

	1922	1917	Per Cent increase
By location:			
Surface	43,004.61	44,119.29	—2.5
Public thoroughfares	25,856.95	26,284.53	—1.6
Private right of way	17,147.66	17,834.76	—3.9
Elevated	601.69	497.29	21.0
Subways and tunnels	325.56	218.79	48.8
By character of service:			
City and suburban	26,123.93	26,737.75	—2.3
Interurban	17,807.93	18,097.62	—1.6

TABLE V—TYPES OF CARS IN 1922, 1917 AND 1912

Kind	Number 1922	Number 1917	Number 1912	Per Cent Distribution 1922	Per Cent Distribution 1917	Per Cent Distribution 1912
Cars—Total	99,255	102,603	94,016	100.0	100.0	100.0
Revenue cars	88,707	91,448	83,956	89.4	89.1	89.3
Passenger	77,301	79,914	76,162	77.9	77.9	81.0
Closed	56,840	50,487	48,123	.....	.....	.....
Open	8,789	15,893	18,993	.....	.....	.....
Convertible or semi-convertible	10,224	12,601	[1]7,985	.....	.....	.....
Combination passenger and baggage, express, freight, or mail	1,448	933	1,061	.....	.....	.....
Special cars (included in passenger cars)—						
Parlor	51	73	149	.....	.....	.....
Sleeping	7	7				
Private	20	36				
Other special[2]	23	23				
Express, freight, and baggage	11,352	11,442	7,794	11.5	11.2	8.3
Mail	54	92				
Service cars:						
Snowplows	1,477	1,642	10,060	10.6	10.9	10.7
Sweepers	1,442	1,275				
Sprinklers	207	278				
Work and other service cars	7,422	7,960				
Cars equipped with electric motors	75,335	76,429	73,758	75.9	74.5	78.5
Cars equipped with gasoline engines	8	19	21	.....	.....	.....
Electric locomotives	404	357	277	.....	.....	.....

[1] Reported as "Combination—closed and open."
[2] 1922, one ambulance car, six dining cars, ten funeral cars, and six cars of a character not stated; 1917, eight funeral cars, six excursion cars, and nine cars of a character not stated.

TABLE VI—DENSITY OF TRAFFIC ON ELECTRIC RAILWAYS, NEW YORK CITY, CHICAGO, PHILADELPHIA, AND BOSTON IN 1922[1]

	Miles of Main Track	Number of Revenue Passengers[1]	Average number of Revenue Passengers Per Mile of Track	Per Car-Mile
New York City:				
Surface	194.41	351,018,849	1,805,560	12.83
Elevated and subway	352.20	1,102,953,327	3,131,611	5.83
Chicago:				
Surface	993.13	762,629,211	767,905	6.57
Elevated and subway[2]	151.52	181,280,754	1,196,415	3.51
Philadelphia[3]	634.68	691,177,642	1,089,018	8.46
Boston[3]	441.31	356,423,418	807,649	7.06

[1] Includes pay-transfer passengers for 1922 as follows: New York, 13,326,466; Chicago, none; Philadelphia, 55,206,600; Boston, none.
[2] Includes a small amount of surface trackage operated as part of elevated systems.
[3] Comprises both elevated and surface trackage.

TABLE VII—REVENUE PASSENGERS AND REVENUE-CAR MILEAGE—PER CENT DISTRIBUTION AND PER CENT OF INCREASE, BY GEOGRAPHIC DIVISIONS: 1922, 1917 AND 1912

Division	Per Cent Distribution 1922	Per Cent Distribution 1917	Per Cent Distribution 1912	Per Cent Increase[1] 1917–1922	Per Cent Increase[1] 1912–1917
Revenue Passengers[2] United States	100.0	100.0	100.0	12.0	18.4
New England	9.0	11.0	11.0	—8.7	18.2
Middle Atlantic	39.3	37.4	36.8	17.8	20.3
East North Central	23.5	24.0	22.6	9.8	25.6
West North Central	7.4	8.0	8.2	4.4	14.6
South Atlantic	6.6	6.6	6.5	11.1	21.2
East South Central	2.4	2.6	2.8	5.5	8.6
West South Central	3.0	2.8	2.8	21.5	15.7
Mountain	1.2	1.4	1.6	—8.3	5.2
Pacific	7.6	6.2	7.6	36.8	—2.2
Passenger Revenue-Car Mileage United States	100.0	100.0	100.0	—0.9	10.7
New England	8.2	9.8	10.0	—16.9	8.8
Middle Atlantic	34.1	33.5	34.9	0.8	6.3
East North Central	25.3	25.2	24.5	—0.3	13.9
West North Central	8.2	8.1	8.0	—0.1	12.8
South Atlantic	7.2	6.6	6.5	7.5	12.8
East South Central	2.8	3.1	3.0	—9.1	10.9
West South Central	3.8	3.7	3.2	2.7	25.2
Mountain	1.5	1.6	1.6	—7.6	9.2
Pacific	8.9	8.4	8.2	4.2	13.3

[1] A minus sign (—) denotes decrease.
[2] Includes pay-transfer passengers; does not include motor-bus passengers.

TABLE VIII—CAPITALIZATION AND FLOATING DEBT, OPERATING AND LESSOR COMPANIES, COMBINED: 1922 AND 1917

	1922	1917	Per Cent Increase[1]
Capital stock	$2,329,173,090	$2,473,846,651	—5.8
Common	1,842,639,433	2,012,189,294	—8.4
Preferred	[2]486,533,657	461,657,357	5.4
Funded debt	3,103,826,139	3,051,179,272	1.7
Real-estate mortgages	13,795,318	7,197,895	91.7
Floating debt	176,734,785	166,592,228	6.1
Total	$5,623,529,332	$5,698,816,046	—1.3
Stocks and bonds of other electric railway companies and treasury securities	446,435,768	390,489,091	14.3
Gross capitalization less stocks and bonds of other electric railway companies and treasury securities	$5,177,093,564	$5,308,326,955	—2.5
Investments in other securities and non-railway properties	338,434,906	251,772,631	34.4
Net capitalization:			
Including floating debt[3]	$4,838,658,658	$5,056,554,324	—4.3
Per mile of track	111,999	115,186	.....
Excluding floating debt[3]	4,661,923,873	4,889,962,096	—4.7
Per mile of track	107,908	111,391	.....

[1] A minus sign (—) denotes decrease.
[2] Includes debenture stock amounting to $3,830,551.
[3] Includes real-estate mortgages.

TABLE IX—FINANCIAL STATISTICS FOR VARIOUS GROUPS OF ROADS

	Surface Railways Without Commercial Lighting 1922	Surface Railways Without Commercial Lighting 1917	Elevated Railways and Subways 1922	Elevated Railways and Subways 1917
Number of companies	722	758	7	7
Ratio of operating expenses to operating revenues (per cent)	72.6	63.8	63.9	46.2
Per mile of track:				
Operating revenues	$22,589	$16,137	$123,392	$102,891
Railway operations	22,489	16,070	120,046	100,231
Auxiliary operations	100	67	3,345	2,660
Operating expenses	16,402	10,297	78,864	47,544
Railway operations	16,355	10,266	77,470	46,560
Auxiliary operations	47	31	1,394	984
Net operating revenue	6,187	5,841	44,528	55,347
Railway operations	6,134	5,804	42,577	53,670
Auxiliary operations	53	37	1,951	1,677
Per car-mile:	Cents	Cents	Cents	Cents
Operating revenues	44.56	30.87	34.90	27.73
Railway operations	44.36	30.74	33.95	27.01
Auxiliary operations	0.20	0.13	0.95	0.72
Operating expenses	32.35	19.70	22.30	12.81
Railway operations	32.26	19.64	21.91	12.55
Auxiliary operations	0.09	0.06	0.39	0.26
Net operating revenue	12.21	11.17	12.59	14.91
Railway operations	12.10	11.10	12.04	14.46
Auxiliary operations	0.10	0.07	0.55	0.45
Per revenue passenger:[1]				
Operating revenues	7.17	5.67	6.07	5.43
Passenger	6.61	5.26	5.56	5.06
All other	0.56	0.41	0.51	0.37
Operating expenses	5.21	3.62	3.88	2.51
Railway operations	5.19	3.61	3.81	2.46
Auxiliary operations	0.02	0.01	0.07	0.05
Net operating revenue	1.96	2.05	2.19	2.92

[1] Revenue passengers comprise regular-fare passengers and pay-transfer passengers on both car and bus lines.

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TABLE X—OPERATING EXPENSES OF OPERATING COMPANIES BY ACCOUNTS: 1922 AND 1917

Account	1922	1917	Per Cent of Increase[1]	Per Cent Distribution in 1922
Number of companies	858	943	—9.0	....
Operating expenses, total	$727,795,168	$452,594,654	60.8	100.0
Railway operating expenses	$678,563,107	$421,250,838	61.1	93.2
Way and structures	102,003,281	55,470,419	83.9	14.0
Equipment	87,236,577	48,981,554	78.1	12.0
Power	107,245,578	76,958,461	39.4	14.7
Conducting transportation	286,684,634	174,972,645	63.8	39.4
Traffic	2,732,173	2,301,817	18.7	0.4
General and miscellaneous	92,940,078	62,738,265	48.1	12.7
Transportation for investment —credit	—284,214	—172,323	64.9	[2]
Auxiliary operations—expenses	49,232,061	31,343,816	57.1	6.8

[1] A minus sign (—) means decrease.
[2] Less than one-tenth of 1 per cent.

and the statistics of electrified steam roads are not included in the general tables. The statistics of the Chicago Tunnel Company are also not included.

The census reports four surface railways still operated by cable, two in California and two in Washington. It also shows three roads still operated with animal traction, though only one, located in Arkansas, with 0.75 mile of track, was operated exclusively by this form of power. The others were one electric railway company in Pennsylvania and one in New York which reported small amounts (totaling 3.27 miles) operated by animal power for the purpose of holding franchises.

The final chapter in the report gives statistics of the sixteen municipally operated electric railways and the one state-operated railway.

For the first time, the Census Bureau collected data in regard to motor bus operation by electric railways, pay-transfer passengers and non-revenue car-mileage and car-hours. The information in regard to motor bus operation related only to those lines which form integral parts of electric railway companies, and did not cover independent bus lines or separate lines operated under stock ownership by railway companies.

For the first time since statistics of street and electric railways have been compiled by the Census Bureau, the mileage shows a decrease. The miles of single track operated in 1922 were 903.5 less than in 1917. This total included 294.14 miles of idle track. There was also a decrease in the number of passenger cars operated, in value of road and equipment and in number of companies. On the other hand, the number of employees increased 1.9 per cent, the number of revenue passengers (including pay-transfers) increased 12.2 per cent, and operating revenue increased 42.3 per cent.

The principal statistics of the electric railways, with the exception of statistics on power plants, are given in Table I. Table II gives the income and expenses in cents for revenue passengers from 1912 to 1922.

The average size of each operating company in 1922 was 51.20 miles of single track, 90 passenger cars and 350 employees, and the average company operated 2,416,231 passenger car-miles during the year and carried 14,797,381 revenue passengers. There were nine companies which operated more than 500 miles of track in 1922, as shown in Table III.

Data on Track and Rolling Stock

All kinds of railways decreased their total length during the half decade from 1917 to 1922 except "elevated railways," and "subways and tunnels." This is shown by Table IV.

Table V shows for the last three census years the different kinds of cars used in electric railway service. Of this number, 75,335 cars were equipped with electric motors, as follows: 298 were equipped with one motor each, 42,811 with two motors, 297 with three motors and 31,929 with four or more motors. Of the 98,042 cars equipped with brakes, 80,936 were equipped with air brakes, 1,190 with other kinds of power brakes, and 15,916 with hand brakes exclusively. Of the 88,432 revenue cars, 16,506 were mounted on single trucks and 17,926 on double trucks.

Power Equipment

The report shows an increase in the number of companies purchasing electrical energy instead of generating it. The proportion to the entire number reporting no power plant equipment was 73 per cent in 1922 as compared with 62.4 per cent in 1917. There was also a decrease in the output of stations operated entirely for electric railway purposes. The total power station capacity for electric railways, central stations and electrified sections and tunnels of steam railroads increased greatly, however, this total being, in rated horsepower 17,425,580 in 1917, and 24,800,732 in 1922.

Statistics on Traffic

In their statistics on electric railway traffic the compilers of the census report point out that some zone fare companies count passengers as the number of persons paying fares in each fare zone, whereas on other lines each passenger is counted but once regardless of the distance he rides. They also declare that some com-

TABLE XI—ANALYSIS OF INCOME PER REVENUE PASSENGER, ALL OPERATING COMPANIES AND COMPANIES OF CLASS X (OR COMPANIES WITHOUT COMMERCIAL LIGHTING) FOR THE UNITED STATES: CLASS X, CITY AND SUBURBAN TRACKAGE ONLY, FOR SELECTED STATES: 1922 AND 1917

Class and State	Number of Companies 1922	Number of Companies 1917	Number of Revenue Passengers 1922	Number of Revenue Passengers 1917	Average per passenger (cents): Income from All Sources 1922	Income from All Sources 1917	Operating Expenses 1922	Operating Expenses 1917	Taxes 1922	Taxes 1917	Deductions from Gross Income 1922	Deductions from Gross Income 1917	Net Income 1922	Net Income 1917
All companies	858	943	12,679,349,042	11,304,660,462	8.27	6.46	5.74	4.00	0.51	0.41	1.57	1.55	0.45	0.50
Class X—All companies without commercial lighting	722	758	11,349,255,972	9,630,773,816	7.40	5.83	5.21	3.62	0.45	0.38	1.43	1.43	0.31	0.40
Companies of class X, operating city and suburban trackage only—selected states:														
California	17	20	354,682,561	215,509,448	5.28	5.02	3.91	3.78	0.31	0.32	0.66	1.10	0.39	[1]0.18
Illinois	28	34	1,072,831,278	989,209,604	7.56	5.23	5.13	2.83	0.45	0.48	1.15	1.21	0.84	0.71
Kansas	4	3	17,083,325	12,337,265	6.07	5.18	4.44	2.90	0.45	0.46	0.65	1.22	0.53	0.60
Kentucky	7	8	107,318,921	99,688,947	6.49	5.25	4.55	3.11	0.47	0.47	0.97	1.17	0.50	0.50
Massachusetts	17	21	640,555,942	522,227,088	8.55	5.21	6.08	3.76	0.37	0.25	1.40	1.01	0.70	0.19
Missouri	12	10	300,350,798	272,283,832	7.03	5.03	5.22	3.44	0.63	0.42	1.03	0.97	0.14	0.20
New Jersey	12	9	445,341,799	397,649,320	6.77	5.10	4.68	3.03	0.65	0.42	1.37	1.46	0.08	0.19
New York	58	59	2,579,743,680	1,943,501,048	5.52	5.45	3.77	3.01	0.32	0.37	1.54	1.63	[1]0.11	0.44
Ohio	19	15	535,125,100	458,780,663	4.81	4.21	3.50	2.91	0.37	0.34	0.26	0.55	0.69	0.41
Pennsylvania	53	60	844,213,378	794,916,862	6.48	5.51	4.38	2.97	0.37	0.27	1.41	1.65	0.32	0.62
Texas	13	18	92,745,119	63,638,242	6.60	5.19	4.84	3.72	0.39	0.31	0.85	1.07	0.52	0.09
Wisconsin	7	9	14,571,611	126,310,087	6.66	4.48	5.57	2.74	0.33	0.29	0.89	0.68	[1]0.14	0.77

[1] Deficit.

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TABLE XII—EMPLOYEES, SALARIES, AND WAGES, BY OCCUPATIONAL CLASSES, FOR OPERATING COMPANIES: 1922 AND 1917

Class	1922	1917	Per Cent of Increase[1]
Number of companies	858	943	—9.0
Persons employed:			
Number	300,523	294,826	1.9
Salaries and wages	$445,680,135	$267,240,362	66.8
Salaried employees—			
Number	30,239	27,151	11.4
Salaries	$57,489,091	$33,909,674	69.5
Officials—			
Number	2,017	1,883	7.1
Salaries	$8,946,893	$6,786,469	31.8
Managers and superintendents—			
Number	3,358	2,889	16.2
Salaries	$10,403,759	$6,205,507	67.7
Clerks, stenographers, and other salaried employees—			
Number	24,864	22,379	11.1
Salaries	$38,138,439	$20,917,698	82.3
Wage earners:			
Number[2]	270,284	267,675	1.0
Wages	$388,191,044	$233,330,688	66.4
Conductors, motormen, one-man car and bus operatives—			
Number	130,628	136,184	—4.1
Wages	$205,238,478	$127,222,144	61.3
Conductors—			
Number	58,988	68,352	—13.7
Wages	$92,939,236	$62,992,587	47.5
Motormen—			
Number	58,166	67,832	—14.2
Wages	$92,953,300	$64,229,557	44.7
Operators, one-man cars—			
Number	13,070	[3]	.....
Wages	$18,797,669	[3]	.....
Operators, buses—			
Number	404	[3]	.....
Wages	$548,273	[3]	.....
All other wage earners—			
Number	139,656	131,491	6.2
Wages	$182,952,566	$106,108,544	72.4

[1] A minus sign (—) denotes decrease.
[2] For 1922 as of date June 30; for 1917, Sept. 29.
[3] Not reported separately.

panies, in compiling their revenue car-mileage, count a motor car and trailer as one car and others count them as two. This should be considered in connection with the accompanying tables, as should also the fact that while all companies reported car-miles, only 89.7 per cent of the companies reported car-hours, although these companies carried 95.2 per cent of the total revenue passengers (not including motor bus passengers). In the tables, also, pay-transfer passengers are included with the regular fare passengers as "revenue passengers," but motor bus passengers are not included in the general statistics.

Table VI shows some figures on density of traffic in four large cities in 1922. This table does not include all of the roads in the city mentioned in each case.

Table VII shows per cent distribution and per cent increase by geographical divisions of revenue passengers and car-miles for the last three census years.

The report gives extensive statistics on the finances of operating and lessor companies. The figures for both classes of companies, combined, for 1917 and 1922, are given in Table VIII, with the net capitalization, after securities owned are deducted, and the net capitalization per mile of track. Of the 1,154 operating and lessor companies, 315 operating companies and 180 lessor companies paid dividends. The average rate was 5.4 per cent for the operating companies and 7 per cent for the lessor companies, or an average of 5.8 per cent on the outstanding capital of those companies which declared dividends.

Table IX shows some interesting averages for 1922 and 1917. In the first group of two columns the railways are those surface railways where the company does not do any commercial lighting, so that the receipts and expenses for auxiliary operations are small. The final two columns related to elevated railways and subways. The census report gives similar figures for roads combining railway with lighting operations.

Table X shows the operating expenses by primary accounts for 1922, with percentage distribution and per cent increase over 1917. The report also brings out the fact that while the taxes paid by the industry as a whole have increased 41.6 per cent since 1917, the increase has been greater for the larger than for the smaller properties. On roads with receipts of more than $1,000,000 the per cent increase has been 44.4, for those between $250,000 and $1,000,000, 40.9, and for those with receipts of $250,000 and less, only 4 per cent.

Table XI is published to show the considerable variation in the income, operating expenses, etc., per revenue passenger for different states.

EMPLOYEES

Table XII shows the number of employees, salaries and wages by occupational classes for the last two census years. In this grouping "officials" comprise presidents, vice-presidents, secretaries, financial secretaries, treasurers, assistant treasurers, auditors, counsel and similar officials. Managers and superintendents include the general manager, assistant general manager, general superintendents and superintendents of departments. The third class is made up of clerks, stenographers and other salaried employees not included in the first and second class. Under the main heading "wage earners," "other wage earners" are made up of power plant employees, employees of maintenance of way, transportation and equipment departments, elevated and subway guards, and employees of electric light and power departments which did not make complete separate reports for such departments.

The striking feature of this table is a large reduction

TABLE XIII—STATISTICS OF EMPLOYEES FOR COMPANIES OF DIFFERENT CLASSES, 1922

	All Companies	Companies Divided According to Annual Income from Railway Operations: Over $1,000,000	Between $1,000,000 and $250,000	Less than $250,000	Companies: Without Commercial Lighting	With Commercial Lighting	Elevated Railways and Subways *a*	Surface Lines *a*
Salaried employees								
Number, total	30,239	22,315	5,190	2,734	22,959	7,251	1,372	28,867
Per 10 miles of track	6.88	8.11	5.08	4.40	6.37	9.30	15.99	6.70
Per 1,000,000 car-miles	14.23	12.82	20.17	21.70	12.57	24.41	4.52	15.85
Per 1,000,000,000 revenue passengers	2.39	2.01	4.71	5.73	2.02	5.47	0.79	2.64
Wage earners								
Number total	270,284	222,105	33,921	14,258	224,474	45,665	26,007	244,277
Per 10 miles of track	62	81	33	23	62	59	303	57
Per 1,000,000 car-miles	127	128	132	113	123	154	86	134
Per 1,000,000,000 revenue passengers	21	20	31	30	20	34	15	22
Conductors, motormen and one-man car and bus operators								
Number total	130,628	107,554	15,786	7,288	111,063	19,485	*b*3,911	126,717
Per 10 miles of track	30	39	15	12	31	25	46	29
Per 1,000,000 car-miles	61	62	61	58	61	66	13	70
Per 1,000,000,000 revenue passengers	10	10	14	15	10	15	2	12

a—The group classification covers all tracks of the companies allocated according to the principal class of track, the "Elevated and Subway" group including a minor amount of surface trackage and the "Surface" group including some elevated and subway trackage.
b—Exclusive of guards on subway and elevated trains, who are classified under "all other wage earners."

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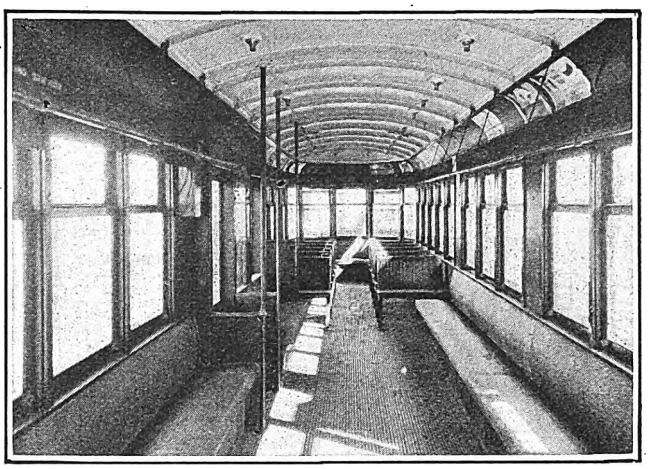
in the number of conductors and motormen since 1917. Of course, this is due in very large part to the increased use of one-man cars, and it will be noted that the total number of motormen and one-man car operators reported for 1922 exceeds the number of motormen (including one-man car operators so far as reported) shown for 1917. The report says that there is also probably more efficient operation and a tendency on the part of some companies to operate fewer cars in order to reduce expenses.

Table XIII shows some interesting averages as regards employees of companies of different types. During 1922 the average number of revenue passengers per employee was 42,148 and per car operator 97,267. Car operator in this connection is understood to be a motorman, conductor or one-man car operator. Elevated railway and subway guards are not included in this designation.



An Interior View of the Dayton Car After Rebuilding
Cross-seats were put into the rear section to induce passengers to move back from the front entrance. All piping and control wiring are installed under the longitudinal seats.

Center-Entrance Trailers Converted to One-Man Motor Cars

People's Railway Company of Dayton Installed Front Entrance Door so That Passengers Board at the Front and Alight at the Center

BY THE conversion of three center-entrance trailers into front-entrance, center-exit, one-man cars the People's Railway of Dayton recently obtained needed additional motor car equipment at minimum cost, and at the same time succeeded in making the converted cars pleasing in appearance and efficient in operation. This work, which was done by the Cincinnati Car Company, involved the addition of four GE-264 motors with single-end K-35 control, rebuilding of former trail trucks for motor operation and installation of a front door, air compressors and safety car devices.

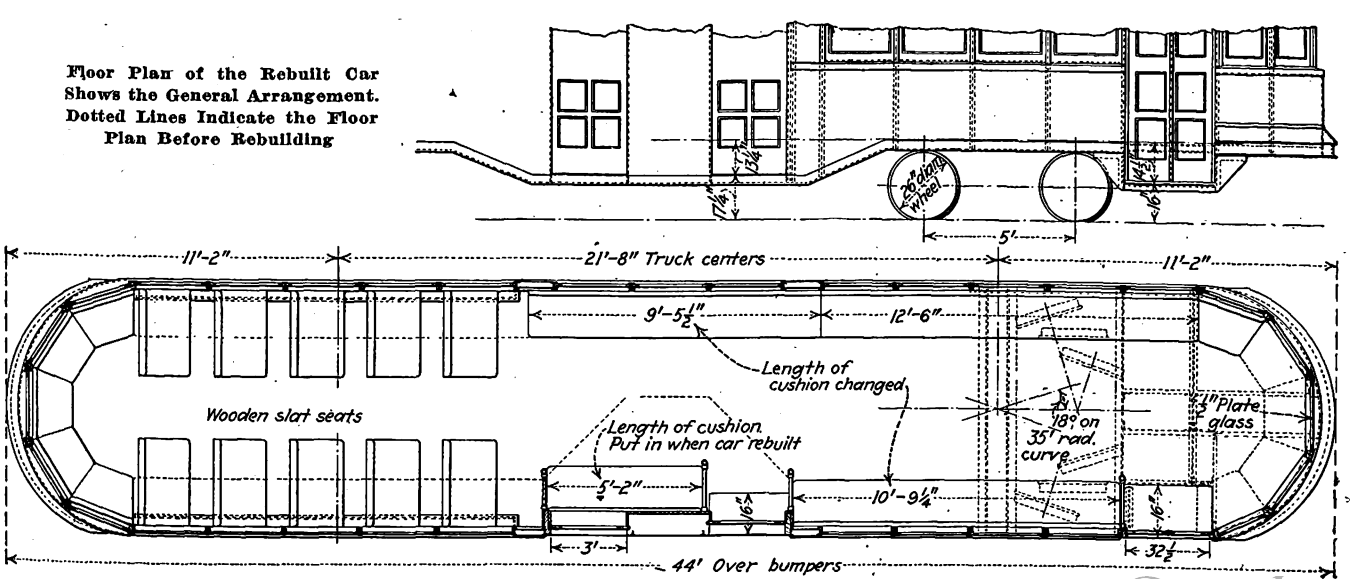
The original trailers, which are shown in an accompanying illustration, were equipped with two hand-operated sliding doors at the center, and with longitudinal seats throughout. These cars were originally built to handle war-time traffic, which consisted of very heavy peak loads from certain designated points, for which trailer equipment was considered particularly suited. In addition to this, motor cars in Dayton were at that time operated by two men, and the use of trailers meant the saving of one man for each two-car unit. After the war, and with the adoption of one-man operation, the conditions which originally favored the building of trailer equipment were eliminated, and consequently it became desirable to convert this equipment into one-man motor cars suitable for all-day service. The operation of several old and heavy motor cars to meet the traffic demands made it particularly desirable to provide additional light-weight one-man equipment which would allow the heavier and older cars to be reserved for rush-hour service.

The appearance and floor plan of the converted cars are also illustrated. It was considered desirable to substitute cross-seats for the longitudinal seats in the rear section of the car, so as to induce entering passengers to move back from the front entrance. Since only one of the center doors was needed as an exit, the other center door was blocked shut and additional seats installed in front of it as shown in the drawing. The large step well formerly in the center of the body was covered over except for a small space in front of the exit. This allows passengers to move readily from the front to the rear section, without stepping into the well.

In doing this work, the step-well structure was left in place, and a false floor was laid over it so as to make the whole body floor level. Additional framing was installed so that the side sill could be cut to form the well for the front door.

A CP-27 air compressor was installed under the car near one rear corner. Due to lack of room under the

Floor Plan of the Rebuilt Car Shows the General Arrangement. Dotted Lines Indicate the Floor Plan Before Rebuilding



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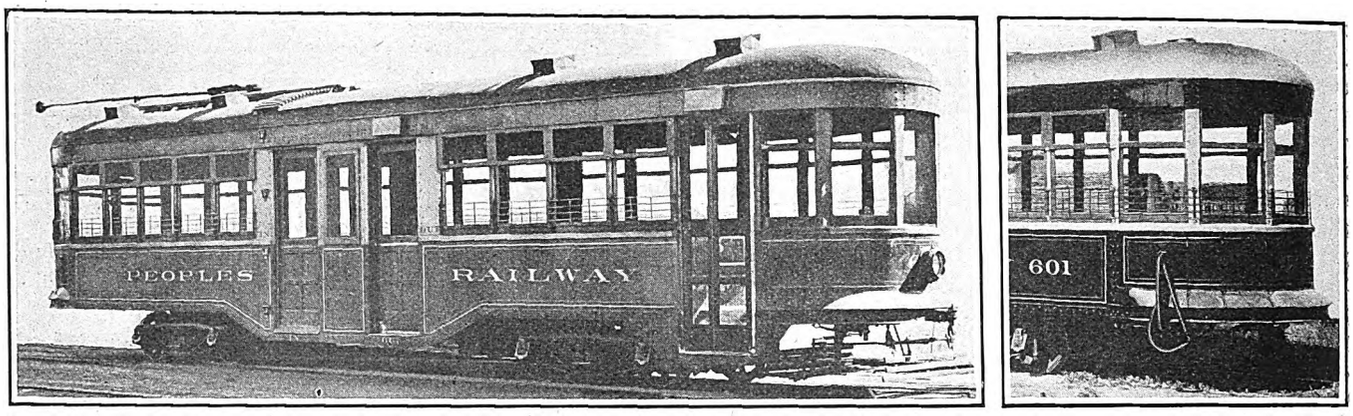


Appearance of the Dayton Trailer Before and After It Was Rebuilt Into One-Man Motor Car

The rear door near the center was blocked shut and a new entrance door put in at the front end. Lamps installed in the small housings over the tops of the doors illuminate the steps and the ground at night, when the doors are open. The front end of the car, before reconstruction, is shown at the right.

car on account of the framing of the old center well the air tanks were installed inside the body under the longitudinal seat. All piping and control wiring were also put under the longitudinal seat, the wiring being installed in flexible conduit. The M-28 brake valve, which is part of the safety car equipment, controls the front-entrance door, while the center door, which is also operated with a National Pneumatic engine, is controlled from an auxiliary valve installed in a convenient position.

Inside the car a mirror is mounted in front of the operator so that he can see passengers at the center door. A similar exterior mirror on the vestibule corner post gives him a view of the center door from the outside so that he can see when passengers have alighted so that it is safe to close the door. This is interlocked so that he cannot start with the door open. Outside lamps mounted above the front and center doors illuminate the step and the ground near the car. These lamps are lighted by switches on the floor engines when the doors are opened.

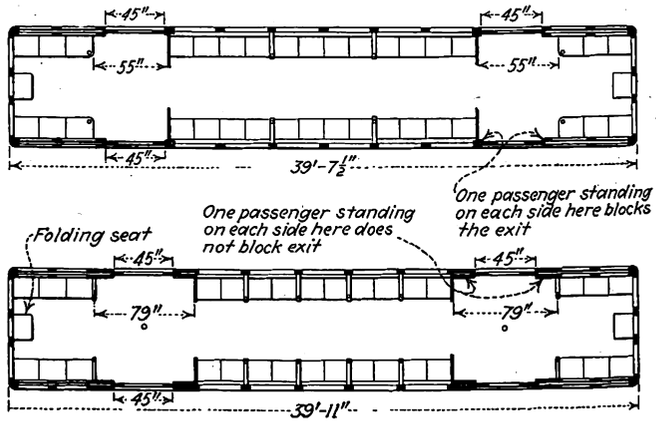
Conversion of the trucks for motors involved rebuilding with larger diameter axles and 26-in. wheels in place of 24-in. This work increased the weight of each truck from 3,600 lb. to 4,000 lb. without gears. The original light weight of the trailers was 21,368 lb. complete. The changes and additions for one-man motor operation increased this weight to 28,800 lb. complete. The cars have a seating capacity of 50 passengers. This is slightly less than that of the original trailers due to removal of the circular seats at the front end to provide space for the operator.

New Door Arrangement on the Berlin Elevated

To Prevent Door Blockades in the Cars Recently Installed, the Seating Arrangement Has Been Changed and Thus More Space for Passenger Movement Secured

IN THE new side-door cars now being put in service on the Berlin Elevated & Underground Railway, a different arrangement of doorway has been introduced to prevent the blockading of the side entrances by standing passengers. This same difficulty of blockading has been experienced on rapid transit lines in the United States as well as in Berlin. It is found that when cars are crowded, there is a tendency on the part of one or more passengers at an entrance to remain close to the opening and maintain a position there at stops by grasping any handhold that may be available. This requires other passengers to force a way past. The thought of those thus blocking the doorway is evidently that if they step out onto the platform to leave the passage clear, they will not recover their advantageous position near the door.

In the United States efforts to overcome this practice have included the removal of all handholds on the inside



The Old Type of Car on the Berlin Elevated Above. The Latest Type Below. The Latter Drawing Shows the Wider Spacing of Seats Opposite the Side Doors

of the car near the doors, and in one case, the Interborough Rapid Transit subway in New York City, a dividing barrier has been placed at the middle of the entrance so as to provide two passages, each wide enough for only one person.

On the new Berlin Elevated cars the attempt has been made to grapple with this problem by setting the seats back on each side of the entrances. In the old cars, the door was 45 in. wide and the spacing between the seats adjoining the door entrance was 55 in. This distance has now been increased to 79 in., so that one standing passenger on each side of the door leaves an opening at least equal to that of the door. To accommodate this change, the cars are made 3½ in. longer. The number of low partitions, or arm rests, between seats and the number of stanchions used for handholds has been increased in the new type of car. One of the stanchions in the new design of car is set opposite the entrance in the middle of the car.

As shown in the accompanying illustrations, there is a folding seat at each end of the car and no passageway between the cars of a train. More distinct coloring to distinguish the cars of the two classes operated has also been adopted in the new car.

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The News of the Industry

Plans for Increased Travel

Georgia Company Announces New Car Purchases and Bus Extensions Following Ouster of Jitneys

With the signing of the new ordinance barring jitneys from competing with street cars in Atlanta, Ga., plans are being made by the Georgia Railway & Power Company to meet the increased travel which is expected on March 8 and thereafter when the jitneys will have ceased operation. The company announced on Feb. 9 that it had placed orders for the immediate delivery of 20 new, large and modern street cars, which will be put into operation as the jitneys cease to run. According to officials of the company, the elimination of the jitney is only the first step in solving the city's transportation problem, and it is ready to do its full share in putting the Beeler recommendations into effect. They stated that the company was willing to confer with city officials as to the best manner of handling the situation and would co-operate with the city in every possible way.

As one of the first steps in this direction it is indicated that at least two bus lines will be established in the near future by the company to supplement its railway system and serve sections of the city not as yet reached by any street car line. In fact, on Feb. 12 the company petitioned the City Council for the right to operate buses over two designated routes. One route is through the Peachtree-Morningside district of the city and the other through the Boulevard Park-Highland Avenue districts, both of which are at present inadequately supplied with street car service.

While it is not yet known what type of bus will be selected, or exactly how much money will be spent upon the auxiliary bus system, it is understood that at least 15 20-passenger buses will be ordered by the company and that several hundred thousand dollars will be invested by the company in buses, garages and shop facilities for carrying on this line of work.

The routes selected for the first two lines are, with a few minor changes, those pointed out by the Beeler report, and stopping places will be indicated by neat coach stop signs similar to the car stop signs now in use.

In asking for permission to operate the two coach lines, the company points out that a heavy initial investment will be required to start operation, that the lines will have to be operated at a loss for at least a year while patronage is being built up and that the investment will be justified only if the company is given the exclusive use of the two routes.

The fare on the new bus lines will be the same as that charged on the street cars, it is understood, and if the trade develops properly and the experiment is a success other buses will be added to the equipment of the company and other routes added to supplement the street car system.

Entrance of the Georgia Railway & Power Company into the bus field has been under consideration for some time and awaits now only the approval of the City Council. The company states that it is "deeply appreciative of the action of the City Council in voting for the elimination of unregulated jitney competition with the street railroad" and that it will work toward a definite solution of the city's transportation problem.

Maine Central to Study Electrification

Murray & Flood, consulting engineers, New York, have been retained by the Maine Central Railroad to investigate and report to President McDonald within six months upon the cost and feasibility of electrifying the main line of the company from Portland to Bangor, including various related yards.

Electrification Goes Ahead

Review of Work on Roads Out of New York City Under Jurisdiction of State Utilities Commission—Work on Long Island Road's Babylon Line to Be Finished on Time

RAPID progress is being made by the Long Island Railroad in electrifying that portion of its line now operated by steam from Valley Stream and Jamaica to Babylon, a distance of more than 25 miles. In fact the progress made so far indicates that the schedule will probably be met which called for the work to be finished by May 1, 1925.

It is planned to rehabilitate the old Central Extension branch from Bethpage Junction to Babylon, so that it may be placed in operation and thus relieve the electrified section of the heavy summer traffic to the Hamptons and the South Shore of the east end of the Island as well as furnish better service to daily patrons east of Babylon.

At present there remains only 15 per cent of the work planned to complete electric operation to Babylon; 36 miles out of 53.25 miles of third rail has been laid; 16.7 miles out of 18.6 miles of a new high-tension transmission line extending from Lynnbrook to Babylon has been completed; the rebuilding of an existing pole line from Rockaway Junction to Valley Stream to permit transmission at 33,000 volts instead of 11,000 is about 10 per cent completed. There remains to be undertaken pole line work between Valley Stream and Cedarhurst and the installation of an additional feeder between Dunton and Rockaway Junction. A new duct system from White Pot to Dunton, 16,495 ft. in length, has been completed. Substation buildings at Laurelton, Freeport, Wantagh and Babylon have been completed. Those at Amityville and Lynbrook are about 75 per cent completed. Equipment has been installed at Babylon and Wantagh.

This is only one of the pieces of electrification work going on under the jurisdiction of the Public Service Commission of New York. Hearings are in progress upon the petitions filed in connection with the electrification of the Yonkers branch, that portion of the Putnam division in the city of Yonkers, and the Port Morris branch of the New York Central Railroad. An order has been adopted approving the petition of the New York Connecting Railroad to complete the electrification of its railroad in the Borough of Queens. A determination was reached early in 1924 in the matter of the electrification of the Staten Island Rapid Transit Railway and the Staten Island Railroad.

Progress on Staten Island Work

This project is now well under way, approximately 70 per cent of the scheduled work having been completed. A contract has been made by the railroad with the Staten Island Edison Corporation under which the latter will furnish the energy to be used. This required extensive additions to plant by the Edison Corporation, about 40 per cent of which has been completed. It is now expected that electric operation upon Staten Island will be begun about Nov. 1, 1925.

About 90 per cent of all of the work required to relay the main running tracks with 100-lb. rail has been completed, 65 per cent of the necessary third rail ties has been installed, 35 per cent of the third rail has been distributed, bonding, preliminary signal installation work, platform changes and other work are progressing rapidly. Plans for all of the necessary substations are completed and all of the material with which to equip them has been ordered. Orders have been placed for 80 multiple-unit cars to be operated upon the railroad. The Staten Island Edison Corporation has made an effective start in necessary changes at its power plant.

The most important and extensive change from steam to electrical service contemplated under the so-called Kaufmann act is the change to be made by the New York Central Company in its operation on the west side of New York City. The railroad filed a petition to

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substitute electricity for the present steam motive power. Hearings were promptly undertaken jointly by the Public Service Commission and the Transit Commission of the State of New York. It very early developed in these hearings, however, that the change from steam power to electric power could not be undertaken until arrangements were made not only for the necessary grade crossing changes but also for the essential relocation of a considerable portion of the railroad's line on the west side of New York. These matters are not under the jurisdiction of the Public Service Commission. It is the understanding of the Public Service Commission that they are under consideration by the authorities of the city of New York and the railroad and within the last month some three grade crossing changes were ordered by the State Transit Commission.

$100,000 Bus Plan for Suburban Rochester

The Rochester Co-ordinated Bus Lines, subsidiary of the New York State Railways, Rochester Lines, has announced plans for a network of bus lines through the towns of Greece, Parma, Hilton and places along Lake Ontario between Charlotte and Manitou Beach, provided the Rochester-Manitou Railway's petition to discontinue its line is granted by the Public Service Commission. The lines planned by the railway will entail an expenditure of at least $100,000.

The Manitou line, a 9-mile railway, operates only during the summer and serves lake shore colonies. The railway now plans year-round bus service. Plans are being discussed for turning the roadbed into a highway, but operation of the bus service by the railway is not contingent upon this.

The fight is still on between the railways and the Ridge Road bus line. The Council granted the Ridge line permission to operate its buses into the Broad Street terminal in Rochester, but barred their taking passengers within the city limits. The railways countered with an application to open a bus service over the Ridge Road. The town of Greece has granted this permission and the matter is before the Public Service Commission. The move will be fought by the New York State Auto Bus Association, of which James J. Dadd, Rochester, is secretary.

The New York State Railways, through its subsidiary, operates the East Avenue bus line, the Dewey Avenue feeder line and a crosstown trackless trolley line. The new plans indicate its intention to enter the bus business on a wide scale, based on the success of its experiments to date.

The petition to the commission asking permission to abandon the Rochester-Manitou line sets forth that in 1922 the net loss was $5,809; in 1923 it was $7,371 and in 1924 $12,815. The petition shows that the company has a deficit of $25,882, with cash on hand of only 50 cents, and miscellaneous accounts receivable of only $10, whereas it owed $12,607, besides its funded debt of $85,000 principal and $1,808 accrued interest.

Commission Blameless, But Needless

Governor Smith Runs with the Hares but Holds with the Hounds on New York Situation

Governor Smith of New York recommends the abolition of the present Transit Commission and the transfer of its duties and powers to the Board of Transportation of New York City. This he did in a message sent to the Legislature on Feb. 16 in which he reviews the investigation conducted by Supreme Court Justice John V. McAvoy into transit matters in the city of New York and quotes at length from his report.

Touching upon the bus situation, the Governor in his message said:

> Illegal operation of buses is against the law and nobody can defend it. A municipality should not be above the law any more than an individual. While this report makes no definite recommendations as to legislation, I call your attention to my annual messages of 1923, 1924 and 1925 and special messages dealing with this subject, in which I have repeatedly urged that all the cities of the State be given the right to own and operate bus lines.

Reference is also made by the Governor to that part of the report of Justice McAvoy in which the justice said:

> The proof presented with respect to the charges filed by the Board of Estimate and Apportionment against the Transit Commissioners shows that the charges are without foundation and that no cause exists for the removal from office of the Commissioners.

In his comment on this the Governor said:

> I approve this conclusion. There is, however, a sharp distinction between the removal from office of individual commissioners upon charges of misconduct and the abolition of a commission itself as an agency of government. After removal upon charges the obligation would still rest upon the Governor to appoint successors to the office. I have held continuously since 1923 that there is no need for such an agency of government as the Transit Commission. Its existence in the city of New York has given rise to a division of responsibility in the past with respect to transit matters.

In 1923 and 1924 the Governor recommended the abolition of the Transit Commission and stated that in his belief its powers could be lodged in the municipality. Since that time the power to construct new subways has been taken from the Transit Commission and placed in the Board of Transportation of New York City, but all other powers remain as before in the Transit Commission. He is still of the opinion that the Transit Commission should be abolished. He said:

> The deplorable transit conditions in New York are admitted by everybody. The immediate question, therefore, is relief, and relief at the earliest possible moment for the millions of people who live in the city of New York. I urge upon the Legislature to study the constructive recommendations of this report and by following the recommendations herein contained to make its contribution to the health, happiness and comfort of the people of the largest city in the country.

Meanwhile, Senator James A. Higgins has introduced a bill calling for a referendum on municipal operation of subways and a 5-cent fare. A second new bill, offered by Senator Thomas F. Burchill, demands that the Interborough, B.-M. T. and all other railroad companies in the metropolis replace wooden cars with steel ones within a year. This is direct repudiation of Justice McAvoy's findings, which declared wooden cars safe.

Four bills have been introduced in the New York Legislature which seek to afford legal aid to operation of motor buses. One of the measures would authorize street surface railroads to exercise all powers conferred by law upon a stage coach corporation. At the present time it is necessary for an electric railway wishing to operate a bus line to do so through a holding company. Another measure would amend the railroad law by authorizing the Public Service Commission to permit a street surface railway to substitute a stage route, bus or motor vehicle route in place of any part of its railroad. Still another bill would amend section 22 of the transportation corporation law by empowering stage coach corporations to own, maintain and operate automobiles and other vehicles for transporting persons for hire, including sightseeing trips. The fourth bill would add a new section to the transportation corporations law authorizing the Public Service Commission to grant a stage coach corporation a certificate for operating a through route, in lenth 100 miles or more in one general direction, without the consent of local authorities.

Service Cuts in Buffalo—Mayor's Baiting Tactics Harmful

Service on five local lines of the International Railway in Buffalo, N. Y., will be abandoned on Feb. 22 and schedules on various other lines will be materially curtailed as the result of increased operating deficits. Every possible economy will be made.

On Feb. 15 the company placed one-man cars in operation on the Seneca Street and South Park lines, two of the heaviest patronized lines in the city, and on Feb. 22 the use of one-man cars will be extended to three other local lines. One-man cars will soon be in service on practically all the local lines in Buffalo where near-side pay-enter cars are in operation. This economy in operation is expected to save the railway upward of $700,000 annually.

Mayor Frank X. Schwab announced he would declare an emergency existed and would issue permits for the operation of jitneys as soon as the railway abandoned service on its local lines.

Criticism of the attitude of the Mayor in his handling of the traction problem is voiced by Herbert G. Tulley, president of the International Railway, in the current issue of "Tulley Talks," distributed by the railway to car riders. Mr. Tulley said in part:

> Encouraging the strikers, who had under a previous management tied up every street car in Buffalo in order to enforce the immediate payment of increased wages, was certainly the wrong way to go about reducing the company's operating costs so as to help it to keep the 5-cent fare. Encouraging jitneys to rob the company of its most profitable short riding, as was done, and the delaying of bus consents to the International for so long a period, had also a very bad effect. The city should have granted the company the right to operate and then helped us to keep fares down, as well as costs, which must always be paid from fares.
>
> The Mayor's New Year greeting contained the words, "Small-town criticism has no place in the city of Buffalo, and a resolution that should be made by all of us might be, 'Here's where I live. I will boost Buffalo in 1925.'" I. R. C. men and managmeent would gladly give the goodby to "small-town criticism" and help the Mayor keep his 1925 resolution, so that car riders may benefit from city-company co-operation in a measure comparable with the possibilities already shown by co-operation of men and management.

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Board Recommends Service Improvements in Trenton

The Board of Public Utility Commissioners of New Jersey recently submitted a report outlining the results of an investigation into the trolley service in Trenton. The suggestions for improving the service were applicable to the Trenton & Mercer County Traction Corporation and also to the regulation of traffic by the city authorities. The commission felt that one of the principal sources of complaint was irregular headway. It recommended the use of more men to supervise operation of cars. It also recommended that car platforms should be reconstructed to facilitate speedy loading and unloading. As another remedial measure the board recommended additional layovers at the various terminals to permit the absorption of delays in normal running schedules. It urged additional facilities for turning back cars where there had been unusual breaks in the headway.

So far as the City Commissioners were concerned the board recommended further regulation of traffic by the elimination of parking in the center of the city between certain streets, at least during the peak traffic hours, and the further diversion of motor vehicle traffic from the more congested thoroughfares upon which the trolleys were operated. In making its recommendations the board said that it was mindful of the difficulties of the situation because of the narrow streets and the tremendous growth in automobile traffic. It believed that service could be improved by co-operation between the City Commission and the company.

Bus Bill in Massachusetts Provokes Discussion

Representatives of the bus lines in Massachusetts resent the thought of being placed under control of the Massachusetts Department of Public Utilities. This they made plain in their fight against a bill to regulate them, filed by Clinton Q. Richmond, president of the Berkshire Street Railway, when the matter was discussed by the joint legislative committee on street railways. Mr. Richmond would require bus lines to secure a certificate of convenience and necessity from the Department of Public Utilities in addition to the permission of local authorities in communities in which they plan to run. The department would be permitted to refuse or recall the license and indicate the route.

Day Baker, who represents the bus owners, contends the only dispute between the railways and the bus owners is over the question of the proper board of regulation. He says that the Department of Public Works is best qualified to have jurisdiction. He has a bill that would make the Public Works Department the sole authority to license operations when the routes extend beyond any city or town. Mr. Baker said that at present one city or town may hold up the entire operation by refusing permission to pass through that particular locality.

James M. Swift, counsel for the Motor Coach Association of New England, is supporting the Baker bill. W. F. Smith of the Royal Blue Line, George E. Marsters of the Marsters Tours, B. L. Thomas of the Sightseeing Tours and Harry J. Dooley of the Gray Line Auto Tours also are in favor of the Baker bill.

2,000,000 Bus-Miles in Detroit

The Department of Street Railways in the City of Detroit is installing another bus line to have a length of 3.8 miles, making the eighth coach line for the motor coach division to operate. This line will extend from the terminal of the Fort Street car line at the West Jefferson carhouse to State and Fort Streets in the village of Lincoln Park. According to Ross Schram, general manager of the D. S. R., the city will operate over 2,000,000 coach-miles this year. Six coach lines were started in the month of January with a total of 23 miles and 250,000 fares were collected during that month. It is anticipated that within 30 days the D. S. R. will be collecting 350,000 bus fares monthly.

The line on West Fort Street will exhaust the last of the 50 single-deck buses rented from Dodge Brothers. More buses are to be requested from the Council and it is also planned to build two service garages, one for the east side and one for the west side of the city, to care for the buses.

Operators of the city buses are obtained largely from among the D. S. R. platform men. The D. S. R. motor coach division is expanding so fast that difficulty is found by the department in keeping up with the demand for revision of running schedule. Maps have been prepared by H. M. Gould, assistant general manager, and Frank Peppler, superintendent of the division, showing the location of all the coach lines. Patrons of the line are supplied with copies of these maps and also with time schedules. Criticisms or suggestions in regard to the service are solicited from the patrons.

Accidents Decreased 23 per Cent

One year of an intensive accident campaign on the Chicago Surface Lines has resulted in a reduction of 23 per cent in fatalities. All accidents, regardless of responsibility, are included in the figures, which will be published in advertisements in Chicago newspapers. The campaign was conducted by Victor T. Noonan, who addressed 100 group meetings in 1924. The statement "Saving Lives," follows:

There was a reduction of 23 per cent in the number of fatal accidents on the Chicago Surface Lines last year as compared with 1923.

This was achieved despite the fact that a hundred more cars were in operation and several hundred more men were employed on the system last year, and at least 50,000 more automobiles were on the streets.

It is a direct result of careful organization in the interest of public safety.

A general advisory council composed of company officials meets with the company's accident prevention engineer at regular intervals to determine safe policies.

Employees' councils study accident prevention and report unsafe practices and conditions to the accident prevention engineer and the general advisory council.

One hundred group meetings of employees were held last year for the purpose of discussing safety.

Thus every individual is brought to realize his personal responsibility for the comfort and safety of others.

Every week is safety week on the Surface Lines.

Ottawa Revenue Loss Charged to Bus Competition

The Ottawa Electric Railway, Ottawa, Ont., says that the operation of bus lines is largely responsible for the receipts of the company falling $109,484 below the estimate for last year as made in the Feustel report. This contention was made by the company in a letter to the special street railway committee, which met recently. The company claims that the bus lines are breaking the law by carrying passengers from one point to another within the city limits. The company asked the city to co-operate in securing legislation to prevent the bus lines operating within the city. The committee agreed to the company's plea for special legislation and also agreed to co-operate with the company in an application for increased borrowing powers.

The company now has power to borrow on bonds up to $1,000,000 for construction work. It wants to borrow up to 75 per cent of its assets if necessary. The committee agreed to recommend that the company be allowed to defer the construction of the extension from Queen Street along Lyon to Gladstone. This was to be done this year, but the company points out that the extension is not warranted by the receipts. Major F. D. Burpee, vice-president and manager, said that the company was prepared to carry out other extensions in the second year's program. There was no objection to the company's proposal that 40 double-truck or large cars should be built within the next 2 years instead of 27 large and 20 small cars in 5 years.

Suggests Relief for Tacoma Property

Recommendations have been made which favor the granting of certain concessions to the Tacoma Railway & Power Company, Tacoma, Wash., in the matter of paving requirements, the hauling of city employees and direct competition by buses, on the basis of a 2-year experiment, without abrogation of existing franchises. The suggestions were contained in the report of the committee on transportation of the Federation of Improvement Clubs recently submitted to the City Council. The committee suggested that the company be relieved of paving payments except to the extent to which the cost of paving is increased by reason of the presence of the street car tracks, but asserted that maintenance of paving between tracks should continue as an obligation of the company. It suggested the regulation of buses by requiring them to run on other streets than those with car tracks and requiring a tax from them. It also favored the abolition of free rides for city employees except policemen on duty, and expressed the belief that for such concessions the street car company should be willing to extend service to present unserved sections. Admitting that a gross earnings tax on a corporation shown to be losing money is probably unjust, the committee said that relief from this tax should be a last resort. The report finally urged greater co-operation between the city and the railway.

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St. Louis & Kansas Line Seeks Certificate

Incorporators of the proposed short line electric railway between St. Louis and Kansas City, Mo., appeared before the Missouri Public Service Commission at Jefferson City on Feb. 11. They are seeking a certificate of convenience and necessity to operate the line, but announced they were not ready to make a detailed showing of the financial backing of the new venture unless the members of the commission absolutely insisted upon it. The commissioners did not press the point at this time and the hearing was adjourned until March 5.

Lee Dunlap, Kansas City, vice-president of the new road, which will be known as the St. Louis-Kansas City Short Line Railroad Company, and S. J. McWilliams, Kansas City, counsel for the road, appeared for the road, but did not go into its finances except to say that bonds probably would be sold to defray part of the cost. The other incorporators of the road, which was granted a charter on Nov. 28, 1924, are Frank E. Lott, Kansas City; Ernest H. Lawton, Erba D. Smith and William H. White, St. Joseph. When the charter was issued it was stated $240,000 in stock had been subscribed of the total capital stock of $2,400,000.

At the hearing on Feb. 11 Mr. Dunlap stated that virtually all the needed right-of-way across the State had been obtained. The proposed line extends from University City, Mo., to Kansas City, a distance of 238 miles. The principal towns that will be served are: St. Charles, Warrenton, Columbia, New Franklin, Marshall, Higginsville and Independence. The road will construct two bridges across the Missouri River, at Creve Cœur and Arrow Rock.

Charles G. Miller, Kansas City, attorney for the Chicago & Alton, the tracks of which will be paralleled half way across the State, was the chief inquisitor for the steam railroads. H. H. Larimore of the Missouri Pacific and H. J. Nelson of St. Joseph, representing the Burlington, protested that before the road was authorized to sell stocks or bonds it should be made to prove its financial responsibility.

It has been estimated the road will cost $26,000,000 for construction and equipment. The new road will parallel the Wabash from St. Charles to High Hill and the Chicago & Alton from Marshall to Kansas City. This project was referred to previously in the ELECTRIC RAILWAY JOURNAL.

P.R.T. Puts Into Operation First Loading Platform

The first trolley car loading platform for passengers to be operated in Philadelphia, Pa., was installed alongside the westbound trolley tracks on Market Street, at 12th, on Feb. 8, and immediately placed in use. The platform was built and installed by the Philadelphia Rapid Transit Company at the request of the Highway Bureau. The Council appropriated $15,000 to pay for the construction and installation of a number of the platforms as a measure to protect car riders from automobiles while waiting for cars, and the Highway Bureau of the Department of Public Works was authorized to proceed with the project. After consulting with the P.R.T., Highway Bureau officials found that the company could construct and place in position the platforms more economically than the city could do it and it was arranged for the company to do so.

The platforms are built in sections 21 ft. long, which may be joined, end to end, so that a platform of any length desired may be placed at a car stop. They are 5 ft. wide and 6 in. high. Iron uprights, along the tops of which a chain is strung, are placed at intervals of several feet along the side of the platform toward the curb, so that passengers waiting for cars are fully protected from automobile traffic.

If the operation of this platform is successful others will be placed throughout the city at points where traffic is heavy.

Seeks 8-Cent Fare in La Crosse

Confronted by an unsatisfactory operating condition which could only be eliminated by higher fares and lower operating costs if it is to continue its business along profitable lines, the Wisconsin Railway, Light & Power Company has filed with the Wisconsin Railroad Commission a petition asking for an increase in fares in La Crosse from 7 to 8 cents. The company also seeks to abolish three cut-rate privileges covering eight tickets for 50 cents, the monthly commutation tickets of 50 for $2.75, and books of 20 tickets for $1 to school children. For these it would substitute a book containing seven tickets for 50 cents. Permission is also sought to use one-man cars on the north side line.

R. M. Howard, vice-president and general manager of the company, explained that in 1924 and previous years the company was unable to earn the usual return allowed by law on its investment. Responsibility for this condition was attributed to paving expenses of $50,000 in 1923 and 1924 and increased use of the automobile.

Suggests Fellow Workers on Board in Detroit

Ross Schram, general manager of the Detroit Department of Street Railways, has made a proposal that its platform employees nominate a group to act in place of the trial board to discipline fellow employees. At present the board is composed of Department heads. The proposal was made to Neil McLellan, secretary of the street car men's union, in answer to a protest against what Mr. McLellan said was an encouragement by the department of complaints from the street car riders.

It was announced that criticism would be welcomed by the head of the department as in the past, but there was no objection to having the men select a group from among their own number to judge the fairness of the complaints. The management will assume the roll of prosecutor in the trials of employees accused. If such a plan is favored by the men or if another plan is advanced by them it will be given a month's trial to determine whether or not it fits in with the policy of the department for improving service to the public by giving the men added responsibilities.

Wisconsin Commission Sanctions Extensions

The Railroad Commission of Wisconsin has voted two to one to grant a certificate of public necessity and convenience to the Milwaukee Electric Railway & Light Company to build an electric railway 3.49 miles long for freight-hauling purposes from its Lakeside power plant west through the town of Lake to the freight lines of the Chicago & Northwestern Railroad, and another line 8 miles from Clement Avenue paralleling the Chicago, Milwaukee & St. Paul line to a point 1½ miles south of South Milwaukee, where it will join the Racine interurban line.

The company sought the right to build the first-mentioned line in order to insure an adequate and unfailing supply of coal for the power plant and a right-of-way for a transmission line.

The route from Clement Avenue is to be used as a cut-off for through passenger trains on the Racine interurban line.

Commissioners Gettle and MacDonald point out that the route recommended by the Public Land Commission is about a mile south of the one petitioned for by the company, but that under the law the company has a mile wide margin within which it can build its tracks, and the route proposed by the objectors is within the mile area. They also point out that about $175,000 has already been spent on the proposed route and that the plea on behalf of future zoning regulations could not be considered, as the commission cannot take into account what may happen later.

In dissenting on practically all points, Commissioner Kanneberg denied there would be any increased construction and operating costs and held that the law permitting change of route applies only to open country and not to a line in a town, village or city, although not incorporated. He also maintained that co-operation in zoning and other plans to aid in city planning activity must be considered by the commission.

Contract Legal if Approved

The city attorney of Milwaukee, Wis., has ruled that if the Common Council and the voters approved of the proposed service-at-cost agreement now being negotiated between the Milwaukee Electric Railway & Light Company and the city it would be legal, especially if the city and company entered into the arrangement voluntarily. He gave this opinion following the threatened plan of certain Milwaukee business men to invalidate the contract by legal action on the ground that the 1900 franchise was still effective. The city attorney explained that the company was now operating under the indeterminate permit law which superseded the franchise granted to the company in 1900.

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Student Rates Unfair and Hard to Collect, Says P. R. T.

The Philadelphia Rapid Transit Company, Philadelphia, Pa., believes that a reduction in fare for high school students would be both discriminatory and uneconomical. This is the substance of its answer to the students' associations of the high schools of the city, who petitioned recently for special reduced rates for high school students. The company said that it was in sympathy with the large number of students who were doing part time work in order to defray the expenses of their education, but that it would not be fair to extend to them a privilege which it would be impossible to give to the many thousands of young women whose financial condition was such that even a part time working plan would not enable them to secure a high school education. To the argument of the association that many cities do provide a special fare for students, the company said that in practically all cities where the privilege existed it had been inherited from early days when original franchise grants included this and other provisions based on other considerations than the cost of service. Experience and observation of the Philadelphia management had indicated that the practice involved so great a cost in collection as to eclipse any added revenue brought by increased riding.

The company stated that fare reduction for such of the high school students as were short riders must await completion of the Broad Street subway, at which time the company would advocate a 5-cent fare for the full length of all high-speed lines and a 5-cent zone system on surface cars.

Buses Affect Revenue of Dallas-Denton Line

Bus competition is affecting the revenue of the new interurban electric line of the Texas Interurban Company between Dallas and Denton, but the company has taken no action looking to a curtailment of service. Earnings of the Texas Interurban Company, which operates both the Terrell and Denton lines, failed to meet interest charges on its investment during January, but the loss was all on the Denton line.

The Terrell and Denton lines were built by the company in fulfillment of a commitment made when the railway franchise was granted to C. W. Hobson and associates in 1917.

Stations Lengthened in Brooklyn to Increase Capacity

In order to provide for the better accommodation of passengers by longer trains, the New York Transit Commission has formally directed the lengthening of all of the stations on the main line of the Fourth Avenue subway in Brooklyn. The commission has initiated the project with a request that the Board of Transportation make the necessary plans and supervise construction after an appropriation is obtained from the Board of Estimate and Apportionment. Eight-car trains instead of the present seven-car trains will be made possible.

The additional station-lengthening program includes the local stations south of Pacific Street to the end of the existing line at 86th Street. An extension of the Fourth Avenue line is under construction from 86th to 95th Street, Fort Hamilton, but the lengthening of the terminal station at the latter point, the only station upon the extension, will be taken care of during construction.

All will be lengthened to a full 530 ft. At present they are principally 435 ft. long, those more recently constructed being 485 ft. long.

For the fiscal year ended June 30 last the Fourth Avenue line carried 57,838,316 passengers, as against 52,193,641 in the preceding similar annual period.

Railway Expands Bus Lines in St. Louis

The West Florissant-Jennings, Mo., line of the St. Louis Bus Company, auxiliary of the United Railways, St. Louis, Mo., has proved a financial success and the company has placed orders for several additional buses to be used on the line. The Natural Bridge Avenue line is also beginning to make a little money. Patronage is building up very nicely and more buses will be added soon. On the West Florissant and Jennings line a branch leaves West Florissant Avenue at Helen Avenue and runs to Melrose Avenue. Eight White buses will eventually be used on this installation. For a time temporary equipment obtained from other bus companies was used in this service. When the St. Louis-Jennings Electric Railway was abandoned a few years ago the residents of Jennings and West Walnut Manor were left without adequate transportation, and the new bus line with transfer privileges to all the city street car lines proved welcome.

The acquisition of the St. Louis Bus Company by the United Railways has presented no insurmountable shop problems for the latter company. Prior to the opening of the bus lines the United Railways had large and strictly modern garage and automobile repair shops for its fleet of automobile repair trucks, track department vehicles and automobiles used by officials of the company. The 12 buses now in operation on the Natural Bridge Avenue and the West Florissant Avenue-Jennings-Helen Avenue lines are being housed in the general garage on Thirty-ninth Street just north of Park Avenue, near the general offices of the railway. The automobile repair shops adjoin the garage. The shops are equipped with the very latest machinery and machine tools for rebuilding and repairing automobiles and gasoline engines. The mechanics are specialists in auto work and at all times 18 or 20 boys from the various shop departments are students at the David Rankin, Jr., School of Mechanical Trades. While they are attending the school the boys are paid a minimum of 25 cents an hour, with an increase of 3 cents an hour every six months. When the boys finish their course they are given positions in the shops organization at the full wage of journeymen mechanics.

Exemption Ordinances Not Considered

Ordinances which would exempt the East St. Louis & Suburban Railway, East St. Louis, Ill., from obligations incurred under a franchise which recently expired failed to come up for final vote before the City Council at its meeting on Feb. 9. The Council had previously accepted an agreement with the company and approved a resolution to submit the ordinances to the people.

Michael J. Whalen, City Commissioner, has led the fight against the three ordinances which would exempt the railway from paving between its tracks on North Seventh Street and permitting the abandonment of services on other streets. He objected to a section in one of the ordinances which provided that the company should pay an annual tax of $25 a car, the number of cars to be based on an 18-hour unit of operation a day. The former franchise provided for the payment of $25 a year on each car operated.

At a caucus of the Council on Feb. 10 W. H. Sawyer, president of the railway, presented a certified copy of a resolution passed by Council on Aug. 5, 1913, which stated that in the absence of a definite method of calculating the number of cars operated by the company the fee provided for should be based on the number of cars in an 18-hour operating unit a day.

Buses Supplement Topeka Street Cars

New buses to serve as street cars for the outlying districts will be put in service by the Topeka Railway in the near future. Several of the buses have already arrived and are going through the paint shop. They will resemble the street cars in color and interior arrangement, each car seating 25. Passengers will enter and leave by the front entrance, but a rear door has been added for emergency use. The routes have not yet been mapped out. They will not be stub lines, but will run all the way downtown. Transfers will be interchanged between the buses and the street cars.

Bus Extensions in Oakland Announced

The Key System Transit Company will shortly begin the operation of four more bus lines in Oakland, Cal. This will bring the number of bus lines operated by the company in the East Bay cities up to ten. These bus lines have been installed as the result of the recent traffic survey and routed in sections that have grown to a point where more transportation has become vital.

In making public announcement of the new lines, the company said that all 10 motor bus services now in operation or arranged for would be continued, if the loss was not too great. The company said: "We ask your regular patronage in order that these services may be maintained and extended. All are now operated at a loss, some at an unjustifiable loss." The new buses are expected to be ready for operation by March 1.

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News Notes

Substitute Plan for Pittsburgh.—Car looping in Pittsburgh, Pa., was postponed recently pending trial of a new substitute plan agreed to by traction and downtown interests. Ordinances to bring the new plan to a focus were ordered drawn on Feb. 16 by the Council after a session with representatives of both sides of the controversy, which has been raging for several weeks. One ordinance to be drawn will be a new traffic measure which will add many downtown streets to the "AA" class of streets on which parking will not be permitted between 7.30 a.m. and 6 p.m. The other ordinance entails a franchise for the Pittsburgh Railways in Diamond Street, which would permit the company to create a loop. Mayor Magee indicated that the complete downtown parking regulations was an infringement on the work being done by R. W. Marsh, city traffic engineer. A traffic ordinance following his survey had been prepared, he said, but had been withheld from submission to the Council. He suggested that Mr. Marsh be included in the consultations of the interests and the traffic changes be worked out together.

Buses Succeed Cars. — The Union Traction Company, Santa Cruz, Cal., recently replaced two of its lines in that city with three 25-passenger Mack buses. Santa Cruz is a city of 11,000 population. The railway there has been operating 15 miles of line.

Board Intact. — W. W. Knight has been reappointed by Mayor Brough a member of the Board of Street Railway Control of Toledo, Ohio, for 6 years. The appointment is effective Feb. 1. Mr. Knight has already served a term of 4 years on the board and in the last 2 years has acted as chairman of the group. The reappointment of Mr. Knight will keep the membership intact. Other members are H. C. Truesdall, who has 4 years to serve, and David H. Goodwillie, who has 2 years yet to serve.

Refuses Higher Bus Fares.—The Public Service Commission has refused to grant the application of the International Railway, Buffalo, for an increase in bus fares on the Bailey Avenue line from 7 cents to 10 cents to make them uniform with the Delaware and Delavan Avenue bus lines. The company claimed it is losing $2,000 weekly on the Bailey Avenue bus route. This line is being operated at the same rate of fare as the street cars—7 cents or four tokens for 25 cents, with free transfers to connecting car lines. The company will abandon its Bailey Avenue car line between Broadway and East Seneca Streets on Feb. 22 along with four other local lines.

Bus Permit Granted.—The East St. Louis & Suburban Railway, East St. Louis, Ill., has been granted a permit to operate buses over the St. Louis Municipal Bridge and to loop around the downtown St. Louis business section. The permit was granted by the Board of Public Service of St. Louis on Feb. 13. The permit fixes the maximum fare at 10 cents. The East St. Louis & Suburban has also applied to the Illinois Commerce Commission for a certificate of convenience and necessity to operate motor express trucks in St. Louis and National City, Edwardsville, Collinsville, Shiloh, Fairmount City, Brooklyn, Madison, Alton, Venice, Hartford, Granite City, Maryville, Woodriver, East Alton, Lebanon, O'Fallon, Belleville and East St. Louis. W. H. Sawyer, president of the company, stated that the express trucks will supplement the present interurban freight and express service.

Experimental Bus Service in Ann Arbor.—Under the terms of the service-at-cost agreement with the city of Ann Arbor, Mich., the People's Motor Coach Company, which is affiliated with the Detroit United Railway, started bus service in Ann Arbor recently. The 5-cent trolley lines, which serve only a small part of the city of Ann Arbor, have been succeeded by a bus system of much greater route mileage and vehicle mileage at the following fare schedules: 10 cents cash, 8½-cent token, 50 rides for $3 on a punch card, and $1.25 weekly pass. The agreement permits the return to railway service after one year if the results with buses are not mutually satisfactory.

Commission Vacancies to Be Filled. —R. H. Musser, Plattsburg, Mo., one of the two Democratic members of the Missouri Public Service Commission, has announced his intention of resigning not later than March 1. His term expires April 15. The term of E. J. Bean, De Soto, the other Democrat, also expires April 15. Governor Baker will be urged to select engineers from St. Louis and Kansas City to succeed Messrs. Musser and Bean as the two major cities of the state at present are without representation on this important board despite the vast public utilities centered in those cities.

Joint Interurban and Bus Service.— An arrangement has been made between the Toledo & Indiana Railway and the Fort Wayne-Toledo Transportation Company to operate a joint service between Toledo and Fort Wayne, Ind., effective Feb. 15. Five trips each way daily will be scheduled. The running time is 4 hours and 10 minutes. The railway cars take passengers as far as Bryan, Ohio. From that point the run is made in buses by way of Hicksville and Harlan to Fort Wayne.

One-Man Car Service Started.—In accordance with authorization granted by the City Council of Macon, Ga., several months ago, the Macon Railway & Light Company recently started one-man street car service on the East Macon-Montpelier Avenue line. All of the old equipment of the company is being converted into one-man street cars. The service will be extended to all other lines as quickly as possible. The reconstruction of the cars was decided upon by the company in working out a plan whereby sufficient money might be saved and be applied to the paving of streets as provided for under the company's agreement with the city. To meet this requirement it became necessary to curtail operating expenses, L. A. Magraw, general manager, announced.

Will Hear Bus Petition for Niagara Falls.—Application has been made by the International Bus Corporation, a subsidiary of the International Railway, Buffalo, for a franchise to operate de luxe buses in the city of Niagara Falls as part of the proposed Buffalo-Niagara Falls interurban route to be established in the spring. The application of the bus company will be considered by the Niagara Falls City Council at a public hearing on Feb. 23. The company says it would charge a one-way fare of $1 between Buffalo and Niagara Falls. The fare between LaSalle and Niagara Falls would be 25 cents; Buffalo and Tonawanda or North Tonawanda, 50 cents, and the same fare between the latter two cities and Niagara Falls.

Power Issue to Higher Court.—The case of the Community Traction Company's rate for power against the Toledo Edison Company has been appealed to the Supreme Court of Ohio on error. Both Common Pleas and Appeals Court at Toledo have held against the city's contention that the case is one in which the Public Utilities Commission alone has jurisdiction. Present power rates represent a voluntary reduction from the original rates in effect for nearly 3 years under the Milner ordinance. The rate now is 0.9 cent per kilowatt-hour consumption plus a service charge of $23,000 a month. The original rate was 1.2 cents a kilowatt-hour. Through court action the city has sought to recover about $200,000 overcharges during the time the higher rate was in effect.

Railway Wins Cross-Town Bus Permit.—The Public Utilities Commission of the District of Columbia recently authorized the Washington Railway & Electric Company to operate a cross-town bus line between 37th and S Streets and 10th and E Streets, Northwest. The order stipulated that the rate of fare to be charged should be the same as the current rate of fare on street railway lines, except that transfers between cars and buses should be sold at the rate of 2 cents each and will be sold only upon the payment of 8 cents cash fare. The bus line was authorized to start on or before March 1, 1925. The railway company was also authorized to extend its present Potomac Park bus route. At the same time the application of the Washington Rapid Transit Company, which operates in the city of Washington and elsewhere in the District of Columbia independently of the railways, to supply cross-town bus service was rejected.

Insurance Policies Distributed.—For the third year, at Christmas, 1924, the Interstate Public Service Company, Indianapolis, Ind., distributed life insurance policies to employees who had been in the service a year or longer. The total amount of the policies distributed this past Christmas was $2,191,000 to 1,123 employees. Of this the company paid premiums on $1,134,600. The employees subscribed for an additional sum of $956,800, through a special advantageous arrangement made by the Interstate with the company writing the insurance.

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Financial and Corporate

$16,500,000 Atlanta Valuation Figure Questioned

The Georgia Railway & Power Company, Atlanta, Ga., will not accept the Beeler survey figure of $16,500,000 as the valuation of its railway property for rate-making purposes. This was indicated on Feb. 13 when officials of the company appeared before the special traction committee of the Atlanta City Council to push their contention that the valuation should be $24,094,708, or approximately $7,500,000 above the Beeler report figures.

Various evidences of the value of the company's physical properties as listed in the Beeler report are as shown in the following:

1. Historial appraisal as of Jan. 1, 1924, $13,054,004.
2. Foregoing adjusted to Jan. 1 price levels, less observed depreciation, $16,337,206.
3. Market value of securities, $16,164,023.
4. Capitalized net earnings under proposed plan of operation, $15,078,244.
5. Reproduction cost new less accrued depreciation, $16,252,109.
6. Reproduction cost new less observed depreciation, $17,495,581.
7. Reproduction cost new less accumulated reserve, $17,517,544.
8. Reproduction cost new, $19,515,720 .
9. Reproduction cost new less non-essential construction, $18,905,102.

The final judgment of the Beeler report was that a valuation of $16,500,000 should be set upon the property for rate-making purposes.

Preston A. Arkwright, president of the Georgia Railway & Power Company, in asking for a higher valuation of property, said:

> The Beeler Organization survey was made before jitneys were barred from the city. It took into consideration all traffic conditions, including jitneys. We think the valuation figure too low and are presenting our side of the question to the City Council, believing the actual physical value of the property to be at least $24,000,000 instead of the $16,500,000 given in the Beeler report.

J. L. McLendon, chairman of the special committee considering the seven points of the relief petition of the Georgia Railway & Power Company, stated recently that the committee will meet soon to consider other phases of the petition.

In connection with the valuation matter the Beeler report said that consideration had been given to all evidence tending to determine the original cost of construction of the present plant, the amount and market value of the bonds and stock of the company, the present as compared with the original cost of construction, the probable trend of railway construction costs in the future, the estimated earning capacity of the property under particular rates, the sum required to meet operating expenses, the age and probable useful life of the various items of the property, the exhaustion, wear and tear, obsolescence and inadequacy, the manner in which it has been maintained, the amounts expended for maintenance, the present operating condition of the property and the amounts accumulated on the company's books in the reserve for renewals and replacements.

It will be recalled that the ordinance virtually eliminating jitney competition with the railway was passed by the City Council and has now been approved by Mayor Sims. In addition to asking elimination of jitneys, other matters suggested in the relief petition of the company are: Increase of cash fares to 10 cents, tickets to be sold at the rate of 6⅔ cents each; 2 cents charge for transfers; reasonable revision of its operating routes; elimination of unnecessary stops; relief to the extent necessary of all gross receipts tax and relief to the extent necessary of all street paving charges.

Allows Partial Abandonment in Yonkers

The New York Public Service Commission issued an order on Feb. 13 consenting to the abandonment by the Yonkers Railroad of certain of its routes in the city of Yonkers. The commission disapproved the abandonment by the company of the Nepera Park line on Nepperhan Avenue without prejudice to a renewal of that application on changed conditions or further proof. Concerning the claim of the city that sums paid to the Union Railway for use of its tracks for intercity business were excessive, Commissioner Semple said that he was not convinced that these charges were excessive. He thought the contract fair to the Yonkers company and that if it were deemed fair by the Union Railway its continuance was very much in the public interest in giving convenient access to the station of the Interborough company by the Yonkers people. On the subject of bus applications Commissioner Semple said that he thought the company was entitled to the approval of its declaration of abandonment without regard to any applications either by the company or by other persons for consent of the Yonkers city authorities to the operation of buses on routes which might serve localities now served by the railroad and desired to be abandoned.

Refinancing Plan at Columbus, Ohio, Approved

The $25,000,000 refinancing plan of the Columbus Railway, Power & Light Company, Columbus, Ohio, as proposed by former President Charles L. Kurtz and amended at a special stockholders' meeting on Jan. 28, was passed by the stockholders at another special meeting held at Columbus on Feb. 10.

The amended plan gives the stockholders 6½ per cent per annum on the series B preferred and in exchange for each share of series B the holder will receive one share of the new and 25 cents. The holder of the present series A preferred will receive for every 100 share 105 of the new series A, which will provide the shareholder an income of 6⅓ per cent. All preferred stock will lose its voting power and the series B will have a retirement value of 110. Common stock will be exchanged on the basis of two shares for one.

It is pointed out that with the amendments to the Kurtz readjustment plan an additional $500,000 will be gained by the company.

Following the adoption of the refinancing plan, the stockholders decided to issue 30,000 shares of non-par common stock at $57.50, subject to the approval of the State Utilities Commission. In putting the new common on the market at 57½ and in giving holders two of the new shares for one of the old, the price of the common stock is kept at 115, the price paid by Cyrus S. Eaton, Cleveland, who recently secured a controlling interest in the Columbus company.

It was estimated that approximately $9,000,000 will be needed to provide for the growth of the power and light company during the present year. Included in this estimate is the cost of the new power station which is being erected 8 miles south of Columbus at a cost of $6,000,000. It is expected the new plant will be completed by next fall.

Surplus Increases on New York State Railways

A comparative statement of the earnings and expenses of the New York State Railways, Rochester, for the years ended Dec. 31, 1924 and 1923, was recently submitted by President Hamilton to the stockholders. The report follows:

SUMMARY OF OPERATIONS OF THE NEW YORK STATE RAILWAYS

	1924		1923
Railway operating revenues	$10,358,198		$10,800,517
Railway operating expenses (including depreciation)	7,257,744		7,708,178
Net revenue railway operations	$3,100,453		$3,092,339
Net revenue auxiliary operations	665		2,482
Net operating revenue	$3,101,119		$3,094,821
Taxes assignable to railway operations	711,305		797,121
Operating income	$2,389,814		$2,297,699
Non-operating income	125,071		76,868
Gross income	$2,514,886		$2,374,568
Deductions from gross income	1,478,478		1,451,177
Net income	$1,036,407		$923,391
Sinking fund appropriations	34,636		34,129
Dividends preferred stock	(5%) 193,125	(5%)	193,125
Earned on common stock	(4.05%) $808,645	(3.49%)	696,136
Dividends common stock		(2½%)	448,762
Surplus	$808,645		$247,374

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Steady Progress Reported from St. Louis

At the annual meeting of the United Railways, St. Louis, Mo., on Feb. 10 officers were re-elected. The reorganization committee reported the progress of its work to date and the adoption of the plan for the reorganization made public last November. The report of this committee was approved.

One of the next important steps to be taken by the reorganization committee is the securing of a new city franchise. This matter, however, will be permitted to remain dormant until after the municipal election in April. In that way the possibility will be avoided of injecting the franchise matter into the political battle.

A bill of complaint alleging that a number of prominent St. Louisans who have been or are connected with the United Railways as officers or stockholders mismanaged the company and its finances, with a resultant loss to other stockholders, was filed with the United States District Court at St. Louis on Feb. 9 by counsel for John B. Downing and Robert C. Delbridge, stockholders of the company. The bill asks that those complained against be held accountable for any losses the company may have sustained through the alleged mismanagement.

The traffic on the United Railways' lines aside from the Missouri Electric Railway fell off in January compared with the similar month in 1924. The gross receipts for the city lines in January approximated $1,571,000, against $1,683,000 in January, 1924. The Missouri Electric showed $11,000 against $14,000.

Interurban, Long in Receivership, Now Paying

An offer has been made to the preferred stockholders of the Buffalo & Erie Railway, Buffalo, N. Y., to exchange their preferred stock for the A and B stock of the International Utilities Corporation. The sponsors for the offer are Chandler & Company, New York City. As organizers of the International Utilities Corporation that firm recently took over the bonds of the Buffalo & Lake Erie, with all common stock, and issued 5 per cent preferred stock, amounting to 7,005 shares, in exchange. This preferred would now be exchanged for the shares of International Utilities on the following basis:

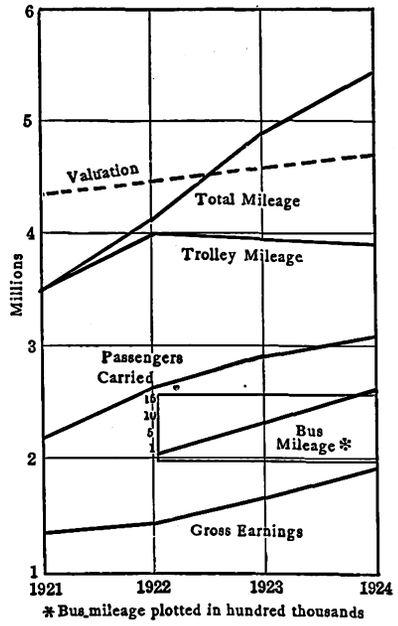
Each share of the preferred stock of the Buffalo & Erie Railway will receive one-half share of the Class A stock and one-half share of the Class B stock of International Utilities. The Class A shares are quoted in the market at around 47 and the Class B around 13.

The reorganization agreement that was submitted to the bondholders of the Buffalo & Lake Erie Traction Company, the predecessor of the Buffalo & Erie Railway, which has been in receivership since the bonds went into default in 1912, provided for the organization of two new companies, the Buffalo & Erie Railway and the Erie Railways.

Since taking charge last September, Chandler & Company have not only improved service on the traction lines, but through the adoption of one-man cars and the application of more intensive methods of selling have put the line on a paying basis. The Buffalo & Erie serve a population of 700,000. It operates 125 miles of track, with 41 miles over private right-of-way.

Youngstown Operates at Profit

For the first time since Jan. 16, 1919, when the service-at-cost franchise of the Youngstown Municipal Railway became effective, has the company shown a profit after paying all costs, and a 7 per cent return on the capital investment. This was in December, 1924. The actual profit was $187 for the 31-day period. Gross revenue for the month was $185,413. The operating cost was $185,413, divided as follows: $110,819, actual cost of operation;



*Bus mileage plotted in hundred thousands

Four-Year Record of Youngstown Operation

$45,435, cost of maintenance; $1,739, taxes; $27,418, return on investment.

While the actual surplus was only $187, the book surplus shows a profit of $2,575, placed in the stabilizing fund. This difference between the book profit and the actual surplus is the difference between $5,196 saved on the allowed operating expenses and the $7,585 expended for road improvements, a difference of $2,388. When this sum is subtracted from the book balance it gives the $187 surplus.

In the annual report, Dec. 24 has been marked as the biggest day of the year. This, Christmas eve, showed that 123,000 passengers were transported by the buses and trolleys. For the month of December 479,493 passengers were carried. Earnings per car-mile were 38.70 cents, while the operating costs were 38.66 cents.

For the year there was a deficit of $217,041 owing the Pennsylvania-Ohio Power & Light Company, the parent company. This is the difference between the amount allowed under the 7 per cent return ruling and the amount actually paid by the company. The return allowed under the franchise was $321,584, while the amount paid was $104,543. This deficit was added to the deficit which has accumulated during the last five years.

Gross revenue for 1924 was $1,909,908. The cost of operation was $1,262,388; cost of maintaining the lines, $447,612; taxes, $95,364; return on the investment, $321,584, leaving the deficit $217,041.

During the four-year period from 1921 to 1924 there has been a steady increase in the gross revenue, mileage traveled and passengers hauled.

Bus service was started in 1922. The valuation of the road has been increased from $4,406,071 on Dec. 31, 1921, to $4,760,327 on Dec. 31, 1924.

Sale of Portland Properties to Be Consummated

More than 29,000 shares of stock of the Cumberland County Power & Light Company, Portland, Me., have been deposited in acceptance of the purchase offer of Albert Emanuel Company, New York. Settlement will be made Feb. 16. The purchase price is $136.50 a share. Of the total of 30,000 shares, 16,000 were owned by E. W. Clark & Company, Philadelphia, and J. & W. Seligman & Company, New York. In accordance with the agreement for sale of these shares a similar offer was made to minority holders. According to the offer the purchasers reserved the right not to consummate the sale unless they secured 25,000 shares.

Reference to the offer of purchase was made in the ELECTRIC RAILWAY JOURNAL for Jan. 31, page 201. Included in the properties is the Portland Railroad, which operates 105 miles of city and suburban railway.

Pensacola Property Taken by Alabama Power Interests

Interests closely affiliated with the Alabama Power Company, Birmingham, Ala., have acquired the Pensacola Electric Company, Pensacola, Fla. Plans are under way for the extension of hydro-electric service from the Alabama company's system in South Alabama to Pensacola and other cities of North Florida.

The effect of the sale of the Pensacola Electric Company, it is believed, will be to make it an operating subsidiary of the Alabama Power Company. The Pensacola company is controlled by Stone & Webster. It operates 25 miles of electric railway. For some time the property has been under the direction of J. G. Holtzclaw as receiver.

TRAFFIC AND MILEAGE STATISTICS OF YOUNGSTOWN MUNICIPAL RAILWAY

Year	Earnings	Passengers	Car-Miles	Bus-Miles	Total Miles
1921	$1,463,352	21,703,998	3,579,532	.....	3,579,532
1922	1,491,095	26,337,168	4,010,067	112,901	4,122,968
1923	1,707,530	28,807,622	3,979,806	919,557	4,899,364
1924	1,909,908	30,526,353	3,885,882	1,511,091	5,396,973

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Auction Sales in New York.—At the public auction rooms of A. H. Muller & Sons there were sold this week 465 shares of collateral trust certificates of the Chicago Elevated Railway, Chicago, Ill., prior preferred participation shares, $37 lot.

Abandonment Application Turned Down.—The California Railroad Commission has denied the application of the Pacific Electric Railway for permission to suspend operation and remove the tracks of its Brockton Avenue line in Riverside, but has granted permission to the applicant to abandon service on the Seventh Street and Fairmont Park-Victoria Avenue lines. The railway alleged that the traffic did not warrant the expense of maintenance of the service and that the company was faced in the immediate future by the necessity of assuming heavy expense on account of paving. The commission found that the Brockton Avenue line was paying a small return and its abandonment would not be warranted.

Ottawa Electric Pays $279,075.—The directors of the Ottawa Traction Company, Ottawa, Ont., recently submitted their report for the year ended Dec. 31, 1924. This company owns the Ottawa Electric Railway, which operates the railway system in Ottawa. The amount received from the Ottawa Electric Railway during the year was $279,075, with which was paid the usual quarterly dividend of 1 per cent and a bonus of 1 per cent. The report states that 20 new pay-as-you-leave cars have been purchased and are now in operation. A great deal of track construction work was completed during the year. A large modern carhouse and repair shop, now under construction in the west end of the city, is expected to be ready for use early this spring.

$17,650,000 Debentures to Be Retired.—It is announced from Montreal, Que., that the Montreal Tramways will retire $17,650,000 of its debentures by exchanging them for 30-year general mortgage bonds. The first mortgage bonds, of which $21,351,000 are outstanding, will be closed at $25,000,000. Both steps are in connection with the plans to round out the company's financial structure.

Interurban Sold at Auction. — The Columbus, Newark & Zanesville Electric Railway, with headquarters and terminal at Columbus, Ohio, was sold at public auction at Newark, Ohio, on Feb. 3. The property consists of two divisions. The Columbus and Buckeye Lake division brought $400,000 and the Newark and Zanesville division $350,000, both figures being the minimum price fixed by the court. Howard C. Johnson bought the first parcel, and John C. Jones the second. Both buyers represent the bondholders. James R. Fitzgibbons, attorney for the company, said that after the reorganization has been effected, plans already made for improving the property would be carried out.

Office and Carhouse Sold.—The terminal and carhouse of the Trenton & Princeton Traction Company at West Hanover and Warren Streets and Chancery Lane, Trenton, N. J., has been sold to William A. Weinmann. Trolley cars will continue to use the terminal under a lease but the railway will erect an office and carhouse some distance from the center of the city.

Preferred Stock Offered.—A syndicate including Hambleton & Company, Baltimore, Md., is offering at $96 a share and accrued dividend yielding about 7.30 per cent 15,000 shares of the Southern Power & Light Company's cumulative participating preferred stock, no par value. The Southern Power & Light Company controls by ownership of all of the common stock the Louisiana Power Company, the Louisiana Power & Light Company, the Mississippi Power & Light Company and indirectly, through the Arkansas Light & Power Company, the Pine Bluff Company. The properties of the subsidiaries include 37 miles of electric railway.

Sale of Power Plant Arranged—The price at which the North Avenue power house in Youngstown, Ohio, is to be returned by the Youngstown Municipal Railway to the Pennsylvania-Ohio Electric Company has been agreed on at $600,000, the price paid by the city to the P-O when the city took over the plant. The power rate which the Municipal would have to pay the P-O after the station is returned has not been established because the two parties were unable to agree on the efficiency of the Pennsylvania-Ohio company's equipment which must be used in converting the city's power from alternating to direct current. It has been agreed to leave final decision in the matter of conversion equipment in the hands of chief engineers of the Westinghouse Company and the General Electric Company. They will be asked to submit figures on the new equipment such as would be necessary to convert to direct current the amount of alternating current required by the city.

New Directors Elected.—H. B. Voorhees, general manager of the Cincinnati division of the Baltimore & Ohio Railroad and Joseph B. Verkamp, clothing manufacturer, were elected directors of the Ohio Traction Company at the recent annual meeting of the stockholders. They succeed Bayard Kilgour and A. J. Becht, president and secretary respectively of the Cincinnati Street Railway. The Ohio Traction Company is the parent company of the Cincinnati Traction Company, which operates the street railway system in Cincinnati under lease from the Cincinnati Street Railway.

Bonds Being Offered.—The issue of $2,116,000 of first and refunding mortgage gold bonds of the Worcester Consolidated Street Railway, Worcester, Mass., referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 14, is being offered by Harris, Forbes & Company, Inc., Blodget & Company, Paine, Webber & Company and the Old Colony Trust Company of Boston. The bonds are selling at 97¾ and interest to yield 7 per cent. The coupon rate is 6½ per cent. The bonds are dated Aug. 1, 1910, and are due Aug. 1, 1930. The proceeds will be used to refund $1,771,000 of debt and to provide additional working capital.

Equipment Trust Plan Approved.—Authority has been granted the New York, New Haven & Hartford Railroad by the Interstate Commerce Commission to assume liability for $3,645,999 of equipment trust certificates to be issued by the First National Bank, Boston, covering the advance rental necessary to procure equipment, which will include: Thirteen electric motor cars, five alternating-current electric locomotives, two alternating-current electric switching locomotives, two direct-current electric switching locomotives and one gasoline-electric plough.

Stock Sale Sanctioned.—Approval of the sale of 250,000 shares of no par value capital stock, at $10 per share, by the Public Service Transportation Company, the bus service affiliated with the Public Service Railway, has been granted by the New Jersey Board of Public Utility Commissioners. The company will use the proceeds for the purchase of new buses and repay advances made to the corporation for purchases of buses.

May Make Offer for Company in Receivers' Hands.—Samuel H. Barker, representing interests which have not been named, may make an offer of $250,000 for the Frankford, Tacony & Holmesburg Street Railway, Philadelphia, Pa. The company was placed in the hands of receivers following such request in Common Pleas Court on Jan. 20 this year. At that time it was pointed out by petitioners for the receiver that unless prompt action were taken operation would cease. The company operates 17.29 miles of track, 1.11 miles of which are leased from the Philadelphia Rapid Transit Company. It owns 42 passenger cars.

Receiver Named.—Judge Sanderson of the Massachusetts Supreme Court recently appointed Franklin T. Miller, president of the Boston & Worcester Street Railway, Framingham, Mass., as receiver for the company. Plans for the reorganization of the company are under way, as noted in recent issues of the ELECTRIC RAILWAY JOURNAL.

One Mile Abandonment Allowed.—Approval of the Public Service Commission to the abandonment by the Westchester Electric Railroad of about 1 mile of its route in the villages of Bronxville and Tuckahoe, N. Y., was granted on Feb. 13. The order requires the company to remove at its own expense its track and overhead structure and restore the streets to good condition.

Interurban Operation Successful.—Profit from interurban operations offset a $24,500 loss for the Stark Electric Railroad, Alliance, Ohio, during 1924. During the year the city service showed a loss of $20,053 while the freight service showed a loss of $3,494. Receipts from interurban fares more than offset these deficits and placed a small fund in the treasury at the close of the year. During the 12 months 976,329 city passengers were carried and 2,076,812 interurban. Passenger cars covered 933,616 miles and freight cars 39,038. The Stark Electric Railroad operates from Salem to Canton, Ohio, a distance of 32 miles with city car service in Alliance only.

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Personal Items

Messrs. Thornton, Blair and Lindsay Advanced at Montreal

Kenneth B. Thornton has been appointed assistant general manager of the Montreal Tramways, Montreal, Que. This is a new office in the company, rendered necessary by increased pressure of work. Mr. Thornton will act as assistant to Lieut.-Col. J. E. Hutcheson, vice-president and general manager of the company. Mr. Thornton was formerly general manager of the Canadian Light & Power Company and the Quebec & New England Hydro-Electric Corporation and consulting engineer for the Montreal Tramways.

D. E. Blair, formerly superintendent of rolling stock, has been appointed general superintendent of the tramway.

A. M. Lindsay, formerly connected with the rolling stock department of the tramway, will replace Mr. Blair as superintendent of rolling stock.

Mr. Blair has been with the tramways for the past 21 years. He is now president of the Canadian Electric Railway Association. He has worked his way up with the company from a comparatively minor position. He started his career with the Quebec Street Railway. A portrait and a biography of Mr. Blair were published in the ELECTRIC RAILWAY JOURNAL for June 21, 1924.

No Successor Selected to Mr. Kurtz

No successor has been chosen to Charles L. Kurtz, who refused to let his name go on the nomination list for president of the Columbus Railway, Power & Light Company, Columbus, Ohio, at the directors' meeting on Jan. 27. Clarence C. Slater was named vice-president and general manager and has been acting in official capacity since the meeting.

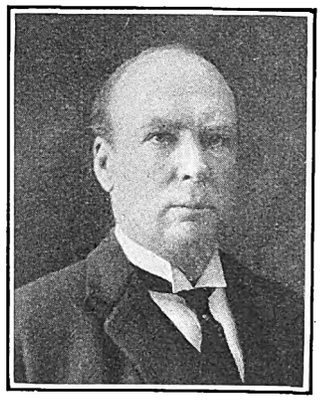
Frank T. Hulswit, president of the United Light & Railways Company, which through the United Light & Power Company secured control last August of the Continental Gas & Electric Corporation, which in turn has come into control of the Columbus Railway, Power & Light Company, declared on Feb. 10 that no one was being considered at the present for the presidency, although he said some one would be considered in the near future for this office.

Norman McD. Crawford, who resigned as vice-president of the company before the directors' meeting, effective on March 1, will stay until March 15.

A. L. C. Fell, until recently general manager of the London County Council Tramways, London, England, has accepted an invitation from the council of the Tramways and Light Railways Association to become a vice-president of that body. The invitation was extended to Mr. Fell as "a mark of sincere appreciation of his valuable services so long and so wholeheartedly placed at the disposal of the association." It will be recalled that Mr. Fell a few months ago retired from the managership of the London tramways on account of ill health. No permanent successor to him has yet been appointed, but the County Council recently constituted a sub-committee to consider the subject. Meantime J. K. Bruce continues as acting manager.

George William Allan New President at Winnipeg

George William Allan was recently elected president of the Winnipeg Electric Company, Winnipeg, Man. He is the senior partner in the law firm of Munson, Allan, Laird, Davis, Haffner & Hobkirk, Winnipeg. The firm of Munson & Allan was formed in 1882, and Mr. Allan has been an active member since that time. His firm was formerly general solicitor for the Winnipeg Electric Company.



G. W. Allan

Mr. Allan, who succeeds as president Sir Augustus Nanton, was educated at Upper Canada College, Galt Collegiate Institute, Trinity College School, and Trinity College University, and is a graduate of the latter. He was a member of the House of Commons for South Winnipeg from 1917 to 1921. For some years he has been actively associated with a number of companies doing business in western Canada, and he occupies the following among other positions: Director Canadian Bank of Commerce; member Canadian Committee of the Hudson's Bay Company; director Canada Permanent Mortgage Corporation; National Trust Company, Ltd.; Great West Life Assurance Company; the Northern Trust Company; the Northern Mortgage Company of Canada; the Canada Cement Company, Ltd.; Manitoba Bridge & Iron Works, Ltd.; Beaver Lumber Company; Home Investment & Savings Association; Guarantee Company of North America, and Beaver Fire Insurance Company. Mr. Allan was born at Moss Park, Toronto. He is a son of the late Senator G. W. Allan, P. C.

George W. Wells has been appointed vice-president and general manager of the Interstate Consolidated Street Railway and the Attleboro Branch Railroad, Attleboro, Mass., which have been taken over by Hemphill & Wells, New York City. Mr. Wells has long been connected with the street railway industry. For a number of years he was manager for one of the properties of Stone & Webster and before that was connected with the General Electric Company. He is a brother of Gardner F. Wells, one of the members of the firm that has taken over the roads.

P. C. Rideout has succeeded George M. Todd as superintendent of transportation of the Cumberland County Power & Light Company, Portland, Me.

H. B. McCune of Cleveland has succeeded Winchell G. Yates as superintendent of track and railway of the Wheeling Traction Company, Wheeling, W. Va. He was connected with Charles Clark, railway superintendent, previous to going to Wheeling.

F. H. Patterson has succeeded C. C. Bullock as superintendent of transportation of the Shreveport Railways, Shreveport, La.

F. S. Hunnewell, who has been superintendent of both the Interstate Consolidated Street Railway and the Attleboro Branch Railroad, Attleboro, Mass., has returned to the employ of the New England Investment & Security Company, Springfield, Mass., officers of which were also officers of the Attleboro properties. The two roads first mentioned were recently taken over by Hemphill & Wells, New York City.

C. F. Crockett has replaced V. M. Ake as secretary-treasurer of the Municipal Street Railway, Alexandria, La.

R. L. Clifford, formerly with the Toronto & York District, Ontario Hydro-Electric Railways, engineering department, has been appointed superintendent of the Peterborough Radial Railway, at Peterborough, Ont., which is operated as the Peterborough District, Ontario Hydro-Electric Railways, at Peterborough. He reports to W. R. Robertson, general superintendent of the Hydro-Electric Power Commission of Ontario's railways department, Toronto.

W. E. Bainhart has been appointed secretary of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan. O. S. Lamb is superintendent in charge of operation.

J. L. Puckett has replaced R. O. Bethea as electrical engineer and engineer of overhead construction of the Hattiesburg Traction Company, Hattiesburg, Miss.

J. W. Corbett has succeeded L. Va Voie as purchasing agent of the Canadian National Railways with offices at Toronto, Canada.

George R. Lunn, Schenectady, N. Y., former Lieutenant-Governor, has been nominated a member of the New York State Public Service Commission to succeed Oliver C. Semple, New York, whose term of office expired Feb. 1. The appointment is for a term of 10 years at a salary of $15,000 a year. Governor Smith has transmitted the nomination to the Senate for approval.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

$700,000 for Interurban Extension

The New York, Westchester & Boston Railway, New York City, plans immediate construction of a line to Larchmont Gardens and Mamaroneck at a cost of $700,000.

Contracts have been awarded to Dwight P. Robinson & Company for the construction and the two municipalities probably will be linked with the metro-urban early next fall. The New York, Westchester & Boston will finance the project without any assistance from the New York, New Haven & Hartford Railroad.

Upon completion of the enterprise the company will have upward of 80 miles of track in operation between its metropolitan terminals and 25 suburban communities. The next step in the New York, Westchester & Boston expansion program will be an extension to Harrison, Rye and Portchester.

The new construction will be double track, with freight and terminal sidings, steel and concrete construction and overhead grade crossings.

When the road ran its first trains the aggregate population of the seven largest municipalities it tapped was 137,000. Today the population approaches 230,000. The combined assessed valuations were $16,000,000. Today they are approximately $429,030,000. In a statement which he made L. S. Miller, president of the railway, said:

> The purposes of the builders of this road are looming toward fulfillment. Month by month the territory we serve is becoming more prosperous and more productive of traffic revenue.
>
> In our first full year of operation we carried 2,874,000 passengers. Last year we carried 10,000,000. In our first year we operated under a deficit, before taxes, of $1,000,000. Our 1924 report will show that we operated upon a credit, before taxes, of more than $530,000.
>
> Our facilities for increased service with the addition of more rolling stock to the present equipment are immeasurable. We could transport 100,000,000 persons this year without difficulty.
>
> The metro-urban is fast reaching the point where it will cease to be a liability to the New Haven and will become an important asset.

Brill Profits Smaller

For the year 1924 the combined output of the four plants of the J. G. Brill Company, Philadelphia, Pa., amounted in sales value to $8,721,726. The combined output for each of the past 7 years was as follows:

1918	$16,761,154
1919	14,210,622
1920	17,537,293
1921	7,647,898
1922	10,177,582
1923	18,167,486
1924	8,721,726

After deducting from earnings all cost of operations, including maintenance and repairs for the year amounting to $410,658, and after setting aside out of earnings reserves for depreciation of plant and equipment of $252,795 and for Federal and State income taxes, not yet due, of $92,310, the result of the operation of all the plants shows a net profit for the year of $577,761.

It is explained that development work undertaken in connection with gasoline-propelled cars for use on steam railroads progressed satisfactorily during the past year and that the management believes, from present indications, that this branch will show very satisfactory growth the present year.

CONSOLIDATED PROFIT AND LOSS ACCOUNT OF THE J. G. BRILL COMPANY AND SUBSIDIARIES FOR THE YEAR 1923 AND 1924

	1923		1924
Total net sales billed	$18,167,486		$8,721,726
Cost of sales, including operating, selling, administration and general expenses and depreciation for the year	15,525,021		8,212,337
	$2,642,465		$509,389
Miscellaneous income	101,937		160,681
Operating profit	$2,744,402		$670,071
Less reserves:			
For federal and state income taxes	$347,896	$92,310	
For special depreciation	150,000		
For development of gasoline-propelled vehicles	100,000		
	597,896		92,310
Net profit to surplus	$2,146,506		$577,761
Earned surplus at Dec. 31	$3,582,971		$4,985,196
Less:			
Adjustments of patents and good will	$199,670		
Miscellaneous adjustments—credit	16,499		
	183,171		*96,538
Add profit as above	$3,399,800		$4,888,657
	2,146,506		577,761
	$5,546,306		$5,466,418
Less dividends paid:			
Preferred	$320,600	320,600	
Common	240,510	240,510	
	$561,110		561,110
Earned surplus at Dec. 31	$4,985,196		$4,905,308

*Debit.

The amount of work on hand on Dec. 31, 1924, was approximately $4,250,000, compared with $3,500,000 on Dec. 31, 1923.

$10,000,000 Shop Development for Brooklyn

Plans for the construction of one of the most complete repair shops and yards ever devised for passenger train service have been completed by the Board of Transportation of New York City for the Brooklyn-Manhattan System. In connection with this development bids have been invited and received for the construction of the foundation for the main repair shop and the inclosure of the electrical repair shop at Shell Road and Avenue X, Coney Island. The several buildings when completed will embrace an area of 65 acres with floor space of 475,000 sq.ft., affording storage capacity for 1,000 cars and inspection pits for 64 cars, as well as wharfage facilities on Coney Island Creek. The plant when finished will cost approximately $10,000,000.

Seventeen contractors bid on the foundation work for the main repair shop and twelve contractors bid on the electrical repair shop inclosure. The total number of items in both jobs is 136.

The main repair shop building will be sufficient in its capacity and equipment to maintain in service and in a state of repair 3,000 steel cars of the type now in use on the Brooklyn-Manhattan Transit Corporation system. The main building of the proposed new group will contain machine shops, service shops, track assembly, motor and track shops, foundry and blacksmith shops, wheel and axle shops, carpenter shops, lumber storage, paint shops, cotton waste and oil storage and car washing stands.

The electrical repair shop soon to be inclosed will be for all motors and motor parts and for every electrical phase of motor and trail car used in rapid transit service.

The proposed improvement of the bulkhead and wharfage facilities on the shore of Coney Island Creek will provide for docking of scows, floats and barges from which to unload coal, rails, ties, timber and general freight for the maintenance and supply of the entire plant.

Mack's Bus Business Expanding

The Mack management is said to be devoting its entire energies and financial resources to the further expansion and development of its business, particularly in the bus division. Whereas in 1923 Mack was almost entirely a manufacturer of commercial trucks, its volume of bus business last year approached 20 per cent of the total, and at the rate of current expansion it is not unlikely that by the end of this year Mack's bus production will be close to the level of its truck operations.

Shipments of all classes of products for 1924 exceeded any previous years, and orders for December and January were in excess of any previous December and January in the company's history.

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Metal, Coal and Material Prices

Metals—New York	Feb. 17, 1925
Copper, electrolytic, cents per lb	14.50
Copper wire base, cents per lb	17.00
Lead, cents per lb	9.25
Zinc, cents per lb	7.77
Tin, Straits, cents per lb	57.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.45
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.875
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.25
Weatherproof wire base, N.Y., cents per lb.	20.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.15
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.1297
Turpentine (bbl. lots), N. Y., per gal	0.935

Rolling Stock

Coral Gables Utilities Company, Miami, Fla., has received three of the new cars to be operated between Miami and Coral Gables. The cars were built by the J. G. Brill Company and are of the same type as those used on the Miami municipal lines, but of slightly larger model.

Wisconsin Power & Light Company, Fond du Lac, Wis., has purchased four new buses of the parlor car type for use in Fond du Lac, Oshkosh, Waupun, Beaver Dam, Columbus and Madison.

Cleveland Railway, Cleveland, Ohio, has announced specifications of the 100 cars ordered last October. The plans for these cars were only recently approved by the City Council. The details of the cars follow:

Builder of car body	Cleveland Railway
Type of car	Front entrance, center exit, motor
Seating capacity	56
Total weight	41,140 lb.
Bolster centers, length	25 ft. 1 in.
Length over all	51 ft. 2 in.
Truck wheelbase	6 ft. 0 in.
Width over all	8 ft. 4¾ in.
Height, rail to trolley base	11 ft. 0 7/16 in.
Body	Semi-steel
Interior trim	Cherry
Headlining	¼-in. Agasote
Roof	Plain arch
Air brakes	Westinghouse DH-20
Armature bearings	Babbitt
Axles	4½-in. carbon steel
Bumpers	10-in. formed channel front, 6-in. rear
Car signal system	N-L indicating
Car trimmings	Brass
Center and side bearings	Cleveland Railway standard
Conduits and junction boxes	Cleveland Railway asbestos-lined sheet steel
Control	Westinghouse K35-G
Couplers	Tomlinson Form 8, Type A
Destination signs	Hunter front and side
Door operating mechanism	Cleveland Railway manual control
Fare boxes	Cleveland
Fenders	Eclipse Type C
Gears and pinions	Tool Steel, spur
Hand brakes	Independent equalizing
Heater equipment	Peter Smith
Headlights	Dayton pressed steel No. 1583-A
Journal bearings	Babbitt
Journal boxes	Symington, 1-F-9
Lightning arresters	Westinghouse MP.
Motors	Four Westinghouse 340, inside and outside hung
Paint	Cleveland Railway standard
Sanders	N-L No. 4 vacuum trap
Sash fixtures	Cleveland Railway new type
Seats	Longitudinal front, Brill & H-K rear
Seating material	Rattan
Slack adjuster	Anderson
Step treads	Kass
Trolley catchers	Eclipse Railway Supply
Trolley base	Nuttall No. 15
Trolley wheels	Cleveland Railway standard
Trucks	Brill 51-E-1 and 68-E-1
Ventilators	N-L type
Wheels	26-in. steel

Springfield Street Railway, Springfield, Mass., has ordered three Garford buses, each seating 21 passengers, for use on Union Street.

Georgia Railway & Power Company, Atlanta, Ga., has placed orders for the immediate delivery of 20 new, large and modern cars. These will be put into operation as the jitneys cease to run. It is also reported that the company will order 15 20-passenger buses.

Missouri & Kansas Railway, Kansas City, Mo., suffered the loss by fire recently of four motor cars and three trailers at the Strang line carhouse in Overland Park. The damage was estimated at $100,000. It is said that arrangements are being made to rent additional cars.

Citizens' Traction Company, Oil City, Pa., ordered during January from the Fageol Motors Company, Oakland, Cal., two six-cylinder buses of street-car type.

Track and Line

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., plans to double-track its 35th Street line from Clybourn Street to Wells Street, now a single-track line. As soon as this work is completed the 35th street line will be double-tracked along its entire length.

Worcester Consolidated Street Railway, Worcester, Mass., is considering the feasibility of including in its 1925 budget of expenses an appropriation for re-laying the car tracks on Park Avenue, Worcester. The cost will be about $100,000.

Lehigh Valley Transit Company, Allentown, Pa., plans to relocate its roadbed through Center Valley and Coopersburg, Lehigh County, and to Zion Hill in Springfield Township. The idea of the relocation was broached by the State Highway Department last summer when the latter made announcement of the building this year of a concrete highway from Allentown by way of Quakertown to Spring House. If the company had remained on the highway it would have been compelled to rebuild its lines and place them in the center of the road. By the time the new private right-of-way is built it will mean an outlay of nearly $500,000. The line will be a little more than 5 miles long, running from 300 to 1,500 ft. west of the present line. There will be ten crossings, eight at grade over lanes and two will be overhead.

Shops and Buildings

Puget Sound Power & Light Company, Seattle, Wash., has announced plans for a modern interurban train and bus station, to be located on Seventh Avenue and Olive Street to cost several hundred thousand dollars. The new terminal will be constructed around the west and south sides of the company's electric building. It will take the place of the present Everett interurban terminal on Sixth Avenue and Olive Street. The garage, storage yards and shops now occupying that portion of the Olive Street property between the electric building and the Everett station will be moved to a modern building to be erected on a site owned by the company on Lake Union.

Trade Notes

Pure Carbon Company, Wellsville, N. Y., has appointed the Simpson Power Equipment Company as its Cleveland representative with offices at 7016 Euclid Avenue. The Pure Carbon Company has also announced the opening of a Detroit office in the General Motors Building.

Key System Transit Company has ordered full automatic Tomlinson couplers for 130 cars. These will be used to equip 12 new cars and to replace the present couplers on 118 old cars.

Hale-Kilburn Company, Philadelphia, Pa., has recently appointed H. Barney Gengenbach, with the title of Western sales manager, to its office in Chicago. Mr. Gengenbach has been acting Western sales manager for a year or more, since the death of Harry R. Rochester.

Hyatt Roller Bearing Company, Harrison, N. J., announces that H. A. Brown, Jr., general manager of sales, has appointed P. C. Gunion, for 6 years advertising manager of the Hyatt company, to a place on the sales board. Mr. Gunion will also head up the market research activities in addition to his advertising work. The Hyatt sales board is composed of the general manager of sales and his assistant, the advertising and research manager and the three sales managers in charge of the automotive, farm machinery and industrial divisions.

New Advertising Literature

Ditzler Color Company, Detroit, Mich., has issued an attractively arranged and cleverly prepared booklet entitled "Motor Bus and Taxi-Cab Colors." The folder in its illustrations offers some new and distinctive color combinations particularly adapted to the bus field. In its reading matter it proves that color is a sales argument recognized in many lines of business.

Uehling Instrument Company, Paterson, N. J., has issued bulletin 118-A, describing the principle of operation of the Apex pneumatic CO_2. The indicator of this meter is actuated by changes in pneumatic pressure developed by dry absorption of the CO_2.

Sawbrook Steel Castings Company, Lockland, Ohio, in an illustrated pamphlet, has announced the full operation of its foundry in the production of "high grade electric steel castings."

General Electric Company, Schenectady, N. Y., has issued bulletin 44103.1, describing the 60-ton oil-electric locomotive which it developed along with the American Locomotive and Ingersoll-Rand Companies. Illustrations showing the locomotive in service, views of the interior and tables of operating data and specifications, as well as a general description, are included in the booklet.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, February 28, 1925 *Number* 9

Accurate Maintenance Costs Are Worth While

FROM a study of maintenance methods and practices in various shops, one is impressed by the lack of adequate cost figures. Questions regarding most of the technical phases of the work are readily answered, but accurate cost records are seldom available. This condition seems to be quite common except in some few shops where the master mechanic, apparently in sheer desperation, has set up a rough cost system of his own which enables him to judge to some extent in what direction he is headed.

Maintenance costs are collected in one form or another to compile the various accounts of the standard classification. The manner and degree to which they are utilized for the preparation of statements for the information of the maintenance departments determines whether or not this information becomes simply dead records or active guides and signals to direct the work of the maintenance forces.

The need for more detailed maintenance figures has been generally recognized. Last year a joint committee of the Engineering and Accountants' Associations prepared a tentative subdivision of the standard classification for the way and structures department. At the convention, however, this classification was questioned because it contained certain subdivisions to which it would be very difficult to make accurate charges. It was pointed out during the discussion of the report that it is difficult to get maintenance men to differentiate accurately between a large number of accounting subdivisions. This defeats the very purpose of the subdivision. It requires constant vigilance and supervision even to get charges made properly to the various accounts of the standard classification. An interesting pictorial guide made up by the Department of Street Railways of Detroit and described in the Aug. 16, 1924, issue of this paper, was devised to guide foremen and workmen in making such charges correctly.

There must be a definite purpose for an account subdivision to justify its use. Both in the shop and field it is important to avoid burdening maintenance forces with a top-heavy system of red tape. Mechanics should spend their time in productive work and not in keeping books or making out endless time tickets.

The need for detailed maintenance cost figures led to a decision to continue the work of the joint committee on engineering accounting, which is preparing a subdivision of the equipment group of accounts. This work might be carried still further to include a study of report forms designed to give the maintenance departments necessary cost information for their guidance in the most concise and intelligible form.

The extent to which subdivision is carried, and the form in which reports are prepared, should be determined by the concrete purpose for which the information is compiled. In the shop, for instance, the cost statements, to be of maximum value, would show on the one hand the relative maintenance cost for the various types of each major part of the car equipment. Thus if this cost for any particular class of equipment or important part becomes excessive due to obsolescence or imperfect design, the fact will at once be apparent. In the same way, the master mechanic who is manufacturing replacement parts in the shop should know from time to time the cost of the parts so manufactured in comparison with their market price. With changing conditions, such statements will show whether it is cheaper to manufacture the parts or buy them outside.

When new equipment is to be purchased, accurate records of past performances are invaluable as a guide in the selection of the equipment best suited to the needs of a particular property and a particular service. The cost of a few additional clerks is small compared with the savings that can be made.

All of this requires the supervision of men versed in the principles of cost accounting, and who at the same time are in touch with the maintenance forces and are familiar with their needs and their problems. In practically every railway organization of considerable size there seems to be a place for the engineer-accountant. He becomes the connecting link between the accountant and the maintenance forces so that their work may be co-ordinated to the end that the necessary cost information will be available in a form best adapted to guide the administration of maintenance work.

Modernizing the Shopman's Point of View

ONE subject that always arouses interest when equipment men get together is the improvement in machines and processes for lowering maintenance cost and making equipment more reliable. The men who make these economies possible have not received much attention. But the efficiency of a machine is no greater than that of the man who operates it, as was pointed out at the recent Dallas meeting of the Electric Railway Association of Equipment Men, Southern Properties. This was the keynote of a commendable discussion on the question: How can the shopmen best be educated so as to increase the efficiency of their work? Vocational training courses, the reading of technical books and publications, conferences and discussions on timely topics were suggested as some of the means to this end.

It is of little avail to re-equip a railway shop with modern labor-saving machinery if the point of view of the shop employees remains the same as it was

This is the issue in February that is devoted essentially to maintenance subjects

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20 or 30 years ago. Their thinking must be made as up to date as the tools they are using. There has been in the past too much of the "We've always done it this way" attitude. In most cases methods that were adopted in 1895 are as out of date in 1925 as a car built at that time would be today.

This need of modernizing the point of view of the men in the shops is now receiving considerable attention from railway managements. Opinions differ somewhat as to how it may best be accomplished. To a certain extent the method must depend upon the conditions in the particular shop where it is to be applied.

It is of primary importance, however, that the educational idea be properly "sold" to the shopman. A definite relation between the teaching and its results must be demonstrated. These men are not likely to be interested in ways to improve their minds simply for the sake of mental improvement. But they are intelligent men, and if they can be convinced that the educational program will make their work easier and better they will grasp the opportunity eagerly. The increasing attention being paid to this subject indicates that the electric railway industry will soon see a development in modernizing the shopmen's point of view similar to that which has already been made in modernizing the equipment in the shops of the more progressive companies.

Better Maintenance Will Reduce Noise in Car Operation

INCREASED attention is being given by electric railway officials to the problem of reducing noise in car operation. This can be considered as one of the details of modernization and will have a far-reaching effect in promoting better relations with the public.

Much of the noise in car operation is caused by parts which have been allowed to become loose or excessively worn. Loose truck parts, brake rigging, brakeshoes, and journal boxes, or worn motor suspensions, trolley wheels, springs, bearings, gears and pinions are parts that cause noise in operation. A second cause is the noise produced by impact between the car wheels and the rail. Such noises result from worn and corrugated rails, loose or broken joints, grit and dirt on the rails, flat wheels and wheels out of round. Moreover, jarring and vibrations from impact loosen car parts and eventually cause creaking at the body joints. Still a third major cause of noise is that originating in vibration of the operating and braking equipment itself.

Other factors contribute to car noises. Although they do not actually make the noise, they accelerate and transmit it instead of damping it. The susceptibility of parts to take up and transmit sound waves and vibrations introduces a problem in design that hitherto has not received great attention. Construction of track and roadway as well as of the cars themselves should be included. Surrounding buildings and equipment outside the track area sometimes add to the noise, on the principle of a sounding board.

The best way to reduce noise in the car equipment itself and in the track and roadway is by means of a higher grade of maintenance. Instead of keeping gears and pinions in service until they are worn so sharp that there is danger of breaking before they are removed, noise reduction requires that they be scrapped as soon as they wear to a point where excessive vibration occurs. The same principle applies to all wearing parts of car equipment. Bearings should be replaced more frequently than is the present practice. If any considerable reduction in noise is to be accomplished extreme wear must be prevented and definite limits of wear for the various wearing parts of car equipment should be established and should be enforced.

A special study of noises that come from car operation is being made by the equipment committee of the American Electric Railway Engineering Association. After the various causes for noises are classified and tabulated, it will probably be found that many of them can be relieved considerably by simple remedies. If, in addition to this, improved types of equipment be adopted and construction designed with the thought of reducing noise, much improvement will be accomplished.

$12,000,000 Saving Vindicates Milwaukee Electrification

AT LAST figures are available to prove the wisdom of the directors of the Chicago, Milwaukee & St. Paul Railway in adopting electric motive power for 650 of the 880 track-miles between Harlowton, Mont., and Tacoma, Wash. They have been criticised for their judgment in this matter because traffic and other conditions on these long-drawn out stretches of single track seemed not as favorable for large savings as those which existed in other parts of the country. It is all the more encouraging, therefore, to the proponents of judicious electrification of steam railroads that the financial showing is so good. This good showing results from a number of causes, among which the following stand out prominently: Abundant water power, as compared with the scarcity of good coal; heavy grades, on which the motors of the electric locomotives act as generators and thus save energy and brakeshoes; greatly lessened maintenance cost of equipment and reduced yard expenses.

All of these advantages have been reduced to a cash basis, for which figures are presented in a statement just made public. An abstract is published on another page. While the figures may not prove the wisdom of the construction of the line itself and the expansion of the Milwaukee into a transcontinental line, they show that in the circumstances, even on items that can be measured in dollars and cents, the conversion of the line to electric power was justified. In addition, of course, electrification has made riding more enjoyable, a good merchandising point for passenger traffic, and greatly reduced the danger that the railway might cause forest fires, a very important argument, especially in the State of Washington, where there is a great deal of valuable standing timber.

These and other incidental advantages are not enumerated in the article already referred to, but even without them the saving effected by electricity during the 9 years since the first division was put in service amounts to more than $12,000,000, after full allowance had been made for depreciation and interest charges on investment. As a whole, the figures are the most nearly complete of any made public giving the results from electrical operation on an electrically equipped steam railroad. May the example of the directors of the Chicago, Milwaukee & St. Paul Railway in giving out these detailed data encourage those of other electrified steam railroads to do likewise.

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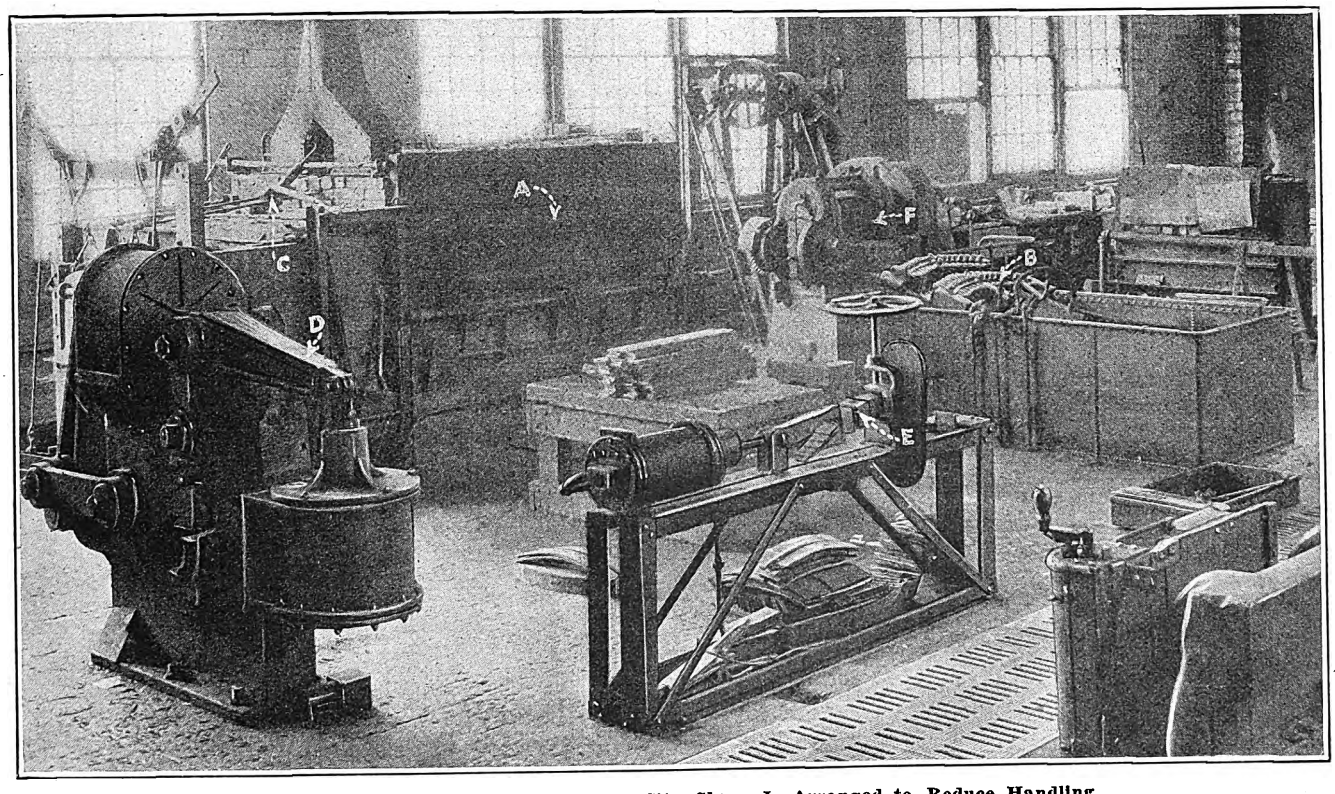
Maintaining Car Springs in Twin Cities

Proper Maintenance of Springs Is Considered to Be an Important Item in Improving the Riding Quality of Cars, Keeping Down Step Heights and Reducing Noise and General Wear and Tear on Equipment—Special Machine Equipment Results in Better Springs and Lower Cost



The Spring Department in the Twin City Shops Is Arranged to Reduce Handling

The leaves are first heated in the oil furnace, *A*, and after forming and quenching in the adjustable forming machine, *B*, they are tempered in the end of the furnace at *C*. Spring bands are made in the machine at *D* and are put on in the machine shown at *E*. In the background at *F* is the rolling machine for tapering the ends of the spring leaves.

THE maintenance of car springs is considered of so much importance by the Twin City Rapid Transit Company, Minneapolis, Minn., that special equipment and machines have been developed in the company's Snelling Avenue shops for the work. In this way the costs have been held down to a point which makes it possible to replace springs on cars at the first indication of weakness. This renders it unnecessary to keep in service springs that have sagged, as is done sometimes by the expedient of inserting wooden blocks to maintain clearance between the car body and the apparatus underneath. Provision of proper facilities for the economical repair of defective springs eliminates the necessity of economizing in this particular way and thereby results in steps being maintained at the correct height, while the noise and general wear and tear on the equipment resulting from imperfect springs are reduced.

One Man Handles Each Operation

Much of the machine equipment used for spring work in the Twin City shop has been developed to meet the specific requirements of an operating company's maintenance shop, and the methods in use enable comparatively small lots of springs to be put through at reasonable cost. All of this equipment is located in one section of the forge shop and is arranged with a view toward efficient use of a minimum number of men. One of the features of this arrangement is that practically every step in the work is carried out as a one-man operation.

Spring steel is purchased in bars of the proper dimensions for making the leaves of elliptic springs. Physical and chemical specifications assure a high grade of material. The first step in the shop process is to shear this material to the correct length. The cut pieces are next taken to a power-driven rolling machine, shown in an accompanying illustration, where the ends are tapered. They are then trimmed to exact length.

After being trimmed the leaves are ready to be formed to the proper shape for the finished springs. They are heated to 1,550 deg. F. in an oil furnace, described later, and are formed and quenched automatically in a machine shown in an accompanying illustration. This combined forming and quenching machine, which was developed in the company's shop, is designed so that it can be adjusted to form any shape of spring used on the various cars in service. The die is made up of a series of slotted dogs, each of

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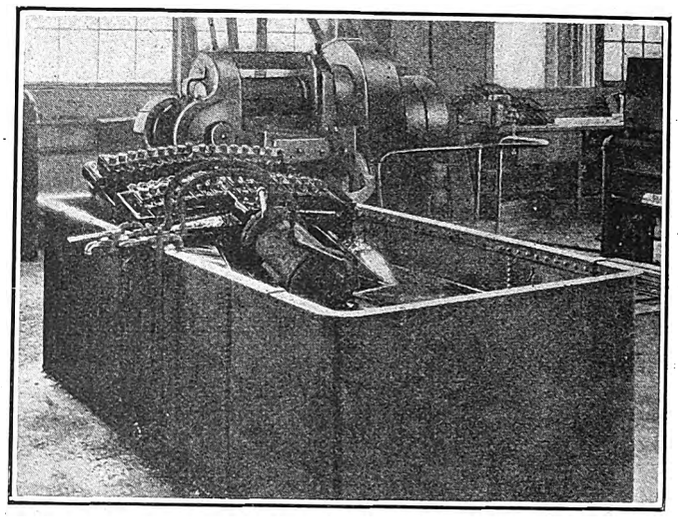
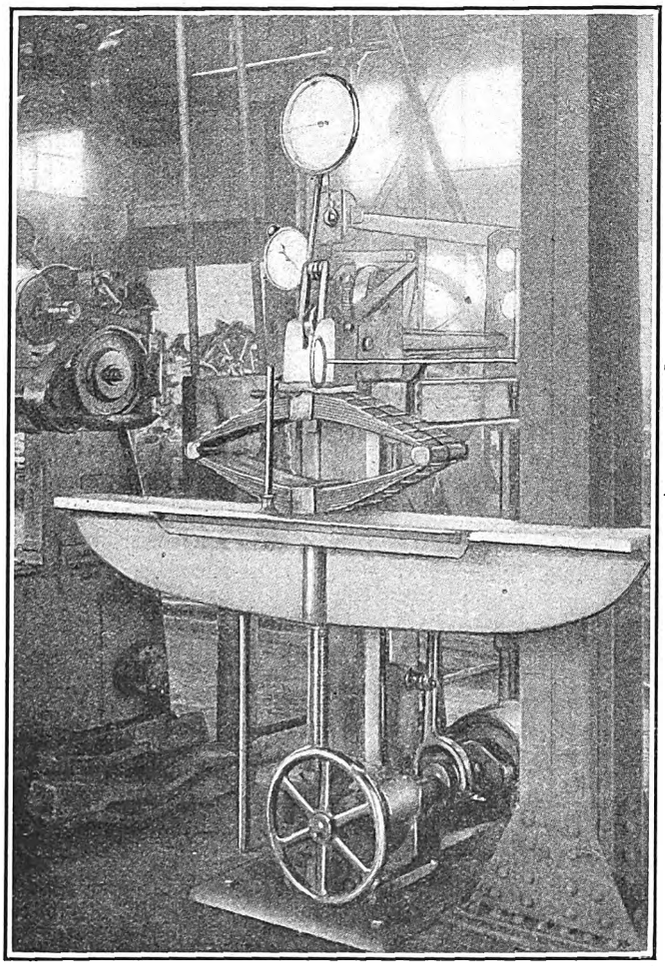
which is held in place by bolts. To form a leaf of any given shape, it is only necessary to set the dogs against a standard template made for the purpose, which is shaped for that particular leaf. Then the various bolts are tightened and the die is ready for use.

A die of this type is mounted on each end of a tilting table, which is supported in the oil tank shown in the illustration. An air cylinder in the center has a piston at each end, so that manipulation of the air valve causes the movable part of the die to be pushed out, first on one end of the table and then on the other end. The whole apparatus is so balanced on a central pivot that the change in the distribution of weight, caused by change in the position of the piston and dies as one is pushed out and the other pulled back, causes the table to tilt first to one side and then to the other. Tilting of the table submerges the die with the hot spring leaf at one end and raises the one at the other end.

In practice, two different leaves are put through simultaneously, one man handling the entire operation, including the heating. The die at one end of the table is set to form one of the leaves of a spring and that at the other end is set to form another. The proper material for these two leaves is prepared and a number of each type are put in the oil furnace. The two dies are then used alternately to run through the two lots of spring leaves. The capacity of the machine is fixed only by the time required for the steel to cool in the oil. While this is taking place, after each leaf is immersed, the single operator has time to attend to the pieces of material heating in the furnace. As the piston is moved out, first toward one end and then toward the other end of the table, the leaf in the end that is raised out of the oil is released. It is readily removed from the die and set on a dripping screen to drain, preparatory to the next operation.



A Close-Up View of the Forming and Quenching Machine
This shows the adjustable dies for forming the leaves to proper shape. The tilting table carries a similar die at the opposite end, which is immersed in the oil; as the operating piston moves first to one side and then the other, the two dies are alternately dipped in the oil. Two different spring leaves are run through alternately by a single workman.



All Springs Are Tested to Uniform Specifications in This Standard Spring Testing Machine

Leaves Heated and Tempered in One Furnace

After forming, the leaves are ready for tempering. This is done in another compartment of the same furnace in which they are originally heated for forming. The furnace is shown in an accompanying illustration. It is rectangular in shape and is so arranged that the doors at the front open into a compartment which is heated to about 1,550 deg. F. for the forming and hardening operation. These doors are convenient to the forming machine just described. The general arrangement is shown in the illustration. In the end of the same furnace another pair of doors open into a tempering compartment, to which the heat from the one burner is deflected, the temperature being adjusted by means of a regulating damper. In this way a saving in fuel is made, as the one burner serves two heating operations at widely different temperatures.

The tempering end of the furnace is divided into two sections, each fitted with individual doors. Thus the material in one compartment may be allowed to soak at the proper temperature while spring leaves are being withdrawn from the other. The tempering compartments are loaded in two layers, on gratings provided to increase the capacity. This furnace was furnished by the Mahr Manufacturing Company of Minneapolis and was specially designed to meet the requirements of this spring work. A suitable stack outlet for the tempering compartment draws off any gases that form and keeps them out of the shop.

When the formed spring leaves have been reheated to the proper temperature they are withdrawn by a workman who handles this end of the furnace and are individually fitted together while hot. They are then allowed to air cool.

Spring bands are forged in a commercial type of machine which is on the market for the purpose and

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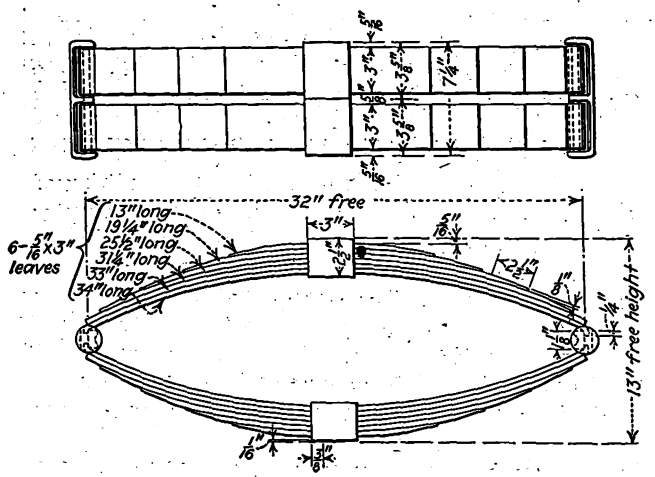


Complete Detailed Drawings for Each Type of Spring in Use Are Furnished to Shop Foremen for Their Guidance

WORKING LOADS

Deflection	Loaded Height	Load in Lb.	Car Load
2⅜ in.	10⅜ in.	4,000	Empty
3 in.	10 in.	5,000	Seated
4 in.	9 in.	7,200	Standing

which is shown in one of the accompanying illustrations. These bands are then placed on the springs, in a special machine designed and built in the shop. This is also shown in an illustration. It is designed so that the spring leaves are held together in a clamp mounted near one end of a light structural frame which forms the bed of the machine. At the other end is an air cylinder carrying a clevis that slides in a slot between two horizontal angle members. A pivoted shoe on the clevis is arranged to force the band into place over the spring leaves when air is admitted to the cylinder.

In practice, new material is added to elliptic springs only as required. Any of the old leaves that are not too badly corroded are retempered and used again. Thus the amount of new steel required is held to a minimum consistent with putting the springs in proper condition for service.

Testing the Springs

All guesswork has been eliminated in this work by the installation of a modern spring testing machine. From the standpoint of securing satisfactory and uniform results, this testing work is considered second in importance only to the tempering of the material. It is considered to be impossible to determine just what results are being accomplished unless proper facilities for testing are available.

Shop foremen are furnished with detailed drawings showing the exact dimensions of each type of spring in use. In addition, specific test data showing the working loads and allowable deflections for the different springs on various cars have been worked up and are furnished in convenient data sheet form to those in charge of the repair and testing of springs.

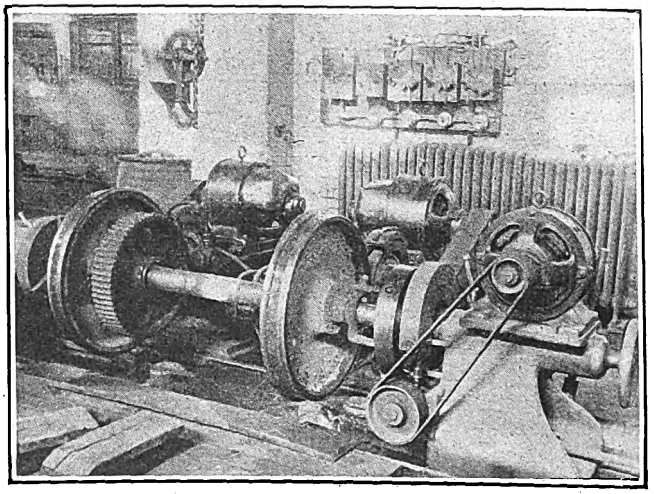
All springs going through the shop are tested for deflection under working load. A loaded height of ⅜ in. more than that specified is permitted, but a variation below the specified height is not allowed. Free height is determined after the maximum working load has been once applied and fully released. After this the permanent set is determined by again applying maximum working load and then completely releasing the spring a second time. The difference between the height after this second load is released and the original free height indicates the permanent set. This is not allowed to exceed 1/32 in. If, however, there is any permanent set (not exceeding 1/32 in.) the spring is again fully loaded and released twice, and must thereupon show no increase in the amount of permanent set.

Wheel Maintenance Practice in Denver

Pit Grinders Used for Truing Up Rolled Steel Wheels When Any Evidence of Wear Develops—Automatic Welder Builds Up Sharp Flanges

THE Denver Tramway has had considerable success in the use of automatic welding and grinding equipment in the maintenance of rolled steel wheels. The objective has been to minimize the amount of turning required so that as much as possible of the available metal of tread and flange will be actually useful in service, with resulting increased mileage for these wheels.

When this property adopted rolled steel wheels, the carhouses were equipped with pit-type wheel grinders installed for the maintenance of cast-iron wheels. Very favorable results have been obtained from these same grinders in maintaining rolled steel wheels. The practice is to true up wheels showing any evidence of worn flanges by running the car over the grinder and taking care of the situation before the wheels reach such a condition that they must be brought into the shop for turning. As a result, comparatively few wheels are turned, and this usually occurs only when it is necessary to match sizes of second-hand wheels for mounting them on a new axle. Besides the increased wheel mileage obtained by a reduction in the amount of turning, there is a substantial labor saving as a result of not having to take the wheels out from under the cars several times during their life.



When It Becomes Necessary to Send Wheels to the Shop, the Flanges and Treads Are Trued Up on the Grinder

Most of the carhouse grinding work is done when the cars are in the house during the non-rush hours. The average time per pair of wheels is about three-quarters of an hour. This figure is taken from the average for a month on four divisions, and includes the time of shifting cars, jacking and preparation for grinding, as

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well as the actual time involved in truing up the wheel. The object of the pit grinding being to catch the wheel as soon as it shows any evidence of wearing a sharp flange and to true up the flange and tread before the condition becomes so serious as to require the wheel to be taken out, the wheels are largely worn out in service and the average mileage obtained has been materially increased. At the present time, the average mileage for 31-in. nominal diameter wheels with 3-in. treads is approximately 125,000 miles per wheel.

The practice of grinding wheels at the carhouses has reduced considerably the amount of work done at the shop. At present one man in the shop, working only part time, performs all the wheel work which is done, and which formerly required two men working long hours in shifts. No wheel-turning lathe is considered necessary, and what little wheel turning is required is done on a large engine lathe that has been fitted up for this purpose.

A small proportion of the wheels develop sharp flanges when allowed to go too long without grinding at the carhouses. When this occurs these wheels are brought into the shop for welding and grinding. A General Electric automatic welding outfit, with single head, is used. The welding equipment and control panels were purchased from the manufacturer and the driving lathe was built in the company's shop. The lathe is equipped with individual motor drive and external gear speed control gears so as to rotate the wheels at proper speed for welding. The welding head is carried on a specially designed carriage which may be moved laterally on the bed of the machine and also has a screw adjustment for setting the head at the correct height.

This welding work is done in a compartment partitioned off from the remainder of the shop with corrugated sheet steel. An opening in the partition back of the welder allows the wheels to be moved readily in and out of the machine. This is closed by a large canvas curtain mounted on an overhead roller so that it may be raised and lowered readily. The general arrangement is shown in an accompanying illustration.

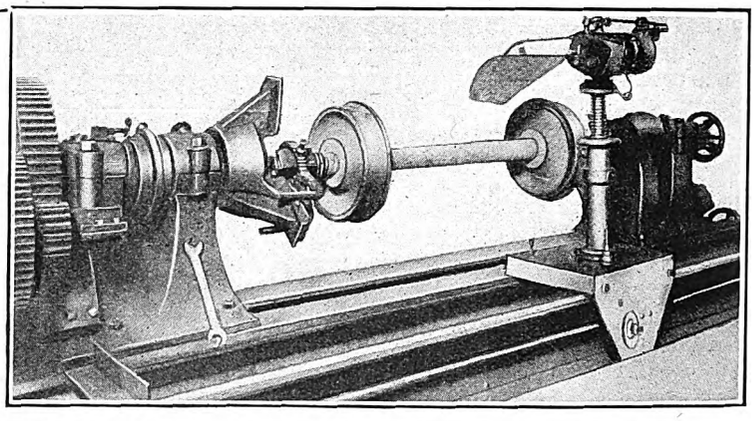
Welding Time Varies with Condition of Wheel

The time of welding varies with the condition of the wheel. Usually it has been found necessary to weld only one flange of a pair of wheels. An average thin flange on a 31-in. wheel is welded with the single head machine in about 2½ hours. The welding material is laid on with a current of about 225 amp. and with the wheel rotating at a peripheral speed of about 7 in. per minute. The wheels are cleaned in advance with a steel brush. No material is turned off the wheel and the welding material is applied with the flange just as it comes in to the shop. No difficulty from chipping of flanges has been experienced after welding. Before the installation of this outfit the welding was done by hand. In that case some difficulty from chipping occurred. No attempt is made to weld the tread.

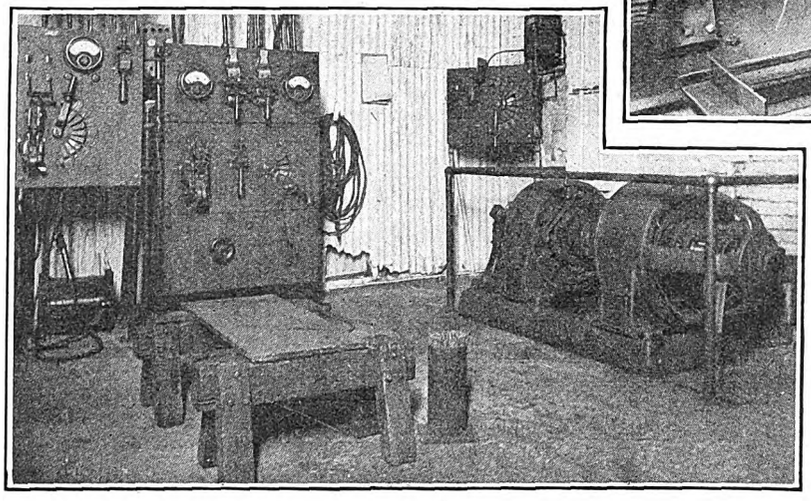
After welding, the wheels are set up in the shop grinder shown in an accompanying illustration. This is a number 0 machine made by the Springfield Manufacturing Company, Bridgeport, Conn., and has been found entirely satisfactory for this work. The time of grinding varies with the condition of the flange and tread. Usually, only one flange of a pair of wheels is welded, and then both flanges are ground and the tread trued up if necessary. The time of grinding in the shop varies from one-half hour to one hour per pair of wheels, and the work is done by one man, working only part time. An accompanying illustration shows the condition of a welded flange just after metal is applied and before grinding.

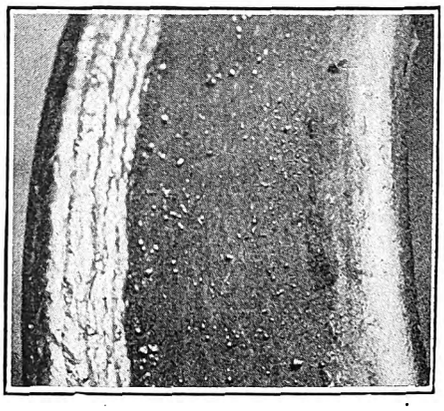
At Right, the Single Head Wheel-Welding Machine

This is made up from an old lathe bed with the automatic welding head mounted on an adjustable carrier. A canvas curtain mounted on an overhead roller covers the openings in the partition back of the welder, which permits wheels to be moved readily in and out of the machine.



Below, Miscellaneous Hand-Welding Work Is Done in the Welding Room, in Which the Automatic Machine Is Located





Condition of a Welded Flange Before Grinding

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Specialized Inspection Reduces Pull-Ins on Kansas City Railways

Designation of Certain Trained Men to Do Inspection Work Exclusively Has Resulted in Eliminating Many Street Failures—Cars Are Inspected Both Before and After the Work Is Done and Each Man Is Held Responsible for the Group of Cars Assigned to Him—Graphic Records Help to Check Performance

ADOPTION of what might be called specialized inspection methods by the Kansas City Railways has had a material effect in producing a simultaneous reduction in both maintenance costs and pull-ins chargeable to mechanical defects. This specialized inspection consists in so subdividing and standardizing the work that it can be carried out by specially trained men who have become highly expert inspectors and go over each car in accordance with carefully planned routine methods. This practice, together with that of working toward standard maintenance methods in the various carhouses and in the shops, the use of high-grade materials and a spirit of frank co-operation between the shop and the inspection carhouses have all contributed materially toward the favorable results accomplished.

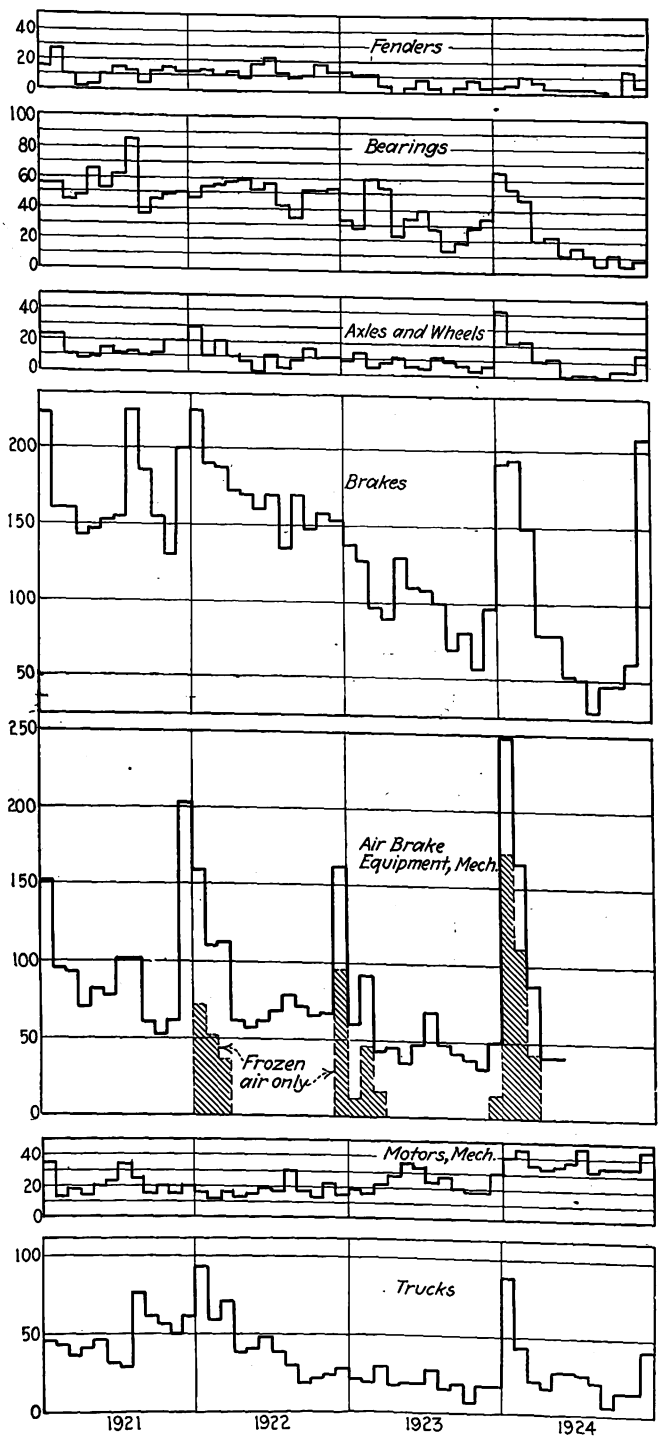
Foremen Have Regular Meetings

Foremen's meetings held on a regular schedule, in which a spirit of democracy is carefully cultivated, are considered to be no small part of the general scheme. Care is taken to avoid giving them the atmosphere of a series of lectures from the superintendent of the department. The men are encouraged to take part actively in frank discussion of any maintenance or operating difficulty that develops in the various carhouses and a particular effort is made to encourage the discussion of methods of improving the practices of the department.

Along with these meetings, a general open-door policy is maintained in the superintendent's office. Each foreman is encouraged to take a general interest in department activities. New policies and practices are freely discussed both in individual conferences and in the foremen's meetings. Full records of maintenance costs are made available to the foremen so that each may not only check up his own performance in comparison with the other men but may also be familiar with the results accomplished by the department as a whole. New ideas are checked up in advance by being discussed in the foremen's meetings. In this way the benefit of the experience of the men in actual contact with the maintenance work is obtained. If the new method is to be adopted, the co-operation of all the men is assured by making them entirely familiar with all of the factors connected with the adoption of the change in practice and the procedure to be followed.

Complete Motors Changed at Carhouses

At one time cars were brought to the shop for making wheel and armature changes. Subsequently it was found that this work could be carried out more economically by changing the wheels at the carhouses and by making replacements of complete motors when any



Defects Found on Air Brake Apparatus and Motors Are Divided Into Both Electrical and Mechanical Groups. Some of the Other Principal Subdivisions of Mechanical Defects Are Shown by These Curves. Unusually Severe Weather Encountered in January, 1924, Is Reflected in the Sudden Rise for that Month

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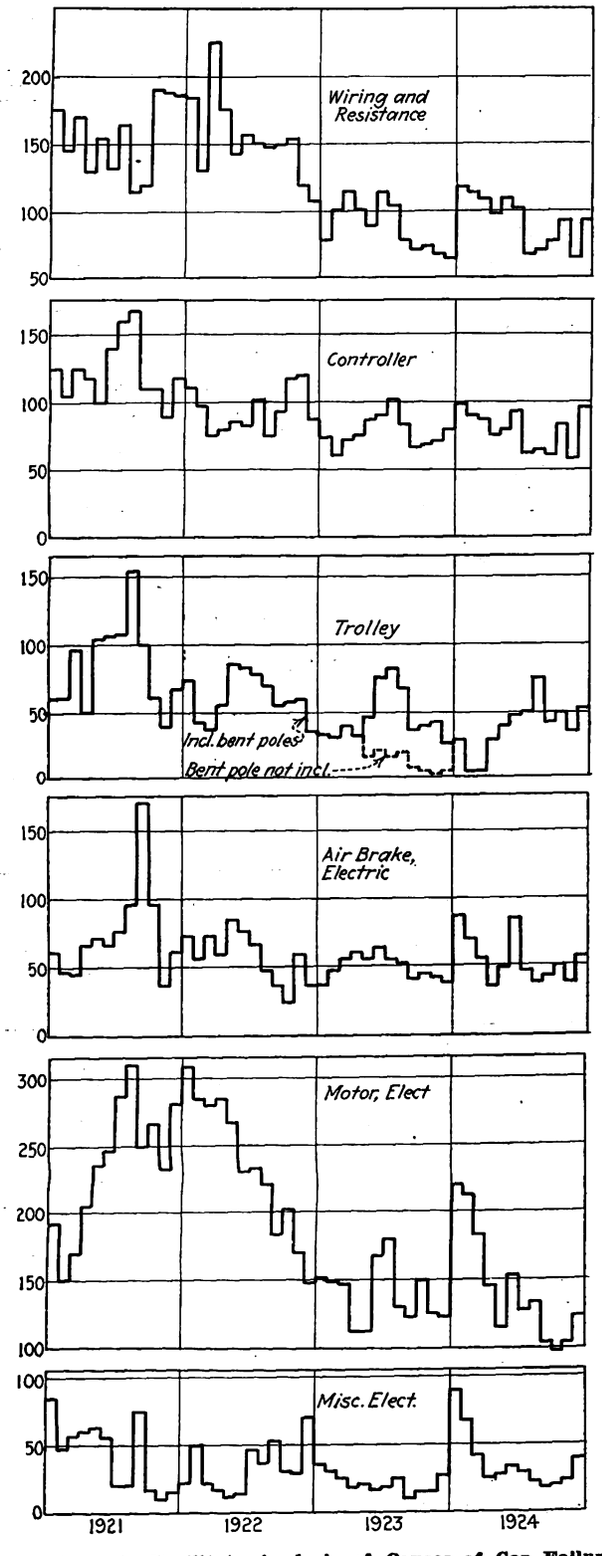
parts such as armatures, fields, bearings or pinions required repair or replacement. It was decided that the practice of changing armatures at the carhouses does not properly safeguard the condition of the fields and the fit of the end housing in the frame. It also creates a hazard through rough handling of armatures or bearings when they are shipped back and forth between carhouse and armature room.

It was found perfectly feasible and economical to ship the complete motors back and forth between shop and carhouses. Thus all motor work is concentrated in a group of specialists in the shop. A proper condition of fields is assured each time an armature is changed. Then, too, the practice gives a shop check of the axle bearing wear, and in a number of other ways helps to maintain the motor in the best possible condition. As each motor is brought into the shop the leads, fields and brush holders are inspected by shop experts. The fit of the end housing in the motor frame is carefully checked from time to time. Another result which has accompanied the practice of bringing all motors into the shop has been the elimination of shims of one kind and another, toward the use of which there is always a tendency when part of the motor maintenance is carried out in the carhouses, where insufficient tool equipment is available to enable worn surfaces to be properly built up and remachined.



Graphic Records Facilitate Analysis of Causes of Car Failures. Class A Pull-Ins Include Only Those for Which Mechanical Department Is Responsible. Subdivision of Electrical Defects Is Shown in the Above Curves

Less Work by Changing Complete Motors

After the adoption of the practice of sending complete motors to the shop, it was found that there is really less carhouse work involved in changing complete motors than in removing and replacing armatures, pinions and bearings at the carhouses. When the change in procedure was made the general overhaul period for cars was reduced to 50,000 miles in order to put the cars into the best possible condition by eliminating considerable deferred maintenance. As the cars were put in better condition the general overhaul period was gradually extended until it is now on an 80,000-mile basis. At these general overhauls the trucks as well as the car bodies are also completely gone over and put in first-class condition.

An important part of the general scheme for reducing pull-ins is the carefully worked out system of records which are compiled graphically in such form as to enable an analysis of the causes of pull-ins to be made. These records enable the head of the department to make comparisons of the results obtained by various divisions, and also of the troubles experienced with different types and classes of equipment. Examples of the method of subdividing pull-ins are shown in the accompanying illustrations.

A careful check is made through both the transporation and mechanical departments to make sure that car defects are properly reported. These reports are the basis for the pull-in records. In each operating carhouse is a division log book in which each trainman going off duty is expected to record any defects that come to his attention while operating the car for which he signs off. The trainmen also report these defects to the carhouse hostler or car shifter when the cars are brought in from service. The hostler makes out a ticket report in duplicate, one copy of which goes to the carhouse repair foreman and the other to the transportation department division superintendent.

Transportation Department Reports Failures

Transportation irregularities from any cause, including equipment failures, are reported over the transportation dispatching system telephones. These are summarized each day by the chief dispatcher in a daily transportation department statement. Each carhouse repair foreman also compiles a daily pull-in report from the hostler's tickets, indicating the cause reported for the pull-in and the exact condition found by the inspectors. The carhouse foremen also indicate on their reports the classification under which each pull-in should be grouped.

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Car No._____

KANSAS CITY RAILWAYS COMPANY

CAR RECORD CARD

Type _____ Weight _____ Type Motors _____ H. P. Motors _____ Trucks _____ Date Purch. _____

No. 1			No. 2			No. 3			No. 4		
DATES In	DATES Out	Armature Serial No.	Pinion Serial No.	DATES In	DATES Out	Armature Serial No.	Pinion Serial No.	DATES In	DATES Out	Armature Serial No.	Pinion Serial No.	DATES In	DATES Out	Armature Serial No.	Pinion Serial No.

DATES In	DATES Out	COMPRESSOR Type	COMPRESSOR Serial No.	DATES In	DATES Out	AIR MOTOR ARM Type	AIR MOTOR ARM Serial No.	DATES In	DATES Out	SHOP REPAIRS DESCRIPTION OF WORK DONE

Car No.....

DATES In	DATES Out	AXLE No. 1	GEAR No. 1	WHEEL No. 1R	WHEEL No. 1L	DATES In	DATES Out	AXLE No. 2	GEAR No. 2	WHEEL No. 2R	WHEEL No. 2L	CLASS "A" PULL IN RECORD DATE	CLASS "A" PULL IN RECORD NATURE OF FAILURE

DATES In	DATES Out	AXLE No. 3	GEAR No. 3	WHEEL No. 3R	WHEEL No. 3L	DATES In	DATES Out	AXLE No. 4	GEAR No. 4	WHEEL No. 4R	WHEEL No. 4L		

MISCELLANEOUS DATA

ITEM	REMARKS	ITEM	REMARKS
Controller		Motorman's Cab	
Circuit Breaker		Motorman's Railing	
Trolley Stand		Folding Steps	
Fender		Folding Doors	
Head Light		Sliding Doors	
Dest. Signs		Safety Air Valve	
Motorman's Valve		Brake Cylinder	
Air Governor		Braking Ratio	
Slack Adjuster			
Door Signals			
Door Engine			
Dia. Drawbar—Front			
Dia. Drawbar—Rear			

Above—Front Side of Car Record Card Shows Complete History of the Main Items of Equipment on Each Car. At Bottom—Back of Record Card Provides Space for Log Record of Pull-Ins and Shows Up Recurring Defects on Individual Cars

Copies of both the carhouse repair foreman's report and the transportation dispatcher's report are forwarded daily to the mechanical department office, where any discrepancies that may have occurred can be checked by a comparison.

As these pull-in records are received from day to day, the mechanical department office makes up a daily summary, classifying them into three main groups. The first, comprising what are known as Class A pull-ins, includes those attributable directly to failure of some part of the apparatus or equipment on the car. The second group, known as Class B pull-ins, includes cars pulled in for the same causes as those in Class A, but which are found O.K. when inspected. Cars pulled in for any other causes, in which the mechanical department is not directly responsible, such as damage from collisions, derailments, etc., are grouped into Class C. Any car which is taken out of service, because of defects of any kind, before completing its regularly scheduled service is classed in one or the other groups of pull-ins.

Each carhouse repair foreman carefully analyzes each case of pull-in and posts a record on the carhouse bulletin board indicating not only the results found by the inspection but also the man who was responsible for work on the defective car.

Most of the inspection work is done during the day. The inspectors report the conditions found, but do not actually make repairs themselves. This practice is followed in order to make the men more critical than would be the case if they made the repairs themselves. As a result of this specialization of the inspection work, the number of men required properly to supervise the condition of the cars has been reduced approximately 10 per cent. Each man thoroughly inspects approximately seven cars per day.

Two general inspectors report to the supervisor of the division mechanical forces in addition to the in-

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dividual carhouse foremen. These general inspectors have direct supervision of the inspectors in the various carhouses. This arrangement gives the individual foremen full charge of the labor forces in the carhouses, as well as the work which is carried on, but the inspectors do not report to these foremen for orders. The inspection forces are kept separate from the maintenance forces, but the work of both is co-ordinated through the supervisor of the division mechanical forces.

CARD RECORDS MADE FROM PULL-IN SUMMARY

A copy of the summary of pull-ins, made up in the equipment department office, goes to each chief inspector. He checks over the cases which involve equipment in his charge, and thereby supervises the work of the individual inspectors. Another copy of this report goes to the record room of the mechanical department for tabulation on the individual car card record, shown in an accompanying illustration. The records thus indicate any recurring defects on individual cars and give a ready check of the performance of individual inspectors assigned to those cars. Outstanding cases of repeated trouble, either on individual cars or on certain classes of equipment, are handled by memoranda sent out from the office to the carhouses, or are taken up for discussion in the carhouse foremen's meetings.

Form 612—10m—

DIVISION CAR INSPECTION

Car No. ..... Date ..... Division ..... Inspector .....

Trucks

Frame ..... Side and Center Bearings .....
Wheels ..... Axles .....
Brakeheads ..... Shoes .....
Journals ..... Splitcollars .....
Brake Rigging .....
Turnbuckles or Slack Adjusters .....
Hand Brakes .....

Motors

Armature Clearance .....
Commutators and Stringbands .....
Bearings ..... Pinions .....
Brushes ..... Gear Cases .....
Gears ..... Brush Holders .....

Air Equipment

Compressor ..... Brake Cylinder .....
Motorman's Valve ..... Governor .....
Safety Valve ..... Door Engines .....
Piping ..... Reservoirs .....

Car Wiring

Motor Leads ..... Compressor Wiring .....
Heaters ..... Lighting ..... Switches .....
Battery ..... Relay ..... Buzzer .....
Controller ..... Automatic ..... Fuse Box .....
Resistance ..... Lightning Arrestor .....
Trolley .....

Car Body

Register ..... Glass ..... Seats .....
Floors ..... Curtains ..... Signs .....
Fender ..... Paint ..... Roofs .....
Grab Handles ..... Stanchions .....
Doors .....
Steps .....
Remarks .....

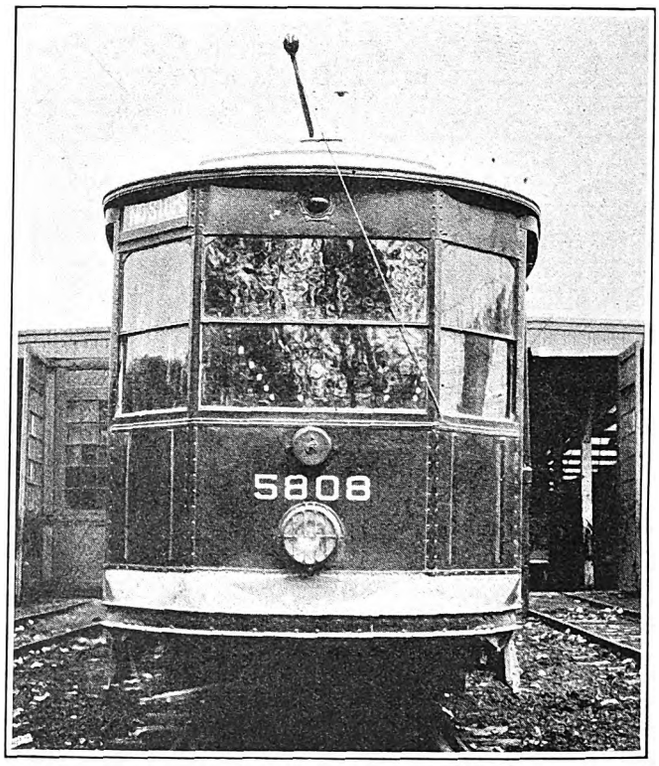
All Items Marked O. K. Have Been Repaired. Foreman .....

Date .....

Inspection Form Must Be Signed by Repair Foreman Before Car Is Released for Service. Each Car Is Inspected Both Before and After Repair

Steel Vestibule Window Posts Allow Broader Outlook

IN THE design of the latest light-weight one-man, two-man surface cars bought by the Boston Elevated Railway an innovation suggested by the legal department of the company has been incorporated. In order to give the least possible interference to the outlook of the motorman the vestibule window posts are narrow sections of pressed steel. All vestibule window sash is of metal, so that between the belt rail and the roof the end of the car is nearly all glass. This modification is expected to reduce materially the number of accidents. The appearance of the end of the car is shown in the accompanying illustration. In other respects these cars are the same as the light-weight one-man, two-man cars which have been in service on the Boston Elevated for several years past.



Narrow Window Posts and Metal Sash Have Increased the Vestibule Window Area on This Car

Emergency Equipment in Street Boxes

WRECKING and emergency equipment for use in the event of a car derailment or minor accident is provided by the City Railway in a number of substantial locked boxes located at various points in the business district of Dayton, Ohio. This equipment includes rerailing shoes, a heavy chain and a heavy-duty jack. A similar practice in New Bedford was described in this paper Jan. 17.

The boxes are kept locked to prevent tampering or theft but in addition to providing keys for authorized railway employees, keys to these boxes are also furnished to traffic officers on duty near the points where the emergency boxes are located. Consequently in the event of a disabled wagon, derailment or other accident that would cause delay in car schedules, emergency equipment is made available at the earliest possible moment, and bad delays are frequently avoided.

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Old Rail Used for Ties in Bangor

Rigid Reinforced Concrete Track and Paving Construction Is Employed—Wood Ties Are Alternated with Steel Ties, Which Are Welded to the Base of the Running Rail—Joints Are Thermit Welded

By E. W. Jennison
Engineer Maintenance of Way Bangor Railway & Electric Company

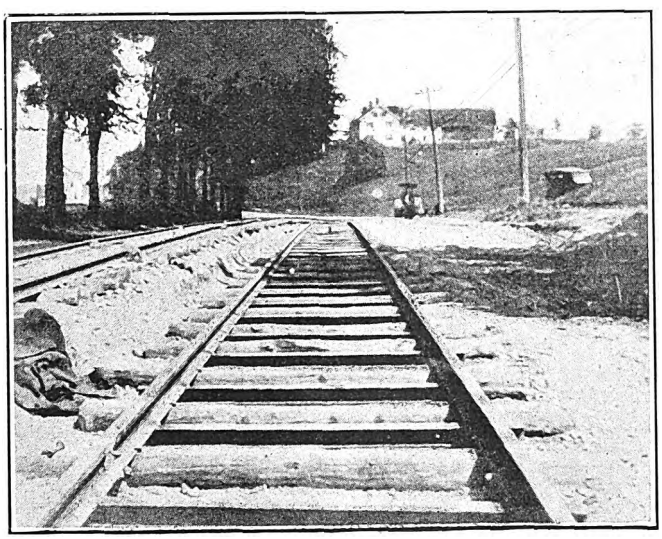
A TYPE of track construction in which old 60-lb. T-rail was used for ties has been quite extensively employed by the Bangor Railway and Electric Company. Placement of concrete in a single course between the ties and up to the head of the rail produced a rigidly reinforced structure.

Removal of Old Track

The old structure consisted of light T-rail, ranging in weight from 58 to 70 lb. per yard, laid on cedar or hemlock ties, spaced 20 in. center to center. Little or no ballast was used under the ties. The space between the ties and up to the top of the rails was filled with bank-run gravel or crushed-stone macadam without any binding material on the wearing surface. The rail was fastened to the ties with 5½-in.x⅝-in. drive spikes and the joints were of the four-bolt Weber type.

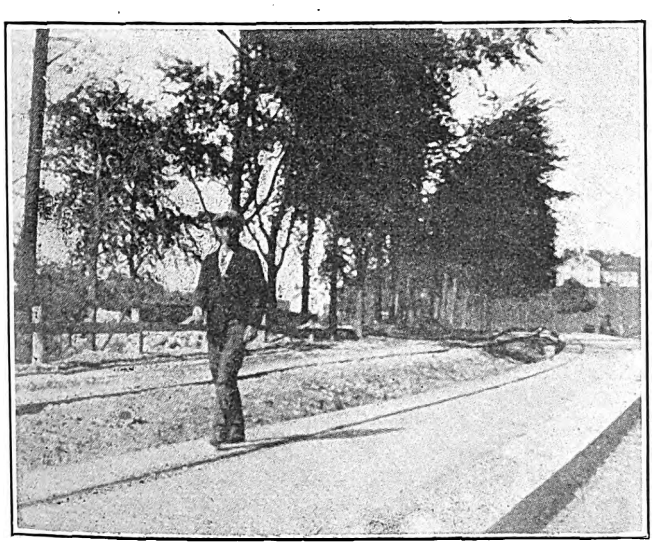
No traffic was maintained on the track under construction, even while the excavating was going on. In the case of double track, traffic was routed to the second track with Lorain Steel Company's portable crossovers built of 60-lb. stringer type of rail. In the case of single track, provided the rail itself was not to be changed, a temporary track was built alongside. If new rail was to be installed the old track was pulled to one side by a 5-ton Holt tractor and used as a temporary track.

A Russell special scarifier drawn by the 5-ton Holt tractor was first run over the track two or three times, with the teeth of the scarifier set low enough just to clear the tie tops. When a rail was straddled one tooth was removed from the scarifier. This loosened all material above the ties. Next, pockets were dug under the rails and the track jacked up, after which it was either pulled one side for temporary track or taken apart. This left the ground clear for completing the excavation under the most favorable conditions, which was done by loosening the material with a construction plow, tractor drawn, after which it was shoveled by hand onto flat cars and distributed on the shoulders of suburban lines. Excavating was to a depth of 15 in. below grade.

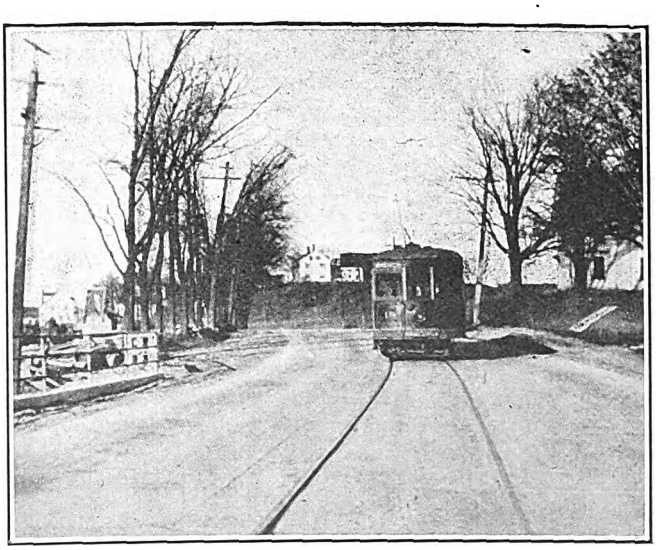


Joints Welded and Track Ready for Concrete

In nearly all cases there was no preparation of the subgrade except to level it off, the track slab resting on the natural soil, except that bank-run gravel to the depth of 4 in. was placed under the ties for use in tamping. Where seepage conditions appeared in the subgrade, trenches were dug below the frost line. The trenches were filled with rocks and tile pipe was then installed to drain to the sewer. The sub-



Track Slab Finished—Note Temporary Track



Appearance of Finished Concrete Pavement

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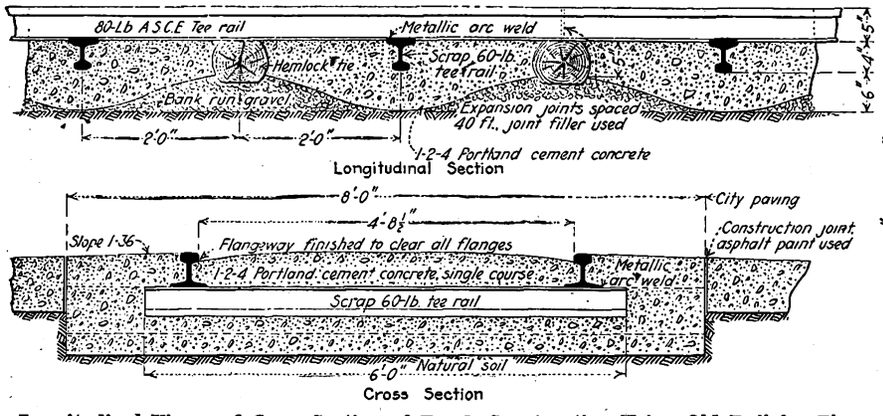
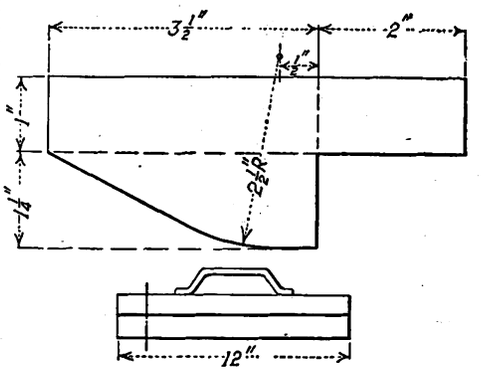
grade was not rolled, as the natural soil was already very thoroughly compacted.

Native hewn hemlock ties were laid out on the subgrade on 4-ft. centers. Between these were placed 6-ft. lengths of 60-lb. scrap T-rail to serve as cross-reinforcing members for the paving, the running rails serving as longitudinal reinforcing. The running rails were next laid and fastened with 5½-in.x⅝-in. drive spikes to the ties. Joints were made up temporarily with angle splice bars, using only one bolt. At this time the steel inserts used in thermit welding were placed between rail heads. Then the track was surfaced in the usual manner by hand tamping with shovels, using the gravel placed under the ties, and lined, after which thermit welds were made.



Longitudinal View and Cross-Section of Track Construction Using Old Rail for Ties

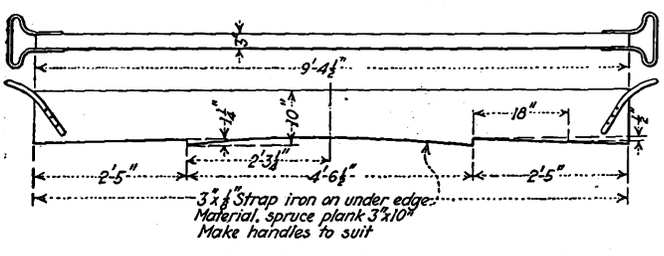


Flangeway Template for Concrete Paving

Cross-reinforcing members were lifted into place under the rail by means of small tongs and a chain on one end of a long lever. One man held the member in place while the welder spot welded it to the rail. The entire stretch of track under construction was covered in this manner and later the welder returned alone and finished the welding. This was done by the metallic arc process, using a Rail Welding & Bonding Company type B B dynamotor with ⅝-in. grade 30 steel rod. It required ½ lb. of steel rod per cross-reinforcing member. These cross-members take care of cross-bonding in a very thorough manner. After welding and just previous to pouring the paving the track was given a final surfacing and lining.

Concrete Is Poured in a Single Course and Hand Tamped

Actual paving was done by a city crew and mixer, although the railway paid the cost. This consisted of actual labor and material charges plus a rental of $20 a day for the mixer. Concrete was mixed 1-2-4 and was laid in a single course. Particular care was taken to have the mix dry enough and to have it thoroughly tamped under the rails and cross-members. Tamping under the rail was done by hand, using ordinary rail-way tamping bars, while the paving surface was tamped with a plank of the shape shown in the accompanying sketch. Final finishing of the surface was done by hand floats and the template shown was used as a guide in finishing the flangeway. Care was exercised that neither new nor worn flanges could hit the concrete. If this happens the finished surface of the paving is damaged and rapid disintegration caused by vehicular traffic will take place in the flangeway. After its initial set calcium chloride was spread on the pavement surface to hasten the final set of the concrete. After 10 days the track was opened to electric car traffic.



Concrete Tamper Used by Bangor Railway & Electric Company

Welds Ground Without Lifting Wheel

Grinding the welds is one of the most important steps in track construction where the thermit process is used, because if it is not properly done a cup may develop. The joints when welded were given a slight crown. When the paving had been poured 2 days the grinding of the welds was started. The running surface was ground with a Universal rotary track grinder and the gage side with a type M-8 flexible shaft grinder, both made by the Railway Track Work Company. The guides of the Universal were not warped. This, together with the joint crowning, allowed a perfectly flat cut, running off to nothing, to be made without lifting the grinding wheel. Particular care was taken on the first cut to hit only the high spot at the insert and at no time to force the grinding in the least. It was found that forced grinding left a high spot on the finished surface at the insert, which in a very few months showed bright and later caused a slight cup beyond.

A little more than 2,000 ft. of single track area 8 ft. wide, as shown in the accompanying drawing, was constructed during the 1924 season, in three separate locations, at a total net cost of from $5.97 to $6.68 per foot of single track. In the case of the low figure the rail was not renewed, the battered ends being cut off with an oxyacetylene torch. It is interesting to note that in this case the thermit welds consumed 12 per cent of the total net cost, whereas in the case of new rail the percentage was 6 and 7. The cost of the thermit welds was $9.95 each with old rail as against $6.70 with new rail. The largest of these three jobs contained only 51 welds, and it is reasonable to suppose that on larger jobs the cost per joint could be lowered. The paving cost ranged from $2.18 to $2.83 per square yard, which is approximately equivalent to a figure of $7 to $9 per cubic yard. Total labor charges were from $1.64 to $2.21 per foot of single track. Common labor was obtained at a cost of $3.50 per 9-hour day.

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Jigs Expedite Multiple Drilling

Variety of Operations Performed on Three-Spindle Drill in Columbus Railway Shop by Use of Proper Jigs

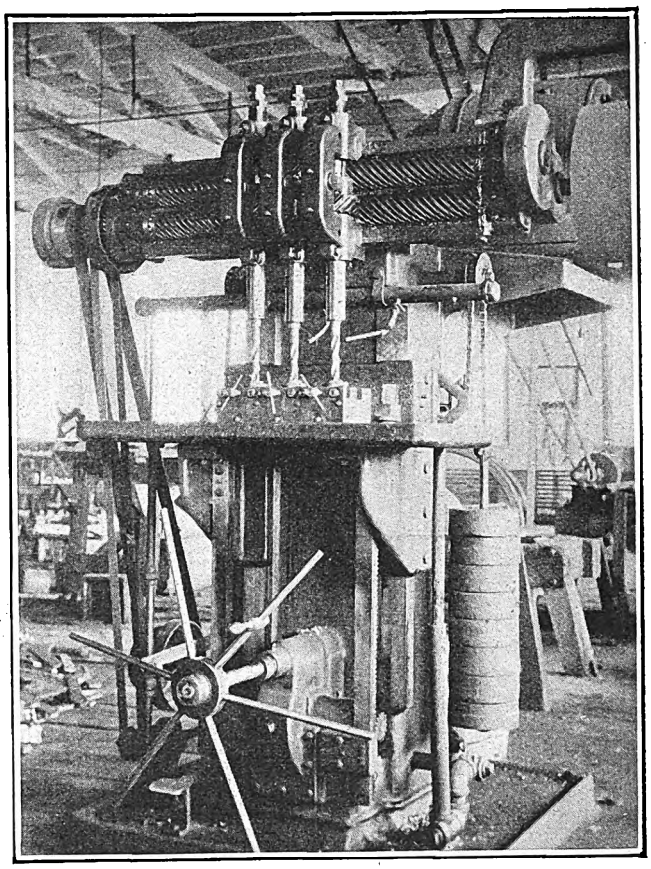
HOLES in brake levers, adjusting nuts and other similar parts are drilled three at a time in the repair shop of the Columbus Railway, Power & Light Company. The machine used, a Moline "Hole Hog," has proved particularly useful due to the jigs that have been designed and made in the shop for it.

The machine has three spindles mounted on a stationary crosshead. The table may be raised or lowered approximately 30 in. by hand or by power to feed the work to the drills. The spindle heads may be moved laterally the width of the table, which is approximately 30 in. Due to the width of the spindle head, the minimum center-to-center distance between adjacent drills is 5 in. The machine has a separate motor drive and a capacity of three 1¼-in. drills in 0.050 carbon steel.

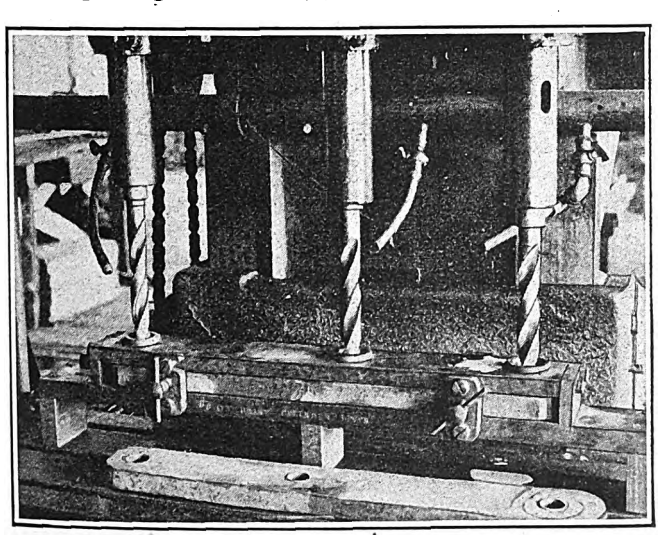
The three holes in brake cylinder levers and in truck brake levers are drilled at one operation. As used on this property, air-brake cylinder live levers are approximately 18 in. long and are made of 1-in. x 3½-in. steel. Two end holes in these levers are 1 7/64 in. diameter, while the center hole is 1 15/64 in diameter. The jig made for use on this job has a base of 1-in. x 3½-in. steel, mounted on three legs, one at each end and the third at the center of the base. The jig guide plate is mounted approximately 1 in. above the base, this being sufficient to allow the insertion of a brake cylinder lever blank. Two stops at the back and a pair of clamps at the front hold the lever in the proper position. These front clamps swing down out of position to allow the blank to be inserted and removed.

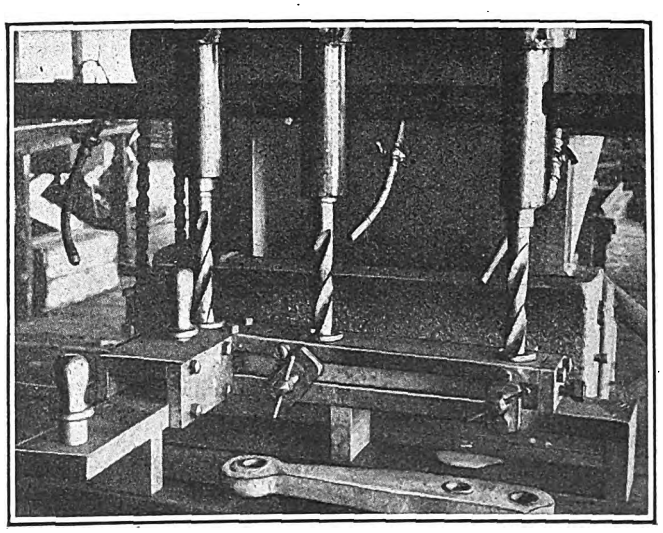
A different type of jig is used when drilling the three holes in a brake lever for a Brill No. 22 truck, in which two of the holes are located less than 5 in. apart. Consequently, it was necessary to make a special jig for drilling simultaneously two holes in one lever and the third in another lever, in order to work the machine at full capacity. This resulted in a jig of right-angle construction. The main portion, containing the bushed guides for two holes in the lever, is identical in construction with the jig used for drilling the air brake cylinder lever. However, at one end is a right-angle extension, which holds a second lever in a box-like holder. Two removable pins fit into the two holes drilled in the blank in the first position, thereby aligning it for the third hole. Thus after two holes have been drilled in the first blank of a given lot, it is possible to drill three holes at a time, one being drilled in the first lever while two holes are being drilled in another piece.

This jig is made up of a 1-in. steel base supported on four legs. The top guide plate, stops and clamps are similar in design and construction to those on the jig for air-brake cylinder levers. The main part of the jig is provided with an adjusting set screw for aligning the blank for the first two holes. This is shown in an



Various Drilling Operations Are Performed on This Moline "Hole Hog," for Which Numerous Jigs and Fixtures Have Been Made. It Is a Three-Spindle Drilling Machine with Individual Motor Drive





At Left, Simple Jig Holds Air Brake Cylinder Lever While Three Holes Are Drilled Simultaneously. At Right, Where the Holes Are Closer than the Minimum Spacing of Spindle Centers an Angle Jig Allows the Full Machine Capacity to Be Used by Drilling Two Holes in One Lever While the Third Is Being Drilled in Another

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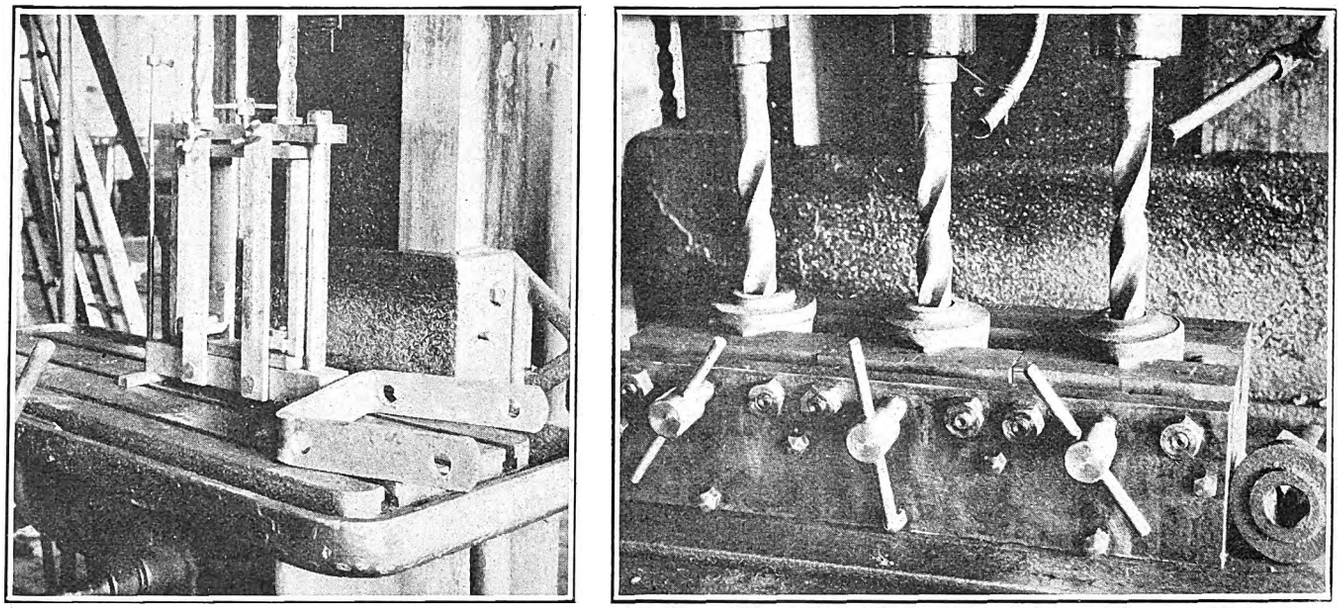


At Left, Two Holes Are Drilled in Each Side of Ash Grate Links While They Are Held in This Jig. At Right, Brake Rod Adjusting Nuts Are Drilled Three at a Time in This Simple Fixture

accompanying illustration, which gives an idea of the jig and also of the finished product.

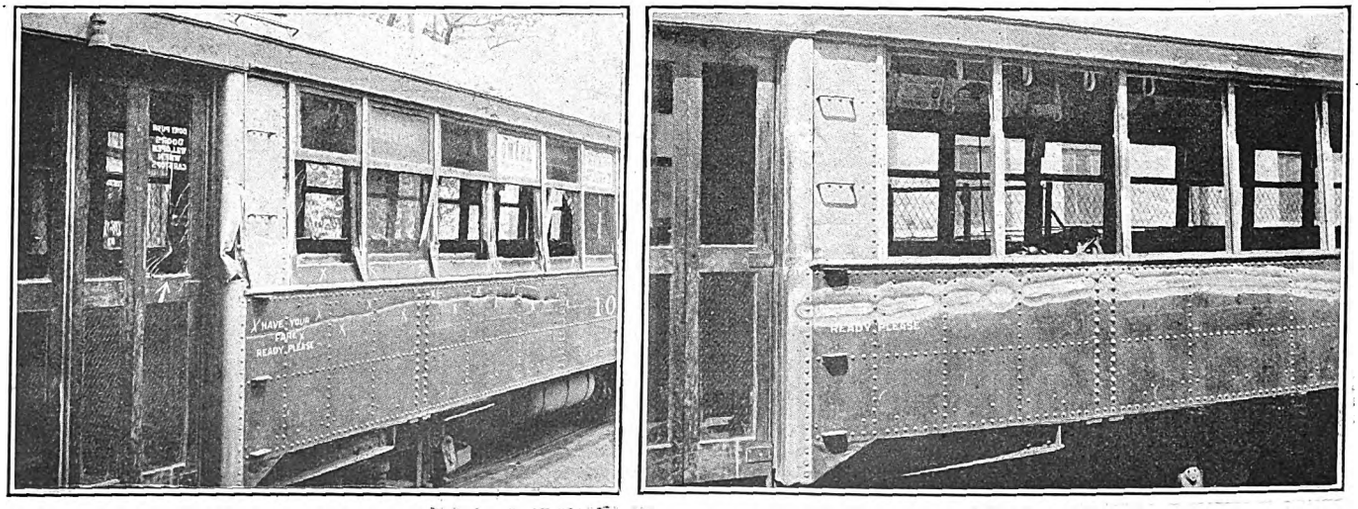
Another handy jig used in conjunction with the same machine is one for drilling grate links for the power house of the company. Although not a railway maintenance or replacement part, reference is made to it because this jig increased the scope of work that can be done with the drilling machine. The base of the jig is of such dimensions as to accommodate one side of the drag link. The top is similar and is mounted so as to allow room for the U-shaped link. On the back of the jig two uprights permanently fastened to the top and bottom members serve as stops for the blank. In front, two similar uprights are fastened so they can be swung out of the way when a link is inserted. Hardened bushings guide the drills which pass through the top member of the jig and also through two angle brackets fastened to the rear supports just above the lower leg of the link. Two long $\frac{15}{16}$-in. drills are used to drill the two holes through both the upper and lower sides of the link.

In addition to such jigs as those described, a variety of fixtures are also used in conjunction with the Moline machine. One of these, which may be taken as representative, is a fixture clamp which holds three brake-rod adjusting nuts for simultaneous drilling. This fixture has its bottom and sides made of 1-in. steel. The back and front of the fixture are held together by $\frac{1}{2}$ in. bolts, which serve as guides for the clamp portions of the fixture, which are moved back and forth by means of small hand screws in the front plate. The clamp jaws are cut out to engage the square shanks of the adjusting nuts. Three $\frac{15}{16}$-in. drills are used simultaneously with this particular fixture and the time of drilling the nuts is about one-half what it was when each nut was drilled separately.

Oxyacetylene Torch Used to Good Advantage in Omaha

IN THE shops of the Omaha & Council Bluffs Street Railway T. E. Wood, master mechanic, has found that careful study of the various types of repair jobs to which the oxyacetylene torch can be applied yields rich returns in reduced maintenance and repair costs.

An example of the large savings that can be made



An Oxyacetylene Torch, in the Hands of a Skilled Operator, Made Possible a Substantial Saving in Cost of Repairing This Damage
At left, the car as it came in after an accident. At right, use of the welder eliminated the necessity of removing the damaged side plate

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through the use of the torch in the hands of a properly skilled workman is brought out in the accompanying illustrations. In this case a glancing blow received by a car from a vehicle on the street cut a deep gash in the side girder sheet, tore a piece out of the steel corner post and also damaged the side posts.

Ordinarily, this damage would have called for a major repair job. To replace the side girder sheet it would have been necessary to tear out the interior trim of the car to get at the rivets. Drilling and fitting a new plate would have been far from a simple or inexpensive job. To have attempted to replace the corner post or the damaged side posts would have added increased work, delay and expense.

Skillful welding work accomplished the results shown in the second illustration. Extreme care was required to avoid buckling the thin side sheets under the heat action of the welding torch, but the success with which the job was carried out is clearly shown by the final condition of the plate as shown in the illustration. A similar welding operation on the damaged steel corner post and splices in the damaged side posts transformed what would ordinarily have been a costly job into a comparatively simple and inexpensive repair.

New Cyanide Hardening Process in Chicago Shops

Improved Process Provides for Heating the Cyanide Solution from the Top and Thereby Effects Substantial Economies in Cost and Eliminates All Danger to the Operator

A MATERIAL improvement in the cyanide hardening process in general use has been perfected in the forge shops at the West Shops of the Chicago Surface Lines by Charles Ringstrom, foreman of that department. This improved process not only assures uniformly good results but also effects material economies in cost and amply protects workmen against the dangers of inhaling cyanide fumes.

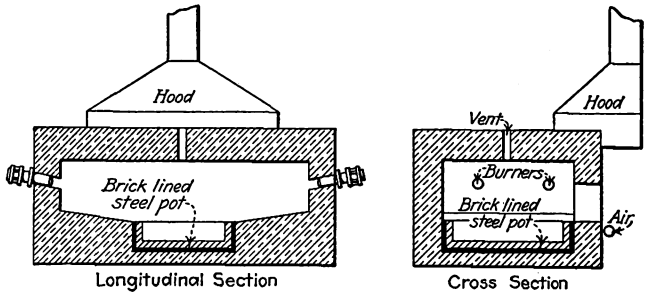
In the steel pot bath method of cyanide hardening, which is used by most steel treaters of the present day, the parts are preheated in a forge or furnace and then submerged in a pot containing the red-hot melted cyanide solution. They are then taken out and quenched in water. Although this method gives a uniform treatment to the part, it does not produce that glass-hard surfacing that cyanide is capable of imparting to steel where the entire process is carried through in one atmosphere and one temperature. Carbon steels case harden best at their critical temperatures, 1,500 deg. to 1,700 deg. F., due to the high affinity of iron for carbon in its second allotropic state. It is not possible to attain safely more than 1,450 deg. F. in a cyanide solution in a bottom-heated steel pot. In the newly developed furnace the cyanide pot is heated from above, and it is this idea that permits a combination of all the ideal conditions for the practical, safe and economical hardening of steel with cyanide base carbonizers.

The new furnace is of the oven type. The brick-lined steel pot is located in the center of the floor, which is laid with a 10-deg. rise from the pot to the side of the oven, as shown in the accompanying illustration. Uniform temperatures in the 1,500 to 1,800 deg. F. range are maintained by the four No. 3 Hyperbo gas burners. It was found, after many changes and tests, that this burner steadily delivered a finely controlled flame which maintains an even, uniformly circulated heat. Particular attention was given to the circulation current to confine their direct flow to a location above the cyanide solution in the pot, thereby maintaining a high temperature in the solution without agitation and consequent high volatilization.

All operations are performed inside the heat chamber. Large parts, weighing up to 12 lb., and small parts, down to ½-in. washers, are uniformly treated with equal facility in quantities up to 40 lb. per hour. The procedure is to place the parts to be treated on one of the inclined planes, where they are heated to 1,600 deg. F., then to submerge them in the cyanide pot for the required length of time, after which they are pulled out on the opposite incline plane, drained free of the solution and finally heated for penetration. They are then ready for quenching.

It will be noted that all operations are performed under a constantly maintained temperature, thereby insuring a very effective penetrative action; that the fumes from the cyanide mingling with the gas flames exclude all other air from the furnace, thus eliminating oxidation, and finally, that the liquid cyanide drains from the work into the pot after submerging, thus actually saving 50 per cent of the cyanide required for the same amount of work by the ordinary cyanide process.

The service life of the ordinary bottom-fired, pressed-steel cyanide pot is limited to a month or less. The corrosive effect of the cyanide solution, combined with heat, causes a rapid deterioration of the pot. The heating of the pot from the top, as is done in the new furnace, greatly diminishes the corrosive action of the solution on the container. After six months of operation the pot in this furnace, costing $4, was found to be as serviceable as when first installed.



This Sectional Diagram of the New Cyanide Hardening Furnace Developed in the West Shops of the Chicago Surface Lines Illustrates the Arrangement for Heating the Solution from the Top, Using Gas as Fuel

A record of production under the old and under the new processes shows the following results: For a period of 11 months, using the ordinary type process, 21,988 truck wear plates, each weighing 7 lb., were treated at a total cost of $6,629.26. This is an average cost of $0.0402 per lb. In the new process, under the same manufacturing conditions, miscellaneous parts weighing from one ounce to 12 lb. were treated during a 5-month period. In this case 69,500 lb. were treated at a total cost of $1,490.78, giving an average cost of $0.0214 per lb. of metal treated.

A material saving in the cost of steel pots is made with the new process, and it is conservatively estimated that 30 per cent of the carbonizing agent required in the common process is saved. There is a 50 per cent gain in the wearing quality of the metal treated. In addition to this, an operator produces 50 per cent more work during the 8-hour day with absolutely no danger of breathing cyanide fumes.

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Electrical Equipment Causes Big Saving

Comparative Data from the Chicago, Milwaukee & St. Paul Railway Show Definite Economy from Electrical Operation on Both Electrified Divisions, Though Traffic Conditions Differ Greatly

THIS week the Chicago, Milwaukee & St. Paul Railway made public for the first time detailed figures of the relative costs of operating its Rocky Mountain divisions by electricity and by steam locomotives. The report was prepared by C. E. Oliphant, assistant to the comptroller in charge of statistics, under the direction of W. W. K. Sparrow, vice-president, and in consultation with R. Beeuwkes, electrical engineer in charge of the electrical installation. The figures include both operating expenses and carrying charges (the latter including depreciation) and have been brought to the same basis. This was done for the operating expenses as follows:

The electrical operating costs are the actual costs for the year ended Dec. 31, 1923. The steam operating costs are based on the costs of the last year of steam operation, corrected where known to be incomplete as for some of the minor items, and then recalculated to cover the differences which have occurred in labor and material costs. In other words, the figures are restated so as properly to represent the price levels of 1923, or what the cost would have been if the divisions had been operated by steam. With regard to the savings with the electrical system through the use of regenerative electric braking, it was found that no existing data were available which would enable the brakeshoe wear to be determined with any accuracy for the condition of continuous and long application which, under steam operation, occurs on mountain grades. Therefore, a wear figure, believed at least to be conservative of 1 lb. of wear per 100,000,000 ft.-lb. of energy dissipated, was used. There is also a saving in draft rigging brake apparatus and wheel wear, all of which, for evident reasons, are indeterminable where cars move over many divisions. The amount of savings on account of these items was assumed to be the same as that resulting from the reduction in brakeshoe wear. This estimate is believed by the officers of the railway company to be conservative.

The comparisons of costs for the two motive powers are published in the accompanying tables and charts, the figures for which include only those accounts for both steam and electric operation which are affected by the type of motive power. Operating costs common to both steam and electric operation and carrying charges on investment in property commonly necessary to both forms of operation were omitted from these tables for the sake of simplicity.

The selection of accounts used was made after a careful study of the expenditures under each of the primary accounts of the operating classifications. Some of the accounts excluded as not being affected by change in power are without doubt affected to some extent by such a change, but the effect is so slight as to be negligible in comparison with the effects produced by other causes. Thus, "Maintenance of Track" is admitted by the company to be an expense unquestionably affected to some extent by the class or kind of power. It was felt, however, that the effect from other causes, such as weather, availability of money, cycles of renewal of parts, maintenance program, labor conditions, etc., are so much greater and so impossible of exact ascertainment for elimination, that this expense

SAVINGS RESULTING FROM ELECTRICAL OPERATION—COST LEVEL OF 1923

Years	Harlowton to Avery Electrical Operation began April and Nov., 1916		Othello to Tacoma Electrical Operation began March, 1920		All Electrified Sections	
	Volume of Traffic-Gross Ton Miles Frt. and Pass.	Net Savings by Electrification	Volume of Traffic-Gross Ton Miles Frt. and Pass.	Net Savings by Electrification	Volume of Traffic-Gross Ton Miles Frt. and Pass.	Net Savings by Electrification
1916	†1,639,054,000	†$ 1,098,166			1,639,054,000	$ 1,098,166
1917	2,677,097,000	1,641,369			2,677,097,000	1,641,369
1918	2,759,178,000	1,734,687			2,759,178,000	1,734,687
1919	2,894,063,000	1,888,037			2,894,063,000	1,888,037
1920	2,710,745,000	1,679,623	*691,674,000	* $249,003	3,402,419,000	1,928,626
1921	1,812,714,000	658,651	664,238,000	12,363	2,476,952,000	671,014
1922	2,109,868,000	996,485	734,121,000	103,301	2,843,989,000	1,099,786
1923	2,247,102,000	1,152,508	746,405,000	119,285	2,993,507,000	1,271,793
1924	2,129,426,000	1,018,721	691,476,000	47,808	2,820,902,000	1,066,529
Total		$11,868,247		$531,760		$12,400,007

†Tonnage and savings for 6¼ months.
*Tonnage and savings for 9 months.

OPERATING EXPENSES DIRECTLY AFFECTED BY CHANGE IN POWER—HARLOWTON TO AVERY

I.C.C. Accts.	Classification of Expenses Description	STEAM OPERATION Costs of the Year 1915 Adjusted to the Price Levels of 1923 *Variable Freight	*Variable Passenger	*Constant Frt. & Pass.	ELECTRICAL OPERATION Actual Costs of the Year 1923 *Variable Freight	*Variable Passenger	*Constant Frt. & Pass.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Maintenance of Way and Structures:						
201	Superintendence			$ 94,472			$ 95,208
231	Water Stations			23,800			
233	Fuel Stations			9,930			
235	Shops and Enginehouses			42,383			33,927
249	Signals and Interlockers			52,131			47,671
255	Power Substation Buildings						1,530
257	Power Transmission Systems						2,913
259	Power Distribution Systems						40,763
261	Power Line Poles and Fixtures						18,379
271	Small Tools and Supplies (for M. of Elec. Prop. only)						847
	Total Maintenance of Way and Structures			222,716			241,238
	Maintenance of Equipment:						
301	Superintendence			120,194			105,440
306	Power Substation Apparatus						10,163
308–11	Locomotive Repairs—Train	$ 687,824	$ 218,725		$ 190,390	$ 135,349	
308–11	Locomotive Repairs—Switch	37,105			12,510	77	
314–17	Brake Shoe and Rigging, Wheel and Draft Rigging Wear	21,352	11,622				
326	Trolley Maintenance Cars—Only						2,757
	Total Maintenance of Equipment	746,281	230,347	120,194	202,900	135,426	127,360
	Transportation:						
371	Superintendence			70,240			61,407
377	Yardmasters and Yard Clerks			17,055			17,055
378	Yard Conductors and Brakemen	61,533			27,174	166	
379	Yard Switch and Signal Tenders			1,189			548
380–81	Yard Enginemen—Yard Motormen	39,644			17,990	110	
382–84	Fuel for Yard Locos.—Yard Switch. Power Purchased	43,315					9,489
383	Yard Switching Power Produced						1,053
385	Water for Yard Locomotives	1,257					
386	Lubricants for Yard Locomotives	777			394	1	
387	Other Supplies for Yard Locomotives	808			302	1	
388	Enginehouse Expense—Yard	12,431			4,131	25	
389	Yard Supplies and Expenses			712			328
392–93	Train Enginemen—Train Motormen	400,421	121,341		231,352	77,778	
394–96	Fuel for Train Locos.—Train Power Purchased	886,009	270,693				754,231
395	Train Power Produced						87,135
397	Water for Train Locomotives	24,939	7,556				
398	Lubricants for Train Locomotives	14,534	3,360		9,979	4,811	
399	Other Supplies for Train Locomotives	19,018	5,381		4,831	2,470	
400	Enginehouse Expense—Train	142,283	66,330		42,341	40,531	
401	Trainmen	317,041	94,649		197,067	94,649	
402	Train Supplies and Expenses (Train—Light and Heat)					12,883	
404	Signal and Interlocker Operation			40,841			31,517
	Total Transportation	1,964,010	569,310	130,037	535,561	233,425	962,763
	Work Train Expense—All Other than included Above in M. of W. & S. adjusted to 1923 Work Train Miles			74,721			62,415
	Totals for Operating Expenses Directly Affected (Gr. Tot. Stm. $4,057,616; Gr. Tot. Elec. $2,501,088)	$2,710,291	$ 799,657	$ 547,668	$ 738,461	$ 368,851	$1,393,776
	Gross Ton Miles in Thousands—the Work Performed (Gr. Tot. Stm. 2,178,631; Gr. Tot. Elec. 2,247,102)	1,755,726	**419,905		1,827,197	419,905	
	Cost per 1,000 Gross Ton Miles	$ 1.54105	$ 1.90438		$ .40415	$ .87842	

*"Variable"—Expenses considered to vary practically directly with volume of traffic: "Constant"—Expenses considered to remain practically constant for all volumes of traffic within a reasonable range.
**The actual for the period, 354,054,000, adjusted to the tonnage of electrical operation as the difference rests solely in the number of cars per train: Expenses adjusted to conform.

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INVESTMENT IN AND CARRYING CHARGES ON THE PROPERTY PECULIAR TO EACH MODE OF OPERATION—HARLOWTON TO AVERY

ITEMS	Investment *	Carrying Charges: Interest 5%	Depreciation S. F. Basis 6%	Total
Steam Operation:				
Fixed Property:				
Fuel and Water Stations, Cinder Pits, Etc.	$ 630,000	$ 31,500	$ 16,695	
D. C. Signal System	‡			
Totals—Fixed Property	$ 630,000	$ 31,500	$ 16,695	$ 48,195
Locomotives:				
Freight (incl. all Pusher and Work Service Locomotives)	$ 2,470,628	$ 123,531	$ 28,165	
Passenger	356,039	17,802	4,059	
Switch	78,598	3,930	896	
Totals—Locomotives	$ 2,905 265	$ 145,263	$ 33,120	$ 178,383
Totals—Steam Property	$ 3,535,265	$ 176,763	$ 49,815	$ 226,578
Electrical Operation:				
Fixed Property:				
Roadway Buildings	$ 89,545	$ 4,477	$ 2,382	
Power Substation Buildings	535,157	26,758	3,361	
Power Substation Apparatus	1,859,353	92,968	21,383	
Power Transmission System	715,181	35,759	5,435	
Power Distribution System	2,890,615	144,531	23,269	
Power Line Poles and Fixtures	1,091,721	54,586	50,110	
A. C. Signal System	‡ 197,446	9,872	1,374	
Engr.—Int. during Construction and Misel.	325,671	16,284	3,354	
Maintenance Equipment	37,000	1,850	422	
Sub-Total	$ 7,741,689	$ 387,085	$ 111,090	$ 498,175
Rental of Transmission Lines—Credit		$Cr. 2,760		$Cr. 2,760
Totals—Fixed Property	$ 7,741,689	$ 384,325	$ 111,090	$ 495,415
Locomotives:				
Freight (incl. all Pusher and Work Service Locomotives)	$ 2,881,112	$ 144,056	$ 32,845	
Passenger	927,408	46,370	10,573	
Switch	111,564	5,578	1,272	
Totals—Locomotives	$ 3,920,084	$ 196,004	$ 44,690	$ 240,694
Totals—Electrical Property	$11,661,773	$ 580,329	$ 155,780	$ 736,109
Increase in Carrying Charges—Account Electrification				$ 509,531

*Electrical operating property at actual cost 1914-15-16: Steam operating property priced as of the costs obtaining during the same period (1915).
‡Net increase in investment chargeable to electrification included under electrical operation

INVESTMENT IN AND CARRYING CHARGES ON THE PROPERTY PECULIAR TO EACH MODE OF OPERATION—OTHELLO TO TACOMA

ITEMS	Investment *	Carrying Charges: Interest 6%	Depreciation S. F. Basis 6%	Total
Steam Operation:				
Fixed Property:				
Fuel and Water Stations, Cinder Pits, Etc.	$ 507,010	$ 30,421	$ 13,436	
D. C. Signal System	612,000	36,720	6,793	
Totals—Fixed Property	$ 1,119,010	$ 67,141	$ 20,229	$ 87,370
Locomotives:				
Freight (incl. all Pusher and Work Service Locomotives)	$ 2,135,785	$ 128,147	$ 24,348	
Passenger	430,231	25,814	4,005	
Switch	144,224	8,653	1,644	
Totals—Locomotives	$ 2,710,240	$ 162,614	$ 30,897	$ 193,511
Totals—Steam Property	$ 3,829,250	$ 229,755	$ 51,126	$ 280,881
Electrical Operation:				
Fixed Property:				
Roadway Buildings	$ 114,215	$ 6,853	$ 3,027	
Power Substation Buildings	452,808	27,168	2,875	
Power Substation Apparatus	1,476,964	88,618	16,985	
Power Transmission System	549,521	32,971	5,072	
Power Distribution System	2,190,401	131,424	16,822	
Power Line Poles and Fixtures	966,563	57,994	40,596	
A. C. Signal System	780,000	46,800	8,658	
Engr.—Int. during Construction and Misel.	621,519	37,291	7,645	
Maintenance Equipment	27,000	1,620	308	
Sub-Total	$ 7,178,991	$ 430,739	$ 101,988	$ 532,727
Rental of Transmission Lines—Credit		$Cr. 25,842		$Cr. 25,842
Totals—Fixed Property	$ 7,178,991	$ 404,897	$ 101,988	$ 506,885
Locomotives:				
Freight (incl. all Pusher and Work Service Locomotives)	$ 3,065,260	$ 183,917	$ 34,944	
Passenger	1,035,690	62,141	11,807	
Switch	48,520	2,911	553	
Totals—Locomotives	$ 4,149,490	$ 248,969	$ 47,304	$ 296,273
Totals—Electrical Property	$11,328,481	$ 653,866	$ 149,292	$ 803,158
Increase in Carrying Charges—Account Electrification				$ 522,277

*Electrical operating property at actual cost 1917-18-19: Steam operating property priced as of the costs obtaining during the same period (1918).

should be classified as not being affected by change in power, though other items in the primary account of maintenance of way and structures were included. Work train expenses have been separated and included as expenses directly affected by change in power for several reasons, one of which is that certain standby losses under steam operation are eliminated by the use of electric motors in work train service. The costs of the two periods have been adjusted to the same amount of work train service.

Costs of electric power for the electric division are based upon a minimum total payment corresponding to the respective amounts of energy for which the railway company had exercised options during 1923 for the different sections. Where these amounts were not sufficient to handle the increased traffic, the power cost was increased on the basis of the additional power required.

Cost as Affected by Volume of Business

Of course the total tonnage moved in the year selected was not the same for steam and for electric operation. Therefore, to make the comparison exact, the cost items affected by a change from steam to electrical operation were separated between those which within reasonable limits remain constant for different volumes of traffic and those which vary directly with the volume of traffic. The latter items were further separated between the passenger and freight services. With these separations, it was easy to make a comparative statement of figures on investment and depreciation based on the same tonnage. In determining the figures on investment, only the power equipment facilities and appurtenances directly related to each system of motive power were considered.

In tabulating the investment in the property involved,

OPERATING EXPENSES DIRECTLY AFFECTED BY CHANGE IN POWER—OTHELLO TO TACOMA

I.C.C. Accts.	Classification of Expenses: Description	STEAM OPERATION Costs of the Year, August, 1918, to July, 1919, inclusive, Adjusted to the Price Levels of 1923: *Variable Freight	*Variable Passenger	*Constant Frt. & Pass.	ELECTRICAL OPERATION Actual Costs of the Year 1923: *Variable Freight	*Variable Passenger	*Constant Frt. & Pass.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Maintenance of Way and Structures:						
201	Superintendence			$ 48,295			$ 49,777
231	Water Stations			8,273			
233	Fuel Stations			5,215			
235	Shops and Enginehouses			16,234			12,513
249	Signals and Interlockers			33,202			31,343
255	Power Substation Buildings						2,047
257	Power Transmission Systems						5,179
259	Power Distribution Systems						19,723
261	Power Line Poles and Fixtures						11,088
271	Small Tools and Supplies (for M. of Elec. Prop. only)						365
	Total Maintenance of Way and Structures			111,219			132,013
	Maintenance of Equipment:						
301	Superintendence			31,105			22,306
306	Power Substation Apparatus						7,891
308–11	Locomotive Repairs—Train	$ 326,467	$ 129,174		$ 78,549	$ 60,703	
308–11	Locomotive Repairs—Switch	24,141			2,658		
314–17	Brake Shoe and Rigging, Wheel and Draft Rigging Wear	18,000	7,000				
320	Trolley Maintenance Cars—Only						714
	Total Maintenance of Equipment	368,608	136,174	31,105	81,207	60,703	30,911
	Transportation:						
371	Superintendence			35,097			34,126
377	Yardmasters and Yard Clerks			6,708			3,268
378	Yard Conductors and Brakemen	40,560			10,038		
379	Yard Switch and Signal Tenders			2,047			578
380–81	Yard Enginemen—Yard Motormen	25,629			6,396		
382–84	Fuel for Yard Locos.—Yard Switch. Power Purchased	24,763					2,714
383	Yard Switching Power Produced						447
385	Water for Yard Locomotives	602					
386	Lubricants for Yard Locomotives	506			105		
387	Other Supplies for Yard Locomotives	526			44		
388	Enginehouse Expense—Yard	6,845			1,186		
389	Yard Supplies and Expenses			314			62
392–93	Train Enginemen—Train Motormen	233,323	69,674		92,224	38,095	
394–96	Fuel for Train Locos.—Train Power Purchased	493,807	186,446				**319,634
395	Train Power Produced						53,301
397	Water for Train Locomotives	11,710	4,548				
398	Lubricants for Train Locomotives	5,606	1,758		4,804	2,171	
399	Other Supplies for Train Locomotives	7,211	2,778		3,485	1,999	
400	Enginehouse Expense—Train	45,959	29,252		14,554	16,127	
401	Trainmen	264,338	60,644		107,183	47,698	
402	Train Supplies and Expenses (Train—Light and Heat)					7,723	
404	Signal and Interlocker Operation			19,248			14,380
	Total Transportation	1,161,385	355,100	63,414	240,019	113,813	428,510
	Work Train Expense—All Other than included Above in M. of W. & S. adjusted to 1923 Work Train Miles			50,452			39,676
	Totals for Operating Expenses Directly Affected (Gr. Tot. Stm. $2,277,457; Gr. Tot. Elec. $1,126,852)	$1,529,993	$ 491,274	$ 256,190	$ 321,226	$ 174,516	$ 631,110
	Gross Ton Miles in Thousands—the Work Performed (Gr. Tot. Stm. 1,014,511; Gr. Tot. Elec. 746,405)	805,830	***208,681		537,724	208,681	
	Cost per 1,000 Gross Ton Miles	$ 1.89865	$ 2.35419		$ .59738	$ .83628	

*"Variable"—Expenses considered to vary practically directly with volume of traffic: "Constant"—Expenses considered to remain practically constant for all volumes of traffic within a reasonable range.
**Constant up to a total of 906,007,000 Gross Ton Miles for Freight and Passenger Services; thence increased in freight service as estimated necessary for greater volumes of traffic: (The amount to be added at 1,014,511,000 G. T. M. is $38,307.00.)
***The actual for the period, 186,232, adjusted to the tonnage of electrical operation as the difference rests solely in the number of cars per train due to difference in train routing: Expenses adjusted to conform.

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the same practice was followed as with the operating expenses, namely, to include only the equipment facilities and appurtenances directly related to each type of equipment. For example, in steam operation, the steam locomotives and the fuel and the water stations were included, and in electrical operation the locomotives, the transmission and distribution systems, substations, etc. The signal systems were also included, as it was necessary to change the d.c. system formerly used with steam for the a.c. system when the road was electrified.

The figure taken as the investment for the property peculiar to electrical operation was the actual cost of installation—i.e., on the Coast division the prices obtaining in 1918 (1917 to 1919), and on the Rocky Mountain and Missoula divisions the prices obtaining in 1915 (1914-1916). The investment in the property peculiar to steam operation was based upon the actual cost, modified and adjusted to the price levels as of the electrical installations—i.e., on the Coast division as of 1918 and on the Rocky Mountain and Missoula divisions, which extend from Harlowton to Avery, as of 1915.

The carrying charges computed interest and depreciation. The interest rate has been taken as the rate paid by the railway during the different periods of installation—for the Coast division 6 per cent and the Rocky Mountain and Missoula divisions 5 per cent. Depreciation has been computed upon the sinking fund basis, using an interest rate of 6 per cent.

THE SYSTEM INVOLVED

The miles of track involved in electrification are as follows:

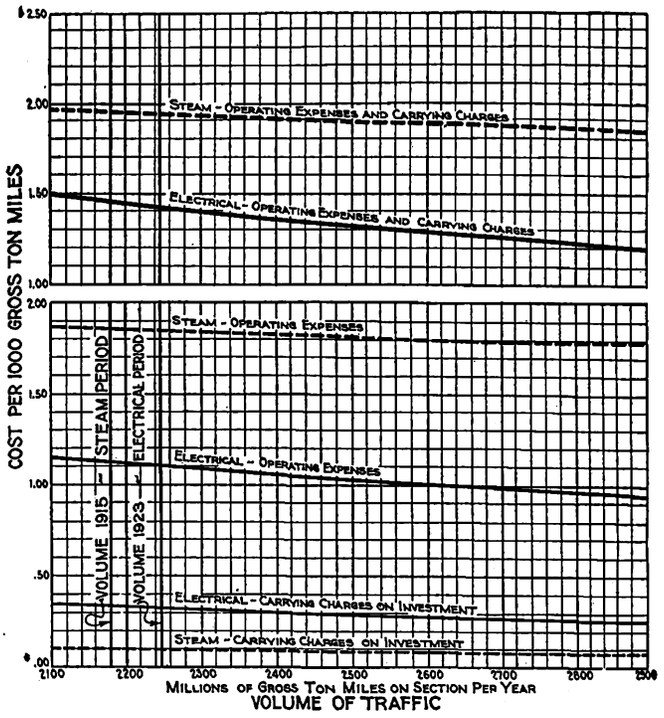
MILES OF ELECTRIFIED TRACK CONSIDERED, CHICAGO, MILWAUKEE & ST. PAUL RAILWAY.

	Miles of Track—First Main	Miles of Track—Other	Operation Dates
Harlowton to Deer Lodge	226	66	April, 1916
Deer Lodge to Avery	212	62	November, 1916
Othello to Tacoma (helper service)	...	...	August, 1919
Othello to Tacoma (through service)	208	72	March, 1920
Tacoma Junction to Tacoma (passenger)	2	...	April, 1920
	648	200	

The direct-current overhead trolley system of electrification is used. This current is not generated by the railway, but is purchased from hydro-electric stations along the line. It is received at taps in the company's high-tension lines, transmitted to substations where it is stepped down from three-phase a.c. at 100,000 volts to a working voltage of 2,300 and then converted to motor-generators to d.c. at 3,000 volts for distribution on the trolley. The motors of the locomotives are so constructed as to act as generators when descending grades, thus returning current to the line and controlling the speed of trains without mechanical braking. Full technical details of the electrification have been published in this paper.

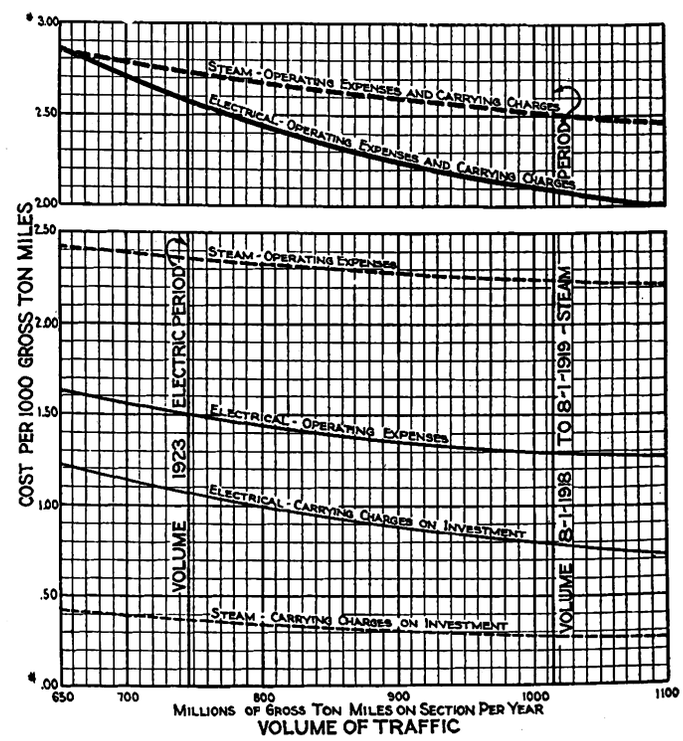
STATISTICS

The first of the accompanying tables shows for the years since the beginning of electrical operation the net saving from electrical operation, using for steam operation the actual cost of the last 12 months of such operation—adjusted to the cost obtaining in 1923; and for electrical operation, the actual cost as determined for the year 1923. The net savings shown are obtained by deducting from the savings in operating expenses the carrying charges of interest depreciation on the additional investment required by the electrification, which, as shown in two of the subsequent tables, amounted to $15,625,739.



Comparative Costs per 1,000 Gross Ton-Miles—Passenger and Freight—Of Operating Expenses and Carrying Charges as Investment in Property Directly Affected by Change in Power—Harlowton to Avery

From this table it will be seen that for the year 1923, with its comparatively low tonnage, the net saving from electrical operation of the two sections amounted to $1,271,793. For the minimum tonnage so far experienced, which was in the year, 1921, the savings amounted to $671,014. The maximum tonnage so far experienced was in 1919. Had the section from Othello to Tacoma been under electrical operation during that year, the savings for the two sections would have amounted to $2,355,199. Detailed figures of cost



Comparative Costs per 1,000 Gross Ton-Miles—Passenger and Freight—of Operating Expenses and Carrying Charges on Investment in Property Directly Affected by Change in Power—Othello to Tacoma

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on the bases described are given in the other tables shown.

The two charts present the savings per 1,000 gross ton-miles, freight and passenger, resulting from electrical operation in place of steam. In these charts it will be seen that the volume of traffic in the steam and electrical operating years were nearly the same for the Rocky Mountain and Missoula divisions, but in the case of the Coast division the steam operating year included a considerably greater volume of traffic than did the electrical operating year—a situation favoring steam operation to some extent in the comparative figures.

No Indirect Savings Credited

No savings were credited to electric operation which were not directly ascertainable, as for example the possible increased revenue due to the release of equipment used in the transportation of coal under steam operation. Similarly, no credit was given electric operation for the better utilization of freight equipment due to faster movement, less wear and tear on road and equipment, reduced station expenses and similar expenses affected by the number of trains required to handle a given tonnage. In the case of all of these items it was impossible to determine an exact monetary value for these incidental advantages. In the same way, no credit is given for the increase in passenger revenue resulting from the attractiveness and greater comfort of travel under electrified operation.

German Comment on Foreign Practice Report

A Supplement of the Report of the Foreign Practice Committee at Atlantic City Convention of the American Electric Railway Association, Prepared by a German Writer

THE report of the committee on foreign practice of the American Electric Railway Association, presented at Atlantic City last October, has attracted considerable attention on the continent of Europe as well as in England and the United States. The German comment is instanced by an extended abstract of the report, extended through three issues of *Verkehrstechnik*. It was written, with comments, by General Manager Stein of the Hamburg Elevated Railway, who was recently in the United States on a tour of inspection of American electric railways. Mr. Stein says many complimentary things about the report of the committee on foreign practice, among them that the members were careful observers and that while they may have seen many things through American spectacles, they accumulated a vast amount of valuable data. The omission of Germany from the itinerary, however, Mr. Stein says, is hard to understand, in view of the fact that so many American railway men have visited Germany during the last three or four years. Evidently he did not realize the limited time at the disposal of the committee.

The author then mentions a number of developments of electric railway interest which the committee might have seen in Germany, and this summary is published here somewhat condensed, as it may serve as a possible unofficial supplement, by a prominent German engineer and railway manager, to the report of the committee. Mr. Stein says:

They could not only have seen interesting historical objects, like the first electric car in the world, made by Siemens, but also developments which constitute today a decided advance in electric railway engineering and operating developments. Some equipment of chiefly German character was seen by the visitors in Switzerland, such as single-phase, main-road electrification and the bow type of trolley for surface cars. Notable developments in overhead line construction and locomotives for single-phase main-line operation, however, could have been studied to better advantage in Germany, particularly unusually large single-phase motors. It would have been possible on the urban and suburban lines in Berlin to have observed the latest types of direct-current equipment. Mercury-arc rectifier sets, much larger than those in France and Switzerland, could also have been inspected in Germany. The American visitors would have had an opportunity of observing the excellent results obtained on surface lines with brakes of the short-circuit, disk or solenoid types, which have given in this service better general results than air brakes or magnetic rail brakes. Of the latter kind of brakes, some notable models could have been seen in use on track with heavy grades, so arranged as to permit regeneration.

The visitors could also have learned how Germany has succeeded in economizing in the use of material and electrical energy. They would have found very interesting improvements in armature bearings and axle bearings, particularly in the use of roller and ball bearings and new types of inexpensive anti-friction bearing metal such as Lurgi metal. Oil-electric cars and storage-battery cars could have been seen in operation. Data could have been obtained in regard to progress in the development of rail sections. It should be remembered that the first rolled girder rail was produced in Germany (in 1873) and that the thermit-welding process was a German invention. The committee could have seen, in Dortmund, a four-wheeled car with a 4-m. (13-ft. 2-in.) wheelbase, equipped with a high-speed motor and automobile type of gear transmission. If they had visited Hamburg, they would have seen a new six-wheel auto bus. They would also have had an opportunity to observe important developments in signaling systems, such as the trouble signals in Hamburg, new methods of fare collection and accounting.

But most important of all, the committee would have found how common the practice is in Germany to plan the extension of city railway systems so as to fit in with future building operations. In many countries this is considered a practically unattainable ideal, but in Germany laws have been passed in this respect and good results are being obtained. Finally, they would have been able to see how engineer and architect, when working together, can design such attractive structures for use with subways and elevated railroads that these structures harmonize with the general architecture of the city.

Aurora-Elgin Time-Table Carries Much Local Information

INSTEAD of carrying advertisements, the back of the new time-table folder of the Aurora, Elgin & Fox River Electric Company contains useful information for commercial men as well as regular patrons. The interurban service time-table is printed on one side of an eight-page folder which measures 6¾ in. x 3½ in. On the other side of the sheet is information relative to Aurora, Elgin and the small towns through which the interurban line passes. Lists of clubs, theaters, hotels, hospitals, parks, banks and manufacturers are given. In the tabulation of manufacturers in Aurora and Elgin opposite each manufacturer's name is the name of the local street car line which passes near it. This information gives the commercial traveler an alphabetical list of manufacturers, their addresses and how to reach them.

In addition to this information, schedules of city car operation in Aurora and Elgin appear in the time-table. These schedules give the time of departure at the center of town and at the terminals for cars on all lines.

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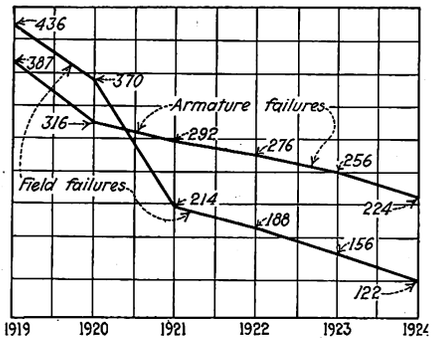
Equipment Maintenance Notes

Dipping and Baking Motor Frames Reduces Field Failures

A REDUCTION to about one-quarter of the former number of field failures has been made by the Washington Railway & Electric Company, Washington, D. C., during the past 5 years. Dipping and baking of armatures and fields was begun on an extensive scale in 1920 and dipping and baking of frames with fields in place was started in 1922. Although many factors have contributed to this result, it is felt by the company that the practice of dipping and baking motor frames with the fields in place has been an important reason for the improved performance record.

For this purpose an electric baking oven and dipping apparatus, as shown in the accompanying illustration, was built by the railway and installed in its P Street shops in 1922. Just before the motor frames are to be returned to service and after the new fields have been installed they are baked and dipped. The frame is preheated at 200 deg. F. for 7 hours in the electric oven.



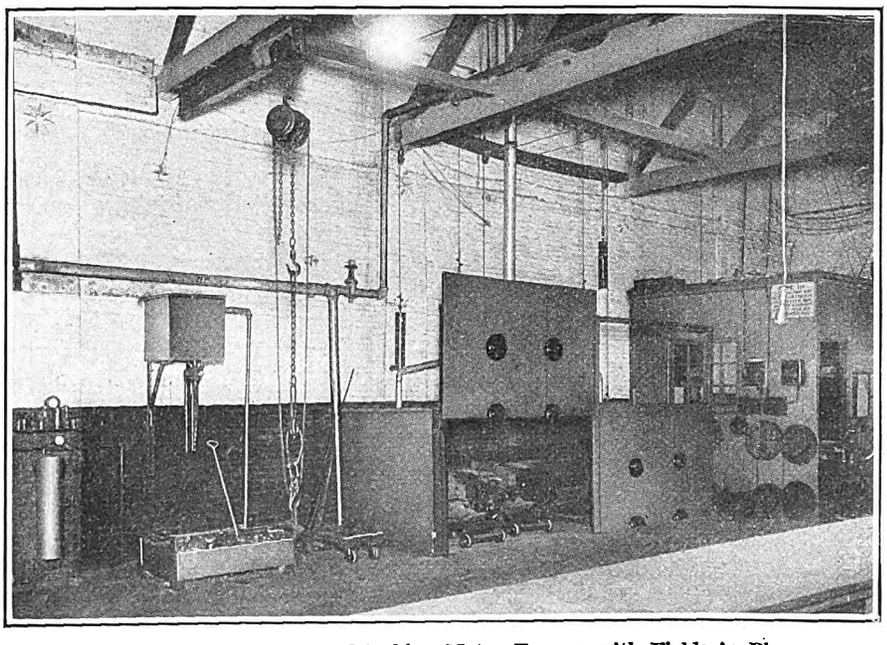
Total Armature and Field Failures

The effect of dipping and baking on the number of field and armature failures is clearly shown by the marked reduction since 1920.

Small trucks used to move motors around the shops are run right into the baking oven.

After the frame has been preheated all holes are plugged and it is suspended by the chain hoist above a shallow varnish pan. Wooden disks cover the openings usually occupied by the bearing housings. The frame is then filled with varnish from a tank above the pan. This is allowed to remain for 10 or 15 minutes until all bubbling ceases, when the varnish is allowed to run out into the pan. From the pan it flows through a pipe to an underground tank. After the pan is empty, a valve closes the pipe opening. A storage air tank located near by on the wall is connected to the underground varnish tank, so that the liquid can be raised by compressed air to the tank shown in the accompanying illustration.

After the frames have been thus impregnated with varnish they are allowed to cool. It is not thought necessary to return them to the ovens for further baking. The heat which the iron has accumulated during the 7 hours previous baking is retained for a sufficiently long time to dry out the varnish properly. All motor frames are treated in this way when they are returned to the shop for their regular 60,000-mile overhauling.

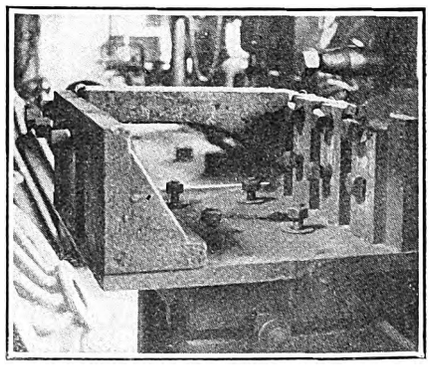


Apparatus for Dipping and Baking Motor Frames with Fields in Place

On the right are the plugs which are used to stop up openings in the frames. In the center is the electric baking oven, containing two motor frames. To the left is the varnish tank and the pan into which the varnish is emptied after the frames have been treated. Air control equipment is shown at the extreme left.

Pedestal Jaws Finished in Shaper

IN THE shops of the Gary Street Railway, Gary, Ind., cast-steel, bolted-type pedestal jaws, when badly worn, are replaced with new castings. These replacement castings are finished four at a time in a fixture attached to the bed of a shaper. These are held at one end by means of square-headed bolts and at the other end by setscrews. The fixture consists of a heavy steel base with uprights at two edges. The base is a piece of 1-in. rolled steel approximately 24 in. square. One upright is of 1¼-in. steel, grooved out to receive the shoulders on the top of the pedestal casting. Two ¾-in. square-headed bolts are used to fasten each casting to this upright.



Four Pedestal Jaw Castings Are Machined at One Time in This Fixture

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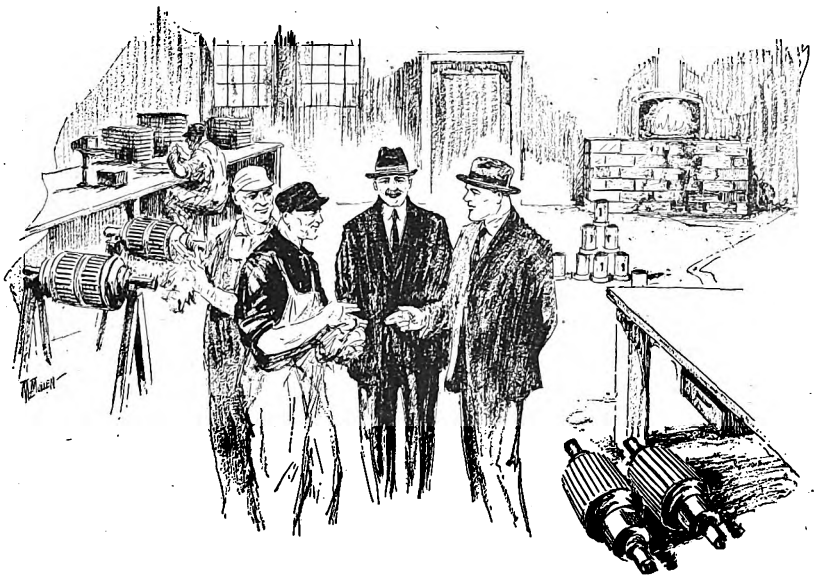
Dick Visits the Centerville Shop

And Makes a Suggestion



DICK PRESCOTT and Steve White of the Consolidated Railway & Light Company finally reached the Centerville railway shop. The master mechanic proved to be a very pleasant fellow. After Dick and Steve had explained to him that their inspection trip was for the purpose of gathering new ideas and information on current methods, the three started out through the shop. As they went over the work of various departments, many questions of maintenance practice were freely discussed between the two visitors and the master mechanic.

After several hours they found themselves in the armature room with the foreman of that department. While awaiting the return of the master mechanic, who had been called to the telephone, the subject of bearing maintenance came up.

"How do you decide when bearings should come out?" asked Dick. "Do you have definitely established limits of wear?"

"Why, let's see; I don't know how the stations are handlin' that now; wait'll I see. Oh, John, come 'ere a minute, will yuh?"

A husky, grimy workman approached the group in response to the foreman's call, wiping his hands on a piece of waste as he came.

"Say, John, how do those fellahs out at the station tell when bearin's have to come out?"

John hesitated a moment. Then he replied, "Why, they put a bar up under th' pinion and feel when she's gettin' pretty loose."

"Well, do they have a definite limit of wear allowance?" asked Dick.

"Sure, they take 'em out before th' armature tears up on th' poles. They feel when she's pretty loose with the bar. Sometimes they look at the armature to see if she's rubbin'."

"How about axle bearings?" questioned Dick.

"Oh, you can tell when they're gettin' pretty thin by heavin' up on th' motor with a bar."

"Well, then, you don't set a certain limit of wear and then take them out when they've reached that point?"

"Huh?—Oh, they jus' take 'em out when they look pretty loose."

As the master mechanic rejoined the group, the armature room foreman nodded to John, who returned to his bench, still wiping his hands on the piece of waste.

"What mileage do you get from gears and pinions?" asked Dick, addressing the master mechanic.

"Why, we don't have a record of the mileage of each one. I think we're gettin' pretty good mileage from the gears we've got, but I'm afraid they're a little too hard. We do have lots of trouble from broken teeth. Sometimes, when one piece breaks out it gets jammed in the teeth and bungs up the whole gear, and we've had some shafts break when they jammed. It sure makes a mess of the armature when a pinion breaks."

"We've just been talking about axle bearings," replied Dick. "Don't you think letting the bearings go too long might cause some of that breakage?"

"I don't know," replied the master mechanic. "There may be somethin' in that, though—we do get a ridge worn in the pinion face sometimes, out near the end of the tooth."

"I'm beginning to believe," said Dick, "that we've all been too economical on this matter of bearings, and that establishment of definite limits of wear would not only keep our gears fitting better but would reduce a lot of noise and vibration."

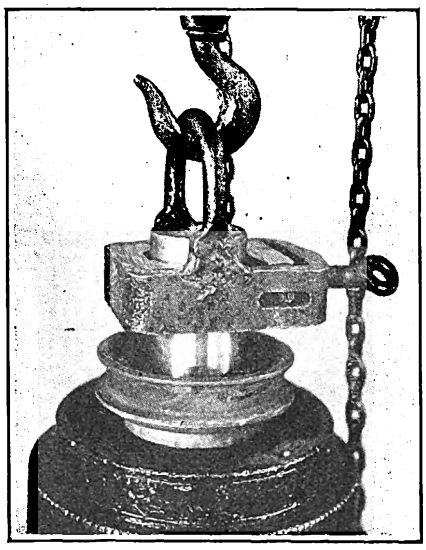
"I don't know but what there's some truth in what you say. If you get any more dope on that, I'd like to get hold of it."

"Fine!" said Dick. "I'll be glad to drop you a line when we get back."

The other upright contains four setscrews of ¾ in. diameter for steadying the small ends of the pedestal jaws. This upright may be removed from the base so that the castings may be easily mounted in the permanent upright. The jaws are first fastened to the permanent upright, after which the movable upright is placed in position. The setscrews are then run in to hold the castings. This set-up requires less than 10 minutes to make and allows four jaws to be machined at one time. The entire fixture was constructed in the shop from materials on hand and has proved handy in expediting this particular machining job.

Clamp for Holding Armatures Vertically

ARMATURES are dipped with the commutator end up in the shops of the Department of Street Railways, City of Detroit. For holding the armatures while supported by the hoist and also during handling, a clamp has been designed to fit the upper end of the armature shaft. This method of support keeps the clamp free from the compound during dipping and also facilitates rapid handling.



Clamp Applied to Armature Shaft to Support It in Vertical Position

The clamp consists of a casting with hook top. Two copper jaws are arranged to slide inside the casting, one being of V-shape, which is stationary, the other having ends which fit in slots of the casting to act as guides. After placing the clamp over the end of the shaft, it is tightened by means of an eyescrew. The copper pieces which bear against the shaft prevent injury and at the same

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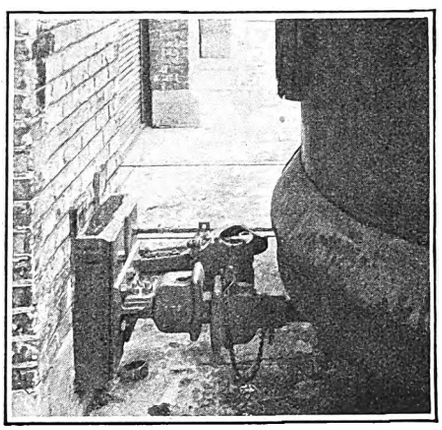
time insure a tight clamping action, so that there is no danger of the clamp slipping.

Testing Drawbars on Cars

DRAWBARS on the cars of the Milwaukee Electric Railway & Light Company are tested by coupling and uncoupling with stationary drawbars mounted on pillars between tracks at both ends of the transfer table bay. The tests are made at the Cold Spring shops. A rack on each side of the bay is equipped



A Rack Mounted on a Carhouse Pillar Between Tracks Contains Two Types of Drawbars to Which a Car on the Transfer Table May Be Coupled for Testing the Coupler and Draft Rigging

with one city type and one interurban type drawbar head. Both of these are identical in every detail with the types of couplers used on the cars. The rack is so mounted that the height of the drawbar heads on the rack is the same as the height of the drawbars on the cars.

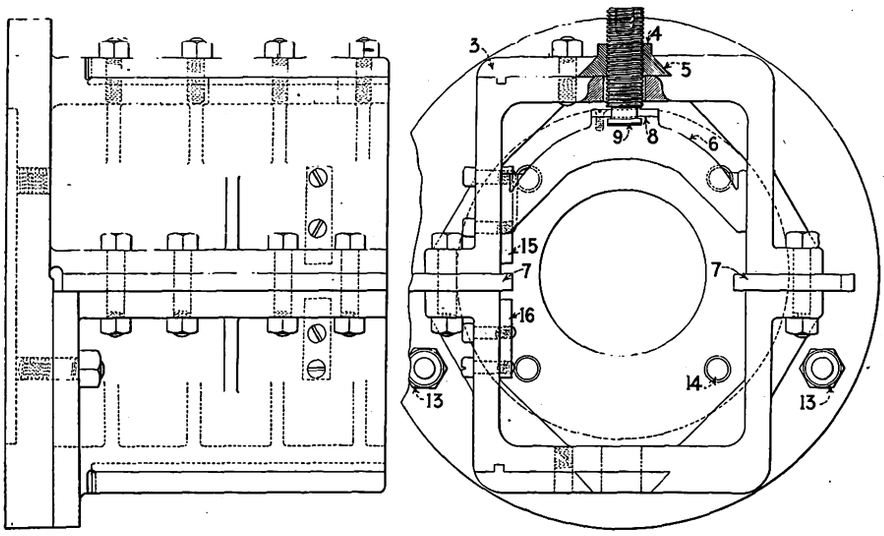
Inasmuch as all cars entering and leaving the repair shop floor are handled by the transfer table, they must necessarily pass by the racks. In this method of testing it is only necessary to stop the table at the proper place to line up the drawbars. Coupling and uncoupling are accomplished in the usual manner, the car being moved back and forth on the transfer table under its own power.

It has been found that visual inspection, or inspection with especially designed gages will not always disclose defects in the draft rigging, so that a more reliable system was needed. This practical method of testing by actually coupling with stationary drawbars has proved very reliable and actually discloses irregularities in the coupling devices which would be difficult of detection by any other system.

Lathe Chuck for Axle Bearings

THE difficulty frequently experienced in chucking axle bearings for boring is overcome in the Hillcrest shops of the Toronto Transportation Commission by use of a special chuck, shown in the accompanying illustration, which holds the bearing securely for reboring. The self-centering arrangement makes adjustment easy and saves much time and labor.

The chuck is bolted to the face plate of the lathe by stud bolts through the holes, No. 14 in the accompanying drawing. When in position the locating pads, which are No. 7 in the sketch, have one surface on the center line of the face plate. The axle bearing when placed in position has its split surface resting on the locating pads. The clamping screw at the top is then screwed down, which forces the clamping body down so as to hold the bearing firmly in position. After this has been done, the clamping screw is held firmly by the nut No. 5 and also by a nut clamp No. 3, which prevents any loosening.

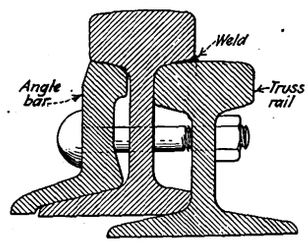


Axle-Bearing Chuck Used for Machining Bearings by the Toronto Transportation Commission

(3) Cast-iron nut clamp, (4) clamping screw, (5) bronze nuts, (6) cast-iron bearing clamp, (7) locating pads, made of tool steel, (8) retaining plates of machine steel, (9) tool steel wearing plates, (13) chuck studs, (14) face-plate studs to hold chuck in position, (15) top key, (16) bottom key.

Truss Rail for Repairing Rail Joints

ABOUT 200 rail joints with angle bars worn so badly that they did not give proper support were reconstructed by the Lincoln Traction Company, Lincoln, Neb. They were repaired by using a 6-ft. length of scrap T-rail of the same section as the rail to be repaired. The section of rail was drilled with the same spacing of holes as the angle bars, and was then driven under the outside at the joint as is shown in the accompanying illustration. One angle bar was used on the inside of the joint which was bolted through the running rail tightly to the truss rail. In addition, the two rail heads were welded along the seam. This made a very firm joint almost equal to continuous rail. The length of the truss section was sufficient to rest on four ties.



Truss Rail Construction Used for Repairing Worn Joints

Precautions in Replacing Field Coils

THE following points are well worth following while overhauling or repairing the field windings of railway motors:

1. The field coils and motor frames should be cleaned and painted.
2. Care should be used to make certain that field coils are placed properly in the frames, so as to give the proper polarity.
3. The use of a winding diagram will aid the man who is connecting the field coils, and assist in preventing wrong connections.
4. The polarity of each pole should be checked after coil is installed.

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5. Where coils are connected by means of cable leads, connections between coils should be made by butting the ends together and then covering the joint with a copper sleeve, which is soldered in place.

6. When coils have terminals, the end of the cable which fits into the terminal should have a metal sleeve soldered over the wire. This will prevent damage to the ends of the wire and insure a tight connection when the terminal screws are in proper position.

7. The ends of cables which connect to brush-holders should also be provided with metal sleeves or terminals that can be securely clamped and locked to the brush-holder casting.

8. All wiring around the frame should be securely anchored to the frame to prevent vibration and keep the insulation from being rubbed or cut by rotating parts.

9. Motor leads coming out of the frame should be protected by insulated bushings.

10. Coils should be spring-supported, and where necessary they should be backed up by washers of either metal or fiber, well painted.

11. Springs and washers should be taped temporarily to the coils while they are being replaced in order to keep the parts from working out of place and getting in between the pole and pole seat during assembly.

12. The surface of the pole and pole seat should be cleaned carefully in order to insure a good close fit when the bolts are drawn up tight.

13. A lock washer should be placed under each nut, and white lead added over the nut after tightening to prevent the entrance of water.

14. Poles should never be pounded into place with a sledge. The use of a wooden block or piece of soft metal will prevent damage.

15. After assembling, the poles should be sounded with a small hammer to insure that they are drawn up tight.

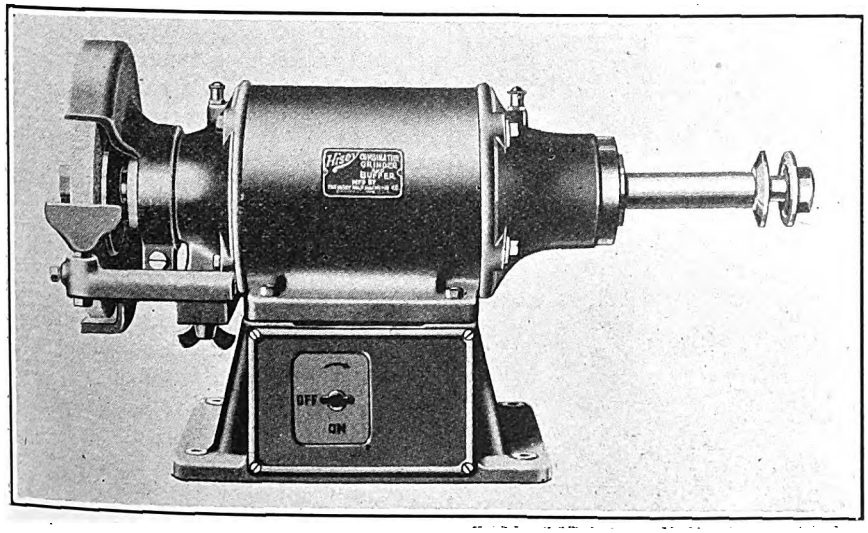
16. Where dipping and baking are carried out, best results are obtained from dipping and baking the entire frame after the coils are in place.

New Equipment Available

Grinding and Buffing Machines

A COMBINATION grinder and buffer of bench type and with floor-stand combination is being placed on the market by the Hisey-Wolff Machine Company, Cincinnati, Ohio. The bench machine is made in ½-hp. and 1-hp. sizes and is designed with an open type of spindle extension. The floor type machine is also made in ½-hp. and 1-hp. sizes, but is regularly furnished with encased spindles. These machines can be used for a large variety of shop work requiring the use of a grinding wheel, buffing wheel, wire brush or rotary wire rasp wheel. The machines with encased spindle are fitted with four ball bearings, while the open-spindle machines require only two. All bearings are completely inclosed, and are provided with heavy felt washers on each side of the bearing housing to keep out dust and grit.

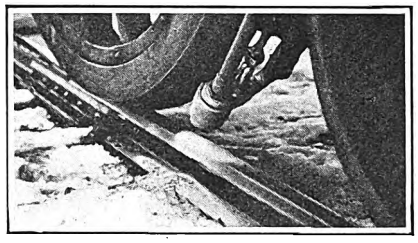
The spindles are unusually heavy and are made of high-grade steel, accurately ground. Flange washers are machined all over to provide accurate balancing. All inner flanges are firmly keyed to the spindle, but can be removed easily by hand. The machines are furnished with either direct or alternating current motors.



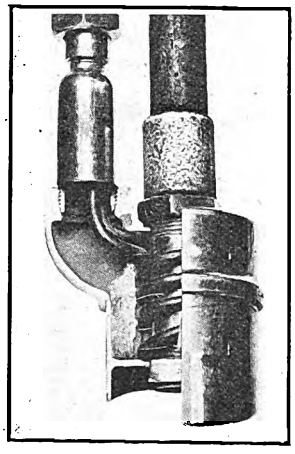
This Bench Type Combination Grinder and Buffer Has an Open Spindle Extension

Electric Sandpipe Heater

A TYPE of electric sandpipe heater for use on electric cars and locomotives to keep the lower end of the sandpipe dry and prevent clogging is being marketed by the Universal Electric Sandpipe Heater Company, Philadelphia, Pa. This heater is



Electric Sandpipe Heater as Installed on Locomotive



Section of Sandpipe Heater Showing Interior Construction

arranged to screw into the end of the sandpipe and a separate connection is provided for the conduit which carries the electrical connections. Standard armored cable can also be used. The function of the device is to keep the end of the sandpipe dry, as in stormy weather wet sand will not flow freely from the lower end of the sandpipe and the particles which stick to the sides of the pipe will eventually close the outlet.

The method of mounting and the construction of the device are shown in the accompanying illustrations. Inside the shell of the main heater

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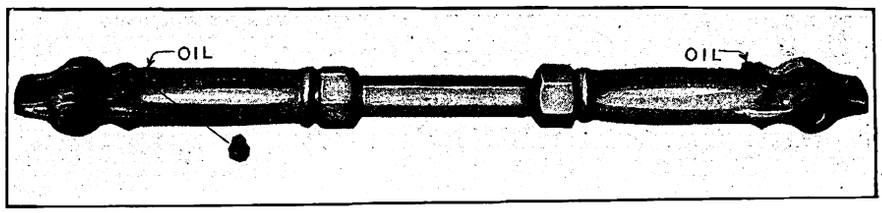
casting and around the lower end of the sandpipe is fitted the heating element. This consists of a length of Nichrome wire inclosed in but insulated from a metallic tube. This heating element is bent to a spiral form so as to surround the sandpipe, and the two leads for electrical connections are brought out through a separate opening in the casting. The heating element is made by the General Electric Company, Schenectady, N. Y.

When installed on electric cars or electric locomotives, the heating element is connected in series with one of the lighting circuits. The voltage and amount of current which passes through the element are thus reduced without the necessity of providing an additional external resistance.

A dependable flow of sand is essential to safe operation of electric cars and this sandpipe heater overcomes the difficulty of stoppage due to moisture and freezing conditions.

Lubricated Brake-Rod Casting

A FORM of brake-rod casting used by the J. G. Brill Company, Philadelphia, Pa., for the past two years on its type 79-E truck is now being applied to pivotal trucks wherever possible. In the design of this casting the lever end is closed so as to provide an oil chamber, access to which is through an opening tapped in the top of the casting. With the lever end closed the threaded brake rod is protected from dirt, water and snow. Being lubricated, it is safeguarded against rust. These advantages will be readily appreciated by the railway operating men as difficulties due to brake rods rusting tight are prevented and brake adjustments can be made more easily.



Closed Brake-Rod Casting with Provision for Lubrication

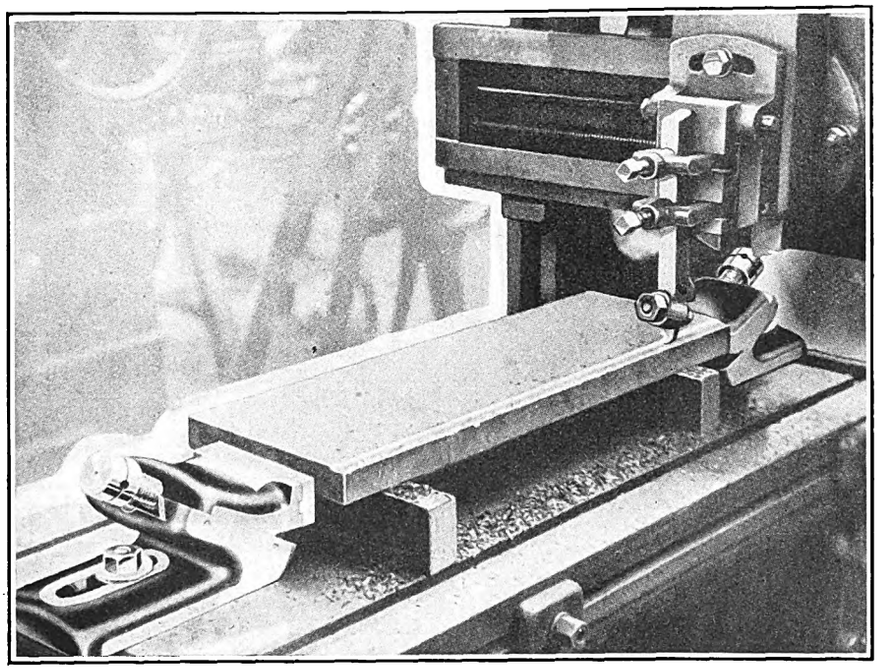
Divided Machine Vise

IN ORDER to overcome difficulties from clamping irregular shaped pieces for work on various machine tools, the Coats Machine Tool Company, New York, N. Y., has developed a divided machine vise. It is designed to hold tapered or irregular work in a parallel position and combines adjustability in height with an unlimited span. Through use of a compound parallel and downward movement of the jaws, the work is bedded on its support and eliminates the use of a hammer. The downward thrust of the jaws also permits the clamping of comparatively thin plates, so as to keep them lined up accurately on their packing pieces.

The body and jaws of the vise are made of close grained cast iron and the jaws are faced with hard steel serrated surfaces to insure a good grip. Screws are of steel and have right and left-hand threads, the left-hand thread running in a solid nut on the moving jaw, and the right-hand thread in the nut which is secured to the body. Each revolution of the screw produces a movement of the jaws equal to twice the pitch of the screw.

The jaws can be used either singly, in pairs, or in threes or fours, where necessary to clamp irregular shapes firmly. They may be placed in an offset position, as is frequently required by the shape of the work. Their main field of usefulness in electric railway shops is on the tables of planing, milling, drilling, shaping and slotting machines.

The vises are made in three sizes, with the width of jaw ranging from 2½ in. up to 10 in. and the diameter of the screw from ½ in. to 1½ in. The approximate weights per pair are 6 lb., 40 lb. and 220 lb. respectively, which takes care of all sizes of irregular work.



Divided Vise Clamping Work on Planer for Machining

Controllers for Shop Motors

AMONG the recent developments in control equipment for shop motors are three new types of starters being marketed by the General Electric Company, Schenectady, N. Y. These include an inclosed magnetic switch for starting two and three-phase alternating-current motors and two types of automatic starters for synchronous motors, one for full-voltage starting and the other for reduced-voltage starting.

With the inclosed magnetic switch, overload protection is provided by means of a relay which follows the heating curves of the motor. This switch can be operated by push button, pressure governor, float switch or similar device, and when used as a primary switch the only accessory needed is a drum switch.

Special features of the automatic starter include a temperature overload relay for close protection of the motor from overload, and a definite time relay which determines the accelerating period.

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Association News & Discussions

Southern Equipment Men Meet in Dallas

Ways to Reduce the Number of Pull-Ins, Car Painting, Education of Mechanical Employees, and Motor Maintenance Were Among the Subjects Discussed

A VARIETY of practical questions was discussed at the seventh semi-annual meeting of the Electric Railway Association of Equipment Men, Southern Properties, held in Dallas Jan. 21, 22 and 23. On the second day a joint meeting was held with the mechanical division of the Southwestern Public Service Association, and on the third day a trip was made to Fort Worth on the invitation of the Northern Texas Traction Company to inspect the shops.

A new system of overhauling cars on a 40,000-mile basis at New Orleans was described by R. M. O'Brien. This plan was outlined in ELECTRIC RAILWAY JOURNAL for June 21, 1924. Mr. O'Brien said that it is costing the New Orleans Public Service, Inc., $75,000 to start the system. In this is included the cost of extra parts, such as extra trucks, extra motors and extra line breakers. These will be changed every 40,000 miles. When cars are brought into the shops for overhauling, other trucks will be ready and other motors, line breakers, etc. The old equipment will be sent to be repaired by the practical railway shopmen and then to be tested by an engineer. The motor going out of the shop will be in as good condition as when first it came from the factory, Mr. O'Brien said. This new system is expected to result in a saving of about $450,000 per year.

After considerable discussion as to what really constitutes a "pull-in" the following definition was adopted: "A car which has to be removed from service prior to the completion of its regular prescribed run for any mechanical, electrical or man failure or accident will be termed a pull-in."

CAR PAINTING METHODS

Speaking on the subject of car painting, A. Taurman said that the painting of a car being repaired or rebuilt should begin when the parts are being assembled. In the painting of new steel cars, the inspector should pay special attention to the steel before it is assembled to see that it is carefully sandblasted and cleaned free of all dirt and grease, and that the primer is placed on this steel immediately after it has been sandblasted before rust has an opportunity to begin. He should also see that all concealed parts are painted before the steel is assembled.

Similar care should be exercised, Mr. Taurman said, in the assembling of wooden parts. All joints should be carefully white-leaded and all surfaces that are covered up or lapped should be given a coat of paint. As a strictly preservative precaution, the painting of the concealed parts adds more to the life of the car than any other detail of painting. Most painters, however, are prone to pay more attention to the finished and exposed surfaces than to the hidden parts. After all surfaces have been thoroughly primed and all crevices, cracks, nail and screw holes puttied up, the appearance of the finished job will be much better if all uneven parts are sanded off smoothly.

While it is very essential to have the best material possible, too much thought cannot be given to the manner in which the painting is done. The surroundings and temperature of the paint shop are very important items, Mr. Taurman said. The paint shop should be kept warm and as dry as possible at all times. In fact, it is much better to have the cars thoroughly dried out before the painting is begun. Good results can be obtained from a number of the standard painting systems, and enamel has good features, too, Mr. Taurman thought, especially because it saves time. Flat color and varnish, however, are preferred by him because it is possible to use more varnish than with the enamel system.

EDUCATING SHOPMEN

Effective methods of educating the employees in the mechanical department were considered at length. Mr. Taurman said that the best way was to arouse the interest of the men, and to inform them of what the company is trying to do. This makes their work easier and more pleasant. The practice of the Shreveport Railways, according to C. D. Rushing, is to explain to every man his mistakes. This company also urges its employees to read ELECTRIC RAILWAY JOURNAL and other publications. If any employee has a good suggestion, the company is glad to try it. Putting a new man with an old man who is familiar with mechanical work is recommended by I. E. Kinser. Ideas along somewhat the same lines were outlined by W. Silvus, C. B. Lane and J. J. Vaughn.

In Fort Worth, the Northern Texas Traction Company has night classes for mechanical men. The I. C. S. course is taught to the employees at classes held two nights a week. If a man finishes his course, he is reimbursed for the cost, according to J. T. Porter, but if he does not finish it, he must stand the expense himself. Advantages of the I. C. S. courses and other vocational training courses were described by H. C. Pressler and W. W. Holden.

Mr. O'Brien stated that he holds a meeting of the foremen once a month. At this meeting they select some one subject and discuss it. Mr. O'Brien displayed a textbook which is furnished to every man in the mechanical department of the New Orleans Public Service, Inc. The men are allowed to take these books home to study. Good results have been obtained by this means, he said.

Having few pull-ins is a good indication that the equipment is well maintained, in the opinion of Richard Merriweather, vice-president and general manager Dallas Railway, who addressed the meeting. The Dallas Railway has profited by belonging to the Electric Railway Association of Equipment Men, Southern Properties, he said. Records of pull-ins during the past 3 years indicate that this company is progressing, and it is due to the fact of belonging to the association, he believes, because attention was thereby directed to the matter of pull-ins.

Mr. Meriwether also emphasized the importance of educating the shop men. It makes very little difference how good a mechanic the man at the head of the equipment department may be; if he is not an executive and cannot organize his forces and inspire them in a way to get the best work from them, he is a failure. Although he may be the best mechanic in the world, he is worth nothing to his company unless he has ability as an organizer. Work in the mechanical department is likely to get stale unless the interest of the men is maintained. A man working at a bench gets into a rut easily, but education will go far to develop him and push him along, Mr. Meriwether said.

MOTOR VENTILATION STUDIED

Methods of installing exterior ventilators on non-ventilated railway motors were described by Mr. Rushing. His company has installed a ventilator furnished by the Westinghouse Electric & Manufacturing Company on the commutator end of Westinghouse No. 306 motors. Two cars were equipped in this way 5 months ago and a recent inspection showed that the motors were in much better condition than the motors without ventilation. A new shaft is furnished with the commutator end tapered to fit the new housing necessitated by the ventilator. As far as ventilation is concerned Mr. Rushing said that it is entirely satisfactory and the motor is much cleaner inside.

Considerable variation in the period of inspection among the different companies was indicated by the discussion on this subject. The frequency when based on mileage varied from 500 to 2,000 miles. Companies making inspection on a time basis generally do so every 7 days, but a few use 8 or 10 days as the inspection period.

A brush-holder designed by the Westinghouse Electric & Manufacturing

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Company to prevent dirt getting in between the brush and the holder in ventilated motors was exhibited by W. C. Looney. He said that by using this brush-holder the Houston Electric Company had increased the mileage from 1,500 to more than 8,000.

The comparative life of armatures as a result of dipping and baking was discussed. Mr. Taurman said that his company got three times as much life out of armatures that had been dipped and baked. F. Wampler said that the Cincinnati, Newport & Covington Railway had been obtaining an average life of 76,000 miles per armature before dipping and baking and that this had been increased to 342,000 miles. M. B. Osborne estimated that this process doubles the life of armatures. Mr. Pressler agreed with this view and W. K. Curtis estimated the increase in efficiency at 20 per cent.

The frequency with which it is necessary to renew motor leads developed considerable divergence of opinion. Estimates of their useful life varied between 4 and 10 years.

At the end of the Thursday afternoon meeting officers were elected for the coming year. The present officials —A. D. McWhorter, president, and A. Taurman, vice-president and secretary-treasurer—were unanimously elected. On the invitation of J. M. Kington it was decided to hold the next meeting of the association in Knoxville, Tenn., on July 22, 23 and 24.

Members present at the meeting were: A. D. McWhorter, A. Taurman, G. D. Rushing, E. D. Wright, Frank Wampler, E. W. Jenkins, F. T. Dawkins, W. Silvus, I. E. Kinser, W. H. Curtis, J. J. Vaughn, R. M. O'Brien, J. M. Kington and J. L. Brown.

L. B. Stillwell to Head Engineering Foundation

AT THE 10th annual meeting of the Engineering Foundation board, held in New York recently, L. B. Stillwell was elected chairman of the Foundation. He succeeds C. F. Rand, who declined re-election after serving for 5 years. E. D. Adams, who has been first vice-chairman since 1915, was re-elected to that office. E. A. Sperry was chosen second vice-president. Other officers named were: Treasurer, J. S. Langthorn; assistant treasurer, H. A. Lardner; director and secretary, A. D. Flinn.

Mr. Stillwell is a past-president of the American Institute of Electrical Engineers and the American Institute of Consulting Engineers. He is a member of the American Society of Civil Engineers, the American Engineering Council, the National Academy of Sciences, the Institution of Electrical Engineers of Great Britain, the Royal Society of Arts of Great Britain, the American Philosophical Society and the Franklin Institute. He is also a trustee of Princeton University and a director of the United States Chamber of Commerce. For several years he was connected with the Westinghouse Electric & Manufacturing Company. Later he was identified with the electrification of the Manhattan Elevated Railway and the rapid transit systems in New York city and elsewhere.

Announcement was made at the same meeting that the four founder societies of civil, mining, mechanical and electrical engineers had begun the study of plans to increase the endowment of the Foundation, established by Ambrose Swasey with a gift of $500,000, and recently supplemented by a bequest of $50,000 under the will of Henry R. Towne.

Hoover Sees Progress in Highway Safety Program

REAL progress toward better control of traffic to prevent accidents has been made since the recent conference on highway safety, according to Herbert Hoover, Secretary of Commerce. On this subject Mr. Hoover said:

"Legislation to improve safety on the highways has been introduced into 38 state legislatures since Jan. 1. The various classes of legislation and the number of states in which each class has been introduced can be summed up as follows: Licensing of drivers, 11 states; driving while intoxicated, 17; failure to stop after accident, 6; speed, 12; impounding or confiscation of the car as a penalty for violations of the motor vehicle law, 2, and for transporting liquor or other illegal use, 7; compulsory stopping at railroad crossing, 12 (one legislature is considering a bill to repeal an existing railroad crossing stop law); certification of title, 10; compulsory automobile insurance or bond, 20.

"Recently a law has been introduced in one state legislature amending a law of 1858 with regard to 'the passage of each other by vehicles on the highway,' thus showing that the traffic problem is by no means a new one.

"This legislation, if adopted, will increase to 23 the number of states which require that all drivers of motor vehicles shall be licensed. Fourteen more states will require licenses for drivers of vehicles for hire, while there would remain 11 states without operators' license laws of any kind. Twenty-two states will require some sort of examination before the issuance of license to the applicant.

"In addition to state activities, movements are being started in a large number of cities for carrying out the recommendations of the conference for the co-operative organization of communities for public safety. While many of these cities have had safety programs in the past, these are being revised and an effort is being made to have them conform to the national program as far as local conditions will permit.

"At the present time 12 states have laws requiring the certification and registration of automobile titles, while similar laws are being introduced in the present sessions of the legislatures of four others. The conference designated this class of legislation as 'one of the most important and effective means for reducing thefts, and, by virtue of this result, owing to the relation between the theft and accident hazards, also a measure for improving the present public accident situation."

Pacific Claim Agents' Association

THE next meeting of the Pacific Claim Agents' Association will be held at the Hotel Biltmore, Los Angeles, Cal., July 22 to July 25, inclusive. This date was set at a meeting of the executive committee of the association, held at the offices of the claims department of the Market Street Railway, San Francisco, on Feb. 14. A tentative list of subjects follows:

"Will Periodical Physical and Mental Examinations of Trainmen Reduce Accidents? How Often Should These Examinations Take Place and What Should Be the Scope of Such Examinations?"

"Methods of Facilitating Vehicular Traffic in Cities."

"The Advantages and Disadvantages of Presenting Claims Against Automobile Owners and Others Responsible for Damage to Company Property."

"Perfecting Plans for Reference so that the Claims Department in an Emergency Can Be Readily Enlarged to Meet Any Catastrophe that May Arise on Company Property."

"Training of Men for Positions as Investigators and Adjusters."

American Association News

A. E. R. A. in New Quarters

NEW OFFICES are now being occupied by the American Electric Railway Association. They are in the Johns-Manville Building, 292 Madison Avenue, New York, at the southwest corner of East 41st Street. The move from the former quarters at 8 West 40th Street was made over the holiday which included Feb. 23. The change was made with great celerity.

The space now occupied comprises the whole 14th floor. The quarters are plainly but comfortably and efficiently furnished and arranged. Partitions, the upper half of which are glass, separate the various offices. The lighting system is semi-direct. As for the building itself, it is about 5 minutes walk from the Grand Central Terminal, 3 minutes from the subway system and surface lines, and close to the Engineers' Club and the Transportation Club.

More than 2 years ago the former office space became overcrowded, and the association took over two additional rooms on the same floor. The volume of work continued to increase, and a year ago additional space was taken on the fifth floor of the building. This arrangement was not satisfactory since it separated the Bureau of Information and Service from the rest of the headquarters, but it was the best that could be done at the time.

L. S. Storrs, the new managing director of the association, will have his headquarters in the Johns-Manville Building, but their location has not been definitely determined. His suite, however, will probably be on the 12th floor of the building, the one immediately below the floor now occupied by the other officers of the association. There is no 13th floor.

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The News of the Industry

Home Rule for Buses Up Again in Ohio

The hearing before the Public Utilities Commission of Ohio on the applications of the People's Motor Bus Company and the Cleveland Railway for operating rights in Cleveland, scheduled for Feb. 11, was postponed indefinitely to give the State Legislature, now in session, a chance to consider amendments that have been proposed to the existing law under which the operation of buses is regulated. One of these amendments will take control of motor bus transportation in cities and in municipalities contiguous thereto from the State Public Utilities Commission and place it in the hands of the local governments. A bill to do this has already passed the State Senate, and lacked but one vote of passing the House on Feb. 19. On reconsideration the measure was to come up again during the week ended Feb. 28.

Unlawful for City to Pass Ordinance Against One-Man Cars

Judge Isaac Wolf in the Superior Court at New Haven, Conn., recently granted a permanent injunction restraining the city of New Haven from interfering with the operation of the one-man double-truck trolley cars used by the Connecticut Company in that city.

In handing down his decision Judge Wolf made it plain that the issue did not involve whether the ordinance in question should be adopted and enforced upon the ground of public convenience and safety, but merely whether the city by provisions of its charter is vested with power to pass such an ordinance. The city protested the operation of the one-man double-truck trolleys with "An ordinance to prevent accidents, facilitate traffic and preserve good order in the streets of the city and highway districts and to secure the safety of persons using said streets."

No Abandonment on Five Lines in Buffalo

The Public Service Commission issued an order directing the International Railway not to abandon service on Feb. 22 on five of its local lines in Buffalo as had been threatened.

In a conference with members of the Public Service Commission in New York city 48 hours prior to the time the abandonment order was to go into effect Coleman Joyce, chief counsel for Mitten Management, Inc., although consenting to withdraw the order, said that no court or commission could force the company to undertake the operation of a non-paying enterprise and that the International Railway has been operating its system at an annual loss of $660,000. The commission, however, issued a mandatory order directing continued operation of the five lines which were scheduled for abandonment.

One-man cars were placed in operation on Feb. 22 on three additional lines in Buffalo—Niagara Street, Broadway and Elmwood Avenue. These are three of the heaviest patronized lines in the city. The economy program was announced by the company in a brief statement to car riders.

There is now pending before the Public Service Commission an application of the company for a higher rate of fare and a similar action is pending whereby the city seeks to have the fare reduced to 5 cents. The present fare is 7 cents or four tokens for 25 cents. A rate of 8 cents cash with two tickets for 15 cents has been suggested.

The International Railway is considering the abandonment of the Main Street car line in the city of Niagara Falls and has asked for a 7-cent fare or four tokens for 25 cents in that city. The company now charges a 5-cent fare in Niagara Falls.

Bus Report Presented in New York

Transportation Board Makes Suggestions for Guidance of City—Routes for Private Operation Recommended—Many Railway Companies Seek Operating Rights

THE Board of Transportation of New York City filed with the Board of Estimate and Apportionment on Feb. 20 its second report on the pending petitions for omnibus franchises in the city of New York. The report deals with 80 applications by 52 corporations or individuals, many of them local railway companies, for franchises to operate 113 routes.

The report was made in response to a resolution of the Board of Estimate on Nov. 3, 1924, requesting the Board of Transportation to conduct a further examination and investigation of all applications for omnibus lines in the five boroughs and to embrace in the report information which the Board of Transportation deemed should be in possession of the Board of Estimate for its guidance in considering omnibus franchise applications.

If the right of the city to own and operate omnibus lines is upheld a series of routes and lines that may properly be established in all the boroughs is laid out and recommended in the report. If the right of the city to engage in municipal operation of omnibus lines is denied, it is recommended that a grant, either in the form of a permit or a franchise, be made to petitioners desirous of providing such operation. In this event, the board believes a definite plan of routes and franchise conditions should be considered so that all those seeking franchises may have a standard form of application and the Board of Estimate have for its consideration proposals that are comparative and competitive.

The report points out that if the city cannot undertake municipal omnibus operation the Board of Estimate could tentatively, at least, approve the routes and the form of proposed franchise and invite applications which would be uniform.

As a basis for standard proposals for franchise grants the board recommends that the following factors be adhered to:

(a) Duration of franchise.
(b) Fare to be charged and transfer conditions.
(c) Compensation to be paid to the city for the franchise.
(d) Service or headway to be offered at the beginning of operation.
(e) Type of vehicle to be employed.

In its treatment of the question of fares the report states:

Most of the petitioners for omnibus franchises express willingness to operate and maintain service for a 5-cent fare. Some offer to grant transfers for that fare without extra charge for transfer, and others stipulate that a charge shall be permitted for transfers. Others of the petitioners, including some of the surface railroad corporations and the corporation that now operates a comprehensive omnibus system in Manhattan under perpetual franchise and temporary permits for a 10-cent fare, demand a 10-cent fare for longitudinal or trunk line service, with a 5-cent fare for crosstown or short route service. Those corporations that offer service for 5 cents are for the most part newly created, and some of them are not at present in the transportation field. There is no present reason, however, to question their financial ability to carry out the proposals submitted.

Records of omnibus operation in this city and elsewhere show that such operation is being maintained over certain routes for a 5-cent fare. On some routes the return for a 5-cent fare may be inadequate because of light patronage or length of haul, but for a system embracing both short and long haul traffic several of the petitioners state that they are prepared to operate for a 5-cent fare.

The report indicates that the estimated initial cost of equipping and housing 1,259 buses will be approximately $11,000,000, of which $3,000,000 will be for garages. The estimates for bus equipment are:

	Buses	Cost
Manhattan	439	$3,130,900
Bronx	73	497,100
Brooklyn	422	2,743,000
Queens	325	2,112,500
	1,259	$8,483,500

In dealing with the cost of operation the report says:

From most carefully compiled statistics it would thus appear that in order to meet all necessary expenses on the basis of a 5-cent fare eight or more passengers per mile must be carried, or "picked up," for double-deck service and six or more passengers per mile for single-deck service.

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Forty of the 52 corporations or individuals that have petitioned for bus franchises seek to obtain grants for single routes or for from two to six routes. These applications are classified as miscellaneous largely for the reason that in many cases the routes are disconnected or that generally no comprehensive system of bus transportation is indicated by the applications.

Among the applicants for bus routes to be operated in conjunction with existing rapid transit lines are the Brooklyn-Manhattan Transit Corporation, the New York Railways and the Staten Island Rapid Transit Railway.

The application of the New York Railways discloses that the company proposes to abandon 20 miles of trolley lines and substitute 40 miles of bus routes. The railway officials suggest payment of $5,857,577 out of omnibus earnings in return for discontinuance of surface railway property that cost originally $7,857,405. Part of the surface railroad track proposed to be paid for under this amortization scheme has been unused and practically abandoned for some time past. It is estimated by the company that the salvage that will accrue to it from sale of this scrapped surface railroad property will be 5 per cent of original cost. Franchise rights are asked for practically 100 per cent more mileage for omnibus service than it is proposed to discontinue as surface railroads.

While a 5-cent fare can only be charged for railroad operation, a 10-cent fare is proposed for longitudinal or trunk lines of omnibuses. The only free transfer proposed in connection with omnibus service is from 10 cent lines to 5 cent lines.

The Interborough Rapid Transit has not filed formal application for a bus franchise, but the company has expressed a desire to operate crosstown or other feeder lines as may be agreed upon for a 3-cent fare. The Third Avenue Railway, operating in Manhattan and the Bronx, has also signified its willingness to run buses.

Express Bus Service Between Fairmont and Morgantown

De luxe express bus service between Fairmont and Morgantown, W. Va., is being planned by the Monongahela-West Penn Public Service Company as an added feature to its Morgantown-Rivesville service. If the State Road Commission concurs in the arrangement, the service will be started in about 6 weeks.

A modern Fageol bus of 25-passenger capacity has been purchased and the contemplated schedule provides for four or more round trips each day with running time between the two cities 1 hour and 15 minutes.

Bus Lines Will Supplement Railway in Minneapolis

Although it has been ruled that a proposed ordinance granting the Minneapolis Street Railway, Minneapolis, Minn., an exclusive franchise to supplement its trolley system with bus lines will require a special enabling act from the Minnesota Legislature the city attorney holds that by agreement Council may require the company to establish certain bus lines. The company now is operating buses between the Twin Cities and between St. Paul and Stillwater, Minn., a suburb.

The railway expects to spend $500,000 for bus equipment after the ordinance is passed, in addition to buses already planned to fit ordinances already effective and those now in service in north Minneapolis. A garage will cost $100,000 additional. Universal transfers will be given, but the bus fare will be higher than the car fare, which is 6 cents.

Chicago Mayor Wins

Prospects for $600,000,000 Traction Program Believed to Be Enhanced by Election on Feb. 24

Mayor Dever and Samuel Insull have agreed on $85,000,000 as the price to be paid by the city for the Chicago elevated lines. The conclusion of the deal was announced on Feb. 25, after 8 months of dickering. The compromise was reached the day after the forces aligned behind Mayor Dever had succeeded in electing an outright majority of the City Council to back up his $600,000,000 traction ordinance. This measure called for the construction of elevated lines by the city in the event that a deal with Mr. Insull could not be arranged. The city yielded several points in the ordinance and the redraft was at once submitted to the Council for passage.

The outstanding feature of the election on Feb. 24 was the decisive approval of the policies of Mayor Dever as reflected in the results at the polls. Mr. Insull's attitude is that so urgent is the necessity for an adequate transportation plan that he cares not what the scheme may be that is proposed, provided it embodies a co-ordination of the local transportation facilities and the development of rapid transit in the largest sense of the word.

Hostility of the old ring of Chicago politicians who ran on a "5-cent fare" platform in the days of William Hale Thompson has taken a new turn in relation to the $600,000,000 Chicago traction ordinance. Governor Small has entered the arena with an order to the Illinois Commerce Commission to make a thorough investigation of the ordinance before it comes to referendum. He is also having a traction bill drafted for the Legislature.

Small acted at the behest of Fred Lundin, who "made" Thompson and had to retire from politics when the notorious Chicago graft trials broke Thompson's grip on the machine. Thompson and Lundin split. The latter now seeks to take away the foundation for Thompson's 1927 mayoralty candidacy by stealing the transportation issue.

The bill which Small is having drawn is likely to provide for the creation of a "transportation district," a tax-assessing government functioning similarly to school governments. Thompson once sponsored such a plan, but Lundin now says he was the author of it. The price of political preference is again being expressed in terms of patronage.

Rockford Mayor Awards Franchise to New Company

The city traction problem in Rockford, Ill., became acute recently when Mayor J. Herman Hallstrom cast the deciding vote awarding the railway franchise to the Rockford Public Service Company, headed by T. M. Ellis, Jr., in opposition to the Rockford City Traction Company, now operating in the city. The Council was divided eight and eight on the two franchises submitted. Final action is dependent upon a referendum at the city election on April 7.

Prior to the Council's action the Rockford City Traction Company ran a series of advertisements addressed to the public and Council in which it set forth its side of the case.

The City Traction Company for 2 years has been operating under a temporary franchise, but has been negotiating for a franchise ordinance embodying railway and bus services, and had apparently come to an agreement on terms when Mr. Ellis came forward with his offer. The Rockford City Traction Company does not consider the problem settled. W. C. Sparks, manager; F. W. Walker, representative of the bondholders, and Judge R. K. Welch, attorney for the company, issued a statement expressing surprise at the hasty action of the Council "without giving all parties interested a chance to be heard and which, if it prevails, works a gross injustice on those who now have their money invested in this property." The various steps in the Rockford controversy have been followed in the ELECTRIC RAILWAY JOURNAL.

Insurance Measure Dead in New York

Compulsory insurance for all motor vehicle owners is dead at Albany for this year at least, in the opinion of Lewis G. Stapley, chairman of the motor vehicle committee of the Assembly and chairman of the joint legislative committee on motor vehicle legislation, who presided at the hearing at Albany on Feb. 24 on the various motor vehicle bills before the Legislature.

The New York State Auto Bus Association, however, through James J. Dadd of Rochester, its secretary-treasurer, has recommended the amendment of section 282-b of the highway law, so that all motor bus concerns carrying passengers for hire would be subject to the provisions. At the present time the law excepts corporations. While the Public Service Commission is requiring liability insurance as a stipulation to the certificate of convenience and necessity this ruling is not retroactive as to old corporations. The Bus Association feels that what is fair for one is fair for another and that it is unfair to except a bus owner because he is a corporation. An amendment to the law covering this feature is expected to be introduced at an early date.

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Passage of Moorhead Bus Bill Awaited

The Moorhead bus regulation bill was advanced another step toward passage in the Indiana Senate on Feb. 9. The bill would place commercial motor vehicles under the regulation of the Public Service Commission. Bus interests want their vehicles under the direction of the State Highway Commission.

The Moorhead bill was amended so as to exclude private truck owners. Another amendment made provision for continuance of city bus lines under the control of city boards where already so established. The third amendment was to the clause taking care of existing bus companies in the matter of issuing certificates of convenience and necessity. It made that clause refer to bus lines that were in existence ninety days prior to the taking effect of the act instead of ninety days prior to Jan. 1, this year. The fourth amendment struck out the emergency clause. This will delay the enforcement of the act, if it is passed, until the proceedings of this Legislature are published, which will be some time in May. With the emergency clause attached, the bill would be in effect immediately after the Governor appended his signature.

Goldsboro to Have Buses

The Board of Aldermen of Goldsboro, N. C., recently granted an exclusive franchise to H. G. Bales, for the operation of buses beginning March 1, 1925, for a period of 10 years. Mr. Bales is president of the Highway Motor Transit Company, a concern operating buses between Goldsboro and Warsaw. Transportation will now be available to the residents of Goldsboro, who have been denied service since the Goldsboro Electric Street Railway abandoned service a few years ago.

A recent statement from the city said that the Goldsboro Electric Street Railway was no longer in existence since the city took over its holdings; that the property was now in charge of C. W. Grantham as city manager, and that the greater portion of the trackage and equipment had been dismantled. Further, it was the purpose of the city to dispose of all the equipment. The new proposed operation will consist of not less than three buses of the street car type with a passenger carrying capacity of between 20 and 27 passengers. Mr. Bales said he could loop the city with five buses run on regular schedule. The rate of fare will be 10 cents, but books of 20 tickets will be sold to school children for $1. It is said that the original investment requires $50,000.

Albany Company Seeks 10-Cent Fare

The United Traction Company, operating in the cities of Albany, Troy, Cohoes, Watervliet and Rensselaer, N. Y., filed a petition with the Public Service Commission on Feb. 21 asking for an increase in its fares from 7 to 10 cents, effective on short notice. The 7-cent fare was fixed by order of the commission on July 5, 1922.

The petition of the company declares that the fair value of the railway now exceeds the sum of $15,000,000 and that the revenues have not been sufficient to meet the costs. A table submitted shows for 1922, from June 30, a total railway operating revenue of $1,524,814 and operating expenses and taxes of $1,461,939, leaving net operating revenue of $52,875; 1923, operating revenue, $3,234,149, operating expense, $3,084,437, with net revenue of $149,711; 1924, operating revenue, $3,205,856; operating expense, $3,076,247, with net revenue of $129,608, all before the payment of fixed charges and taxes.

More Bus Rights Sought in Rochester

Independent bus owners of Rochester, represented by James J. Dadd, secretary of the New York State Auto Bus Association, have petitioned the City Council for permission to operate a belt bus line over 30 streets in the city of Rochester. The proposed line will cross thirteen of the local lines of the New York State Railways, but only in a few minor instances will it parallel the railway routes. It is planned to operate with six sedan type buses.

Rochester now has virtually no cross-town lines and the proposed route circling the city would connect with all parks, golf links, etc. Its backers profess themselves willing to furnish transfer privileges with the railway.

As has been explained previously, the New York State Railways has petitioned to run buses over the Ridge Road, a route now served by Buckley & Buckley, operating under the name of the Ridge Road Bus Lines. Officials of the state bus men's association opposed this plea at public hearings. Following announcement that the Manitou railway line would suspend operation, the New York State Railways proposed to establish a network of bus lines along the lake shore serving towns along the railway. The independent owners, headed by Mr. Dadd, now propose to operate buses from Nine Mile Point to Manitou, serving virtually the same route. They have petitioned the town boards along the line for operating rights.

The Council has referred the belt line petition of the independents to a committee. Council members, it is said, are loath to authorize any competition with the New York State Railways, which operates in Rochester under the service-at-cost contract and for 4 years straight has failed to make its guaranteed return.

Expansion of the bus system of the railways is looked for as the outcome of the rivalry. Purchase of the Buckley line by the traction interests is regarded as another possibility.

Canadian Government Suggests Electrification.—Electrification of railroad lines in Quebec Province is forecast by Premier Taschereau, who recently suggested such a plan and promised that if railway companies adopted the proposal the province would do all in its power to assist. Abitibi Southern, which is now obtaining its charter, is the first road to indicate it would take advantage of government suggestion.

Question of Paving Responsibility Considered

The New York Transit Commission reserved decision on Feb. 24 on the question whether the New York Railways in its reorganization should be permitted to abandon lines on which service has been discontinued and thus probably escape responsibility for its share of the cost of repaving and resurfacing the streets when the tracks are torn up. The cost to the company, if it is held responsible, is estimated at about $500,000.

The matter came before the Transit Commission at a hearing on the form of deed of sale of the company's properties, which were sold in foreclosure proceedings last summer. In this deed from the New York Railways to the New York Railways Corporation, as the reorganized company will be known, there has been omitted the Delancey and Spring Streets lines and parts of the Avenue C, Madison Street and Sixth Avenue lines, service on which was discontinued soon after the late Job E. Hedges was appointed receiver. Under the law, a receiver can discontinue service on an unprofitable line but cannot surrender the franchise, as such action can only be taken by the directors of a solvent company.

Assistant Corporation Counsel Edgar J. Kohler objected to approval of the deed without the inclusion of the discontinued lines. Mr. Kohler said that the Manhattan Surface Coach Company, which he said was a subsidiary of the New York Railways, had applied for bus franchises on the streets occupied by the discontinued lines and contended that the company wanted the city to stand the entire expense of resurfacing the streets and then permit its subsidiary to operate buses upon them.

George H. Stover, assistant counsel of the commission, also opposed the approval of the deed without inclusion of the discontinued lines. Joseph P. Cotton, counsel for the company's reorganization committee, advocated approval of the deed, as did Hugh J. Sheeran, the present receiver.

Madison Company Adopts Bus as Auxiliary

The Madison Railways, Madison, Wis., will begin on March 1 the operation of a bus line from the Capitol square to the residential district of Nakoma. This will be its first experience in the operation of buses as an auxiliary. Dudley Montgomery, vice-president of the railway, announced that three street car type buses, seating 29 passengers, would be purchased from the Yellow Coach Manufacturing Company, Chicago. The proposed schedule provides for 25 trips each way daily. It is believed that as traffic warrants bus lines will be established in other parts of the city.

Some time ago the Wingra Bus Company, Madison, applied to the Common Council for an exclusive franchise to operate buses in the city. With the proposed activity in the bus field by the railway it is generally thought that this application will not be favorably acted upon.

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News Notes

Fare Increase Deferred.—The Cleveland Railway, Cleveland, Ohio, has postponed the raising of car fares from 5 to 6 cents in Lakewood, a suburb, in accordance with a recent agreement with that city. This action was taken by the railway in view of the attitude of the City Council of Cleveland in refusing to approve the change, even for a year.

Considers Improved Service in Remote Sections.—The City Council of Portland, Ore., in a public hearing, recently discussed the problem of improving railway service in remote sections of the city, especially in the St. Johns district. F. I. Fuller, vice-president of the Portland Electric Power Company, stated that his company was willing to co-operate in any way that would give the patrons of the district the best service. He called attention to the fact that last year 4,500,000 passengers were carried on the line, with receipts of more than $250,000. The report of Commissioner Mann on proposed improvements was heard. Mr. Fuller stated that the improvements suggested in the report would cost more than $250,000, but believed the service should be given.

Must Explain Platform Extension Neglect.—The Chicago Rapid Transit Company, operating the elevated lines in Chicago, has been cited by the Illinois Commerce Commission to explain the failure to lengthen the elevated platforms in the loop district as authorized by the commission. The company has an application pending with the city for permission to extend the platforms, but action has been delayed for the last 6 months pending negotiations between Samuel Insull and Mayor Dever over the purchase of the elevated lines. The city has final jurisdiction.

Bus Operator Protests Grant to Railway.—The Columbus & Marysville Bus Company, Columbus, Ohio, has filed a protest with the State Utilities Commission against granting the Columbus, Urbana & Western Electric Railway a certificate to operate a bus line over Riverside Drive from Fishinger's Bridge, 8 miles north of Columbus, to the center of the city. The protestant claims that residents in the community north of Columbus have easy access to the city on its buses, also on city street cars and on Columbus, Urbana and Western interurban cars. There is not enough business for two bus lines, the complaint says.

Traction Solves Puzzle.—There will be no more unmerciful chewing of innocent lead pencils over a lost word on the de luxe trains of the Illinois Traction System. Cross-word puzzle dictionaries have been installed in the parlor car coaches of the Capitol Limited, the de luxe train running between St. Louis and Peoria. The sleeping car Illini, from St. Louis, Decatur and Champaign, which has reading tables, will also be equipped. The old faithful game of "rummie" is becoming a lost art among railway passengers. Every one is working cross-word puzzles, so the company is supplying dictionaries to solve its patrons' puzzles.

Bus Service Grows.—Another Pierce-Arrow de luxe passenger coach has been placed in service on the Niagara Falls - Lewiston - Queenstown route of the Gray Bus Line of Niagara Falls. This is the second of these buses placed in service over the Niagara Scenic Highway since the Niagara Falls Power Company took over the Niagara Gorge Railway, which controlled the Gray Bus Line. The company's buses are painted a very light shade of gray with vermilion trim.

Use the Trolley and Save Money.—The fact that the price of gasoline has increased in Detroit more than 44 per cent since the first of the year is pointed out by officials of the Detroit Department of Street Railways in placards on all municipal cars which carry the sign "Gas up 44 per cent; save by trolley." With the price increases put into effect by the gasoline producers and the 2-cent gasoline tax, which recently went into effect in the state when the bill was signed by Governor Groesbeck, D. S. R. officials have used the placard to advise motorists to save by using the trolley cars for city riding and leaving their automobiles at home.

Substitution of Municipal Buses for Private Ones Approved.—Plans for the operation of buses by the Seattle Municipal Railway on Tenth Avenue Northeast and branch lines in the University district have been approved by D. W. Henderson, superintendent of railways, who expresses the belief that the buses in time would yield a profit. The buses will replace those now being operated by a private concern. Under the present private operation patrons of the buses pay 10 cents cash fare with transfer, the city receiving 2½ cents of this amount. If the city takes over the buses the fare will be reduced to 8⅓ cents, with transfer privilege to the street cars.

Three-Cents-a-Mile Tickets Valid.—The Public Service Commission has approved a new regulation of the Buffalo & Erie Railway, Buffalo, N. Y., providing for the sale at all ticket offices of the company of books, each containing two one-way tickets, valid for transportation of persons presenting ticket between points named on ticket, at 3 cents per mile per trip. No ticket will be sold for a distance of less than 5 miles. This ruling became effective Feb. 20.

Contract Approved.—An application filed with the Public Service Commission by the Philadelphia Rapid Transit Company, Philadelphia, Pa., for approval of a contract with the Township of Upper Providence was considered recently. A representative of the transit company, lessee of the Darby, Medina & Chester Street Railway, explained that by payment of $13,000 the transit company was relieved of all liability with respect to the paving and maintenance of the streets in the township occupied by railway tracks. There was no protest and the matter was referred to the entire commission.

Course in Public Utilities Offered.—A new course in public utilities will be offered in the Indiana University in Indianapolis in the spring semester. The course, under the supervision of Marvyn Crobaugh, will include the history, development and present status of the industry. Besides the regular course of study there will be a series of lectures by public men familiar with public utility problems. The speakers include Martin J. Insull, Middle West Utilities Company, Chicago; Arthur W. Brady, Union Traction Company of Anderson; Dean Heilman of Northwestern University, and prominent engineers and public service commissioners.

Motorman Absolved in Accident Case.—Although held responsible by the Interstate Commerce Commission for the rear-end collision between two trains on the Buffalo-Niagara Falls high-speed division of the International Railway on Oct. 19, when many excursionists were injured, Howard Foreman, motorman of the second section, was absolved from all blame by Coroner J. E. Helwig of Tonawanda. Failure of the equipment of the car to function properly was given as the cause of the accident by the coroner.

Resolution Praises Retired President.—Charles L. Kurtz, whose resignation as president of the Columbus Railway, Power & Light Company, Columbus, Ohio, was recently referred to in the ELECTRIC RAILWAY JOURNAL, will be presented with an engrossed copy of a resolution passed by stockholders and directors of the company which expresses their appreciation of the manner in which he conducted the business of the company during his presidency. The resolution regretted the loss of his advice and interest and assured Mr. Kurtz of the well wishes of his former associates in the years to come.

Accident on Pennsylvania at Newark.—Three persons were killed and thirty-two others were injured, several seriously, when a Philadelphia local train on the Pennsylvania Railroad rammed into the rear of an Atlantic Coast Line express standing at the platform of Manhattan Transfer early on Feb. 24 on the New Jersey Meadows. The accident occurred on the electric division of the road.

Use of Tokens Extended.—The North Carolina Public Service Company is now using tokens on all of its cars in Salisbury instead of cardboard tickets. They are being sold at the same price that has prevailed for tickets, 7 cents each or four for 25 cents. Tokens have been used by the company in Greensboro for some time.

All-Night Service Unprofitable.—Operation of all-night service over the Stark Electric Railroad between Alliance and Canton, Ohio, is a losing venture, according to company officials. The service was started several months ago to accommodate railroaders who live in Alliance and report for work at the company shops near Canton. A contract between the Stark Electric Railroad and the Pennsylvania Railroad which resulted in establishing the all-night service expired Jan. 1. Railroad officials have made no move to renew the agreement.

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Buses Replace Cars.—Word has been received from Leavenworth, Kan., that all local trolley service has been suspended and five Mack 25-passenger buses are now providing the local transportation facilities. Last December the Kansas City, Leavenworth & Western Railway applied for and was granted permission to abandon street car service in Leavenworth and substitute bus service in its stead, to operate over the two routes formerly covered by the trolleys. The traction company formed a separate bus operating company known as the Leavenworth Transportation Company, which placed buses in service recently. The two routes, which are between 3 and 4 miles in length, are now being covered by the buses, operating on an 8-cent fare.

Action Prohibiting Bus Operation Restrained.—A writ restraining the county courts from taking action in the case of the Union Traction Company, Anderson, Ind., against Donald Lake and others, involving their right to operate buses in Muncie, Ind., has been issued by the Indiana Supreme Court. The case has been pending in the courts for some time.

Widow Wins Case.—A verdict of $10,000 was recently awarded to Mrs. Eva Chrampanis for the killing of her husband by a trackless trolley operated by the city of New York on Staten Island in March, 1923. The corporation counsel interposed the defense that as the city was operating illegally it was not answerable in damages. When Justice Strong had sustained the city's defense the attorney for Mrs. Chrampanis countered this move by amending the complaint so as to join Mayor Hylan and the members of the Board of Estimate and Apportionment individually as defendants. A jury before Supreme Court Justice May in Staten Island on Feb. 18 decided that the city was answerable to the widow and children.

Fare Boxes in Little Rock.—The Arkansas Central Power Company recently adopted the system of fare boxes on its cars in Little Rock, Ark. To help passengers have the exact fare ready a 6-cent token or metal ticket has been provided.

Wants Enforcement of Paving Ordinance Restrained.—Suit has been filed in the Federal court in Indianapolis, Ind., by the Terre Haute, Indianapolis & Eastern Traction Company against the city of Newcastle, John H. Morris, Mayor, and Robert S. Hunter, city attorney, asking an injunction restraining the enforcement of a city ordinance which would require the company to lay new tracks and pave a part of a street in Newcastle. The complaint alleged that the ordinance is in violation of the Federal constitution in that it deprives the plaintiff of its property without due process of law and is contrary to a contract held by the company with the State of Indiana.

Both Companies Secure Permits.—The Board of Public Service of St. Louis, Mo., following a public hearing, decided to issue permits for a bus line on West Florissant Avenue to both the People's Motor Bus Company and the St. Louis Bus Company, an auxiliary of the United Railways.

Foreign News

Auckland Uncertain About Buses

The City Council of Auckland, New Zealand, is adding to its bus equipment, but believes that "tramways remain supreme for mass transportation of dense communities of the cities." The tramway system in Auckland was taken over by the city in 1919 and serves a population of 170,000. To carry this traffic 186 cars are used and these operate over 30.35 miles of route. Though a municipal enterprise jitney buses were allowed to run, and these, with the great increase in private automobiles, have caused a strain on the finances of the tramway system.

The Council decided to put the matter before the public, and late last year published a statement giving an official review of its tramway policy. In this review the Council expresses its belief that no other vehicle can adequately or satisfactorily replace the tramway cars, so far as regards the transportation needs of 90 per cent of the community. The question, it says, is whether it is proper to allow the tramway service to be impaired by senseless competition because of the habits of the remaining 10 per cent of the population. Buses alone are inadequate to serve the situation.

The city has decided to expand its bus service. Last fall it had 10 on order and it has decided to order 20 more to take the place of any further track extensions, for the present, though 10 additional cars are to be added for the 1925 season.

Traffic Congestion a Problem in Glasgow

A traffic survey for the relief of street congestion was suggested to the members of the Glasgow Town Council, Scotland, at the annual inspection of the tramways undertakings. Referring to the suggestion to eliminate all tramways from the central area of Glasgow, ex-Bailie Laing said that instead of more than 1,000 tramcars, it would take between 2,000 and 3,000 buses to transport the people into the center of the city, and if the tramways were barred congestion would be increased. He urged the adoption of one-way streets and utilization of certain roads for fast traffic. He also suggested that the railway companies provide an electric shuttle service between the city and suburban areas.

Fares Cut on London Buses

A drastic reduction in fares was put into effect on Dec. 3 by the Association of London Omnibus Proprietors, under which so-called pirates are run. The cuts amount to approximately one-third of the previous fares.

The object of these cuts, according to A. Kemp-Gee, managing director of the Cambrian Company, is to meet the competition of the London General Omnibus Company, following its introduction of combined bus, tram and tube tickets, and combined season tickets. This competition has been further accentuated by the opening of the new section of the City & South London Railway. Mr. Kemp-Gee said in an interview that while his company could not offer similar facilities to its patrons, it could reduce fares to a point even below the monthly or quarterly season ticket rate.

It is understood that the London General Omnibus Company does not intend to take any action at present, but will proceed with its plans to offer the public a co-ordinated traffic service along the lines already outlined.

Operations Show £63,598 Balance.—The accounts of the Cape Electric Tramways, South Africa, for the year to June 30, 1924, show a profit of £81,535, and after providing for debenture interest, redemption of debentures and taking into account balance brought forward a net credit of £63,598 remains. The reserve fund has been credited with £20,000, leaving £43,598. The directors recommend a final dividend of 3 per cent, making 6 per cent, free of tax, for the year, carrying forward £14,125. During the year the tramways carried 31,794,150 passengers, with gross receipts of £398,896, as against 32,094,580 passengers, with gross receipts of £408,753, in 1922-23. Although a falling off of slightly under 2½ per cent has been experienced in traffic receipts, there is a corresponding reduction under various headings of expenditure; the net result, therefore, comes out practically the same as last year.

Franchise of Paris Transports en Commun to Be Revised.—The question of the revision of the Transports en Commun franchise was discussed at a recent meeting of the Council General of the Seine. An agreement that will be acceptable to both parties is being sought. The final proposition is that the Transports en Commun shall renounce its remuneration of one-fourth of 1 per cent on receipts exceeding 250,000,000 francs, the bonus on economies exceeding 0.85 of 1 per cent of the receipts, a quarter of the bonus running from 0.85 to 0.95 of 1 per cent, half of the bonus between 0.90 and 0.95 and three-fourths of the bonus exceeding 0.95 of 1 per cent of the receipts. The economies resulting for the Department of the Seine by this new agreement are expected to amount to approximately 500,000 francs during 1925. The franchise now in effect was outlined previously in these columns.

Japanese Electric Railway Plans Changed.—The franchise right for construction of underground railways in Tokyo, Japan, has been canceled by the Tokyo government. The franchise was formerly held by the Musashi Electric Railway. This company has been reorganized as the Tokyo-Yokohama Electric Railway and proposes to build a suburban railway from Tokyo to Yokohama.

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Financial and Corporate

$3,000,000 Philadelphia Stock Issue

Passenger Partnership Campaign Started by Mitten Management to Secure Additional Funds

Users of the service of the Philadelphia Rapid Transit Company, Philadelphia, Pa., are being afforded an opportunity to become stockholders of that company under a new plan which makes investment easy. It is explained that the issue which the car riders are to be permitted to buy is to consist of $3,000,000 of preferred stock paying a 7 per cent cumulative dividend. It is to be split up into 60,000 shares with a par value of $50 each. Passengers are to be permitted to apply for from one to ten shares. The proceeds from the sale of the stock will be used to finance extensions and additions to property and to retire or acquire prior obligations. It is explained that the earnings applicable to the preferred dividends for 1925 appear to be more than 15 times the sum necessary to pay them. In this connection the company says that "conservative bankers consider a preferred stock a good investment where the dividend is earned only three times."

After the stock has been allotted purchasers will be permitted to pay for it in full in cash or at the rate of $1 per share per month. The partial payment plan is intended to make it easy for men and women who desire to save as they go to become part owners in the property. P. R. T. employees asked the right to buy the preferred stock, but they have agreed to wait until the car riders have had the first opportunity to buy.

Men and management at Philadelphia together now own more than one-third of the common stock of the company, through which ownership they may subscribe to more than one-third of the preferred stock. They have waived this right so that more than $1,000,000 of the new preferred stock will be available for sale to the car riders as soon as it has been authorized and issued. All other stockholders will be asked to give up their rights of subscription so that all of the $3,000,000 issue may be sold to the car riders.

As to the partial payment plan, the payments will be due each Saturday, but it is explained that they can be made on any week day or for as many weeks in advance as desired. Should any payment become 5 days overdue all money paid in up to that time will be returned and the stock will be sold to another purchaser. Receipts will be issued for each payment and when $50 per share has been paid the stock certificates will become the property of the purchaser or subscriber.

It is intended to pay dividends of $1.75 per share every six months. The stock will be redeemable at $55 per share. Application will be made to list the stock on the New York and Philadelphia exchanges so that a ready market will be available for the issue at all times.

Another Property Passes to Mr. Insull

Samuel Insull, Chicago, and interests represented by him have arranged to purchase the entire system of the Indiana Service Corporation, including both the local city lines in Fort Wayne, Ind., and the three interurban systems operated by the local company. Formal transfer of the company has not yet been completed, but according to an announcement made on Feb. 20, all the details of the transaction were completed some time ago. Robert M. Feustel, president of the company at Fort Wayne, has made this plain.

It was reported in Fort Wayne that the Insull interests paid practically par for the entire preferred and common stock holdings of the local company, but confirmation of the terms of the sale has not been made. Mr. Feustel says the company will continue to function as a local organization, with much the same staff for the present at least.

In addition to the city lines in Fort Wayne, the Indiana Service Corporation operates the city lines in Wabash, Peru and Logansport and the interurban lines to Lafayette, Bluffton, Waterloo and Kendallville. Its properties also include the light and power plants which supply Fort Wayne.

San Francisco Municipal Loss $295,230

For the Year Ended June 30, 1924, the Excess of Income Over Operating Expenses and Reserves Was $8,374, but Taxes and Similar Items Amounted to $303,604

TOTAL revenue of the Municipal Railway, San Francisco, Cal., for the year ended June 30, 1924, was $3,189,533, and interest on securities owned increase this by $46,519 to $3,236,052. Deducting operating expenses of $2,460,282 left a net of $775,770. Against this $196,223 was charged interest on funded debt and $571,173 for depreciation and accidents, leaving a balance of $8,374, compared with $13,830 for the previous year.

For the purpose of securing a comparison between the results of operation of the municipally owned utility and those operated by private capital, the charter of the city and county of San Francisco provides that the operating reports shall include certain comparison charges consisting of items which constitute part of the actual cost of operating private-owned companies, but which the municipally owned utility is not required to pay. For the year these charges amount to $303,604, leaving a net deficit of $295,230. This compares with a similar deficit for the preceding year of $272,045.

There has been a continuing deficit, as shown by the cumulative income account for the period from Dec. 28, 1912, to June 30, 1923, amounting to $1,024,-

COMPARATIVE INCOME ACCOUNT, SAN FRANCISCO MUNICIPAL RAILWAY

	Years Ended June 30 1923	Years Ended June 30 1924	Dec. 28, 1912 to June 30, 1924
Passenger revenue	$2,993,829	$3,173,181	$25,415,189
Miscellaneous revenue	11,372	16,352	110,356
Total revenue	$3,005,201	$3,189,533	$25,525,545
Interest on securities owned	55,297	46,519	316,674
Total income	$3,060,498	$3,236,052	$25,842,219
Operating expenses:			
Way and structures	$109,572	$115,468	$799,920
Equipment	216,605	187,636	1,495,486
Power	424,695	465,889	3,369,704
Conducting transportation	1,371,843	1,523,269	11,000,120
Traffic	16	109	3,836
General and miscellaneous	179,325	167,911	964,369
Loss on road retired			8,187
Total operating expenses	$2,302,055	$2,460,282	$17,641,622
Excess of income over operating expense	$758,443	$775,770	$8,200,597
Less interest on funded debt	205,724	196,223	2,374,963
Excess of income over operating expenses and interest	$552,719	$579,547	$5,825,634
Less reserve for depreciation and accidents (18 per cent of gross passenger revenue)	538,889	571,173	$4,573,836
Excess of income over operating expenses, interest, depreciation and accident reserves	$13,830	$8,374	$1,251,798
Less charter comparison charges	285,876	303,604	2,276,184
Net income	*$272,045*	*$295,230*	*$1,024,386*
Analysis of comparison charges:			
*State franchise tax—4½ per cent of gross earnings	$157,775	$167,442	$1,338,556
†Municipal franchise tax—3 per cent of gross earnings	119,753	126,928	824,158
Municipal car license	2,835	3,135	30,258
Federal income tax	.....	.....	13,270
Salary of clerks	.....	.....	4,872
Law expenses	.....	.....	13,560
Insurance	5,513	6,099	51,570
Total	$285,876	$303,604	$2,276,184

* Franchise tax percentage has varied in different years. † Municipal franchise tax now increased to 4 per cent. Italics indicate loss or deficiency.

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STATISTICAL DATA, SAN FRANCISCO MUNICIPAL RAILWAY
FISCAL YEAR ENDED JUNE 30, 1924

	Total Amount	Per Car-Mile (Cents)	Per Car-Hour	Ratio to Passenger Revenue
Total passenger revenue	$3,173,181.33	36.57	$3.5249	.....
Total operating expenses (taxes and depreciation not included)	2,460,282.85	28.36	2.7330	.....
Total operating earnings (taxes and depreciation not included)	712,898.48	8.21	0.7919	0.2246
Total taxes and charter charges	303,604.17	3.50	0.3373	0.0957
*Depreciation	571,172.64	6.58	0.6345	0.1800
Operating expenses, depreciation and taxes	3,335,059.66	38.44	3.7048	1.0510
Net deficit from operation	*161,878.33*	*11.87*	*0.1798*	*0.0610*
†Passenger car mileage	8,676,611			
‡Passenger car-hours	900,224			
Platform expense (62½ cents per hour July 1, 1923, to Sept. 15, 1923, inclusive; 67½ cents per hour Sept. 16, 1923, to June 30, 1924, inclusive; bus operators 72½ cents)	1,269,472.65	14.63	1.4102	

	Total Amount
Number of passenger cars owned	209
Number of work cars owned	4
Total number of cars owned	213
Total number of buses owned	10
Total single-track mileage	68.98
Passengers carried—5-cent fares	62,954,052
5-cent fares—Government tickets	46,950
2½-cent fares—school tickets	995,854
2-cent revenue transfers	327,436
Free transfers	12,808,537
Free passengers (employees, etc.)	603,788
Total passengers carried	77,736,617
Number of passengers carried per car-mile	8.96

* The sum of $200,000 expended from depreciation reserve for bond retirement. † Includes mileage of buses. ‡Includes car-hours of buses. Italics indicate loss or deficiency.

386, when the comparison charges are included. Neglecting these, there has been an excess of income over operating charges, interest and reserves of $1,251,798 for the same period.

Particular attention is given in the report to the explanation of the items in the balance sheet, which is reproduced in condensed form herewith. The capital assets consist of cash in bond funds, $17,428, which represents unexpended balance of the bond fund cash now in possession of the treasurer; road and equipment, $7,570,225, and general expenditures, $324,873. These latter accounts represent the total cost of the road and equipment.

The current assets consist of $943,635 cash in various funds, $979,325 for the book value of the securities bought for the account of the depreciation fund; accounts receivable, $14,148; materials and supplies, $237,815.

Deferred assets have not changed during the year.

On the liabilities side, the funded debt item represents the par value of the bonds outstanding in the hands of the public on June 30, 1924. Current liabilities include accounts and vouchers payable, $221,946, and interest due on funded debt, $47,773. The reserves include a reserve for depreciation of $1,467,977 and a reserve for compensation insurance of $100,492.

The municipal railway has no capital stock and the excess of its assets over its liabilities represents surplus. In the preparation of the balance sheet, it is stated, this surplus has been divided into two classes, first, that which was created by donations or contributions, and, second, that which was accumulated from the earnings resulting from the operation of the road. The contributed surplus includes premiums realized from the sale of bonds, $26,000, and contributions from general taxes, $306,552. In surplus from income is included $1,489,000 representing bonds retired from income; $101,000 reserve for bond redemption. These amounts, totaling $1,590,000, represent the income which has been set aside in cash for the redemption of bonds.

An item of considerable interest to railway operators is the charter reserve of $903,802 for insurance and taxes. As explained previously, there are set aside certain sums for comparison with private operation, of which this item is a part. The municipal system not having to pay any of these charges, the receipts from operation were deposited in the operating cash fund without any restrictions as to how they were to be used. As a matter of fact, however, most of the cash in the operating fund represented by such comparison charges actually was expended in new construction and addition and betterment work, so that these reserves, representing obligatory charter comparison charges, have in reality been used as reserves for betterments.

For the purpose of making the balance sheet reflect the actual results of operations, it is stated, the amount expended in addition and betterment work has been reflected in an account entitled "additions and betterments from income," and the charter reserves for insurance and taxes carry a balance equal only to the unused portion of the original income. The amount in the additions and betterments account is $2,199,388.

Operating surplus is made up as follows:

Surplus, June 30, 1923, as per last report	.....	*$484,477*
Add:		
Reduction of compensation insurance reserve corresponding to dividends declared by the state compensation insurance fund applicable to year ended June 30, 1924	$14 946	
Transfers from depreciation fund to operating fund as follows:		
Deficits in operating fund	60 639	
Insurance refund credited to accident insurance reserve but deposited in operating fund	1 679	77 264
		$407 213
Deduct:		
Amount transferrable from income account	$295 230	
Interest on bonds credited to income but deposited in depreciation fund	46 519	
Adjustment reconstruction of lower Market Street tracks	19 518	361 267
		$768 481

Italics indicate loss or deficiency.

STATEMENT OF BUS LINE OPERATIONS, SAN FRANCISCO MUNICIPAL RAILWAY, YEAR ENDED JUNE 30, 1924

Revenues:		
Passenger revenue	$33,323	
Quartermaster tickets	5	
School tickets	639	
Local transfers	11,356	
Total revenues		$45,323
Operating Expenses:		
Repairs to buses	$12,445	
Tire expense	10,350	
Garage expense	13,317	
Conductors and chauffeurs	21,936	
Depreciation (18 per cent of gross passenger revenue)	5,998	
Compensation insurance	1,138	
Total operating expenses		65,184
Net loss for year		$19,861
Average net loss per day		54.26

COMPARATIVE CONDENSED GENERAL BALANCE SHEET, SAN FRANCISCO MUNICIPAL RAILWAY, AS OF JUNE 30, 1924

Assets	1924	1923	Increase or *Decrease*
Capital assets	$7,912,526	$7,610,138	$302,387
Current assets	$2,174,925	$2,241,396	*$66,470*
Deferred assets	$132,124	$132,122	.....
Total assets	$10,219,575	$9,983,659	$235,916
Liabilities, Reserves and Surplus			
Funded debt	$3,992,000	$4,192,000	*$200,000*
Current liabilities	$269,720	$343,126	*$73,406*
Reserves	$1,568,469	$1,615,740	*$47,270*
Contributed surplus	$332,552	$332,552	
Surplus from income	$4,056,832	$3,500,238	$556,594
Total surplus	$4,389,385	$3,832,791	$556,594
Total liabilities, reserves and surplus	$10,219,575	$9,983,659	$235,916

Italics indicate loss or deficiency.

The statement of bus line operations for the year shows total revenues of $45,323, compared with $39,875 last year, and expenses of $65,184, compared with $61,302 the previous year, giving a net loss for the year of $19,861, compared with $21,427. In 1922 the net loss was $29,086 on a total gross of $38,863. These figures, however, do not include any supervision or other overhead or comparison charges.

Customer Ownership Campaign on in St. Joseph

The St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., started its second customer-ownership campaign on Feb. 16 to be in effect until Feb. 28. The security is preferred stock of the Cities Service Company, which controls the St. Joseph property. The employees are all interested in making the campaign more successful than last year's and are anxious to exceed their sales by a substantial number. The New York office has set the St. Joseph quota at 2,500 shares. An offer of $7,000 in prizes and commissions has been made to employees who sell the greatest number of shares.

Twelve important steps in selling the Cities Service preferred stock were outlined in the February number of "Rylite Employees' News," the company's official publication. The employees were advised to tell the prospect that his purchase would make him part owner of the company's substantial properties and that he would share in the company's earnings.

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January a Record Month for Boston "L"

The Boston Elevated Railway, Boston, Mass., reports the largest surplus for any January since the road was turned over to public trustees.

In submitting his report for the month Edward Dana, general manager, says that the savings were accomplished by the most rigid economy and without curtailment or impairment of service. The company carried 33,305,311 passengers, received from all sources $3,130,996 and paid out $2,861,347, which leaves an excess of receipts over cost of service of $269,649. The natural increase in wages from the arbitration award would have been $40,000, but the actual increase was only $1,400 because 400 employees were laid off and the repair shops were put on a 5-day basis.

	1925	1924
Revenue passengers:		
10-cent passengers	26,813,722	25,079,496
5-cent passengers	1,138,715	9,337,482
6-cent passengers	5,352,874	.....
Total revenue passengers	36,305,311	34,416,978
Total receipts per revenue passenger	9.401c.	8.855c.
Receipts from fares per revenue passenger	9.186c.	8.643c.
Cost of service per revenue passenger	8.591c.	8.490c.
Total payroll included in operating expenses	$1,453,173.97	$1,451,724.35
Payroll cost per revenue passenger	4.363c.	4.218c.

By increasing the safety factor, operating more safely, reducing accidents and incidentally accident insurance, the company cut its expenses for the law department, injuries and damages and insurance from $141,310 in January, 1924, to only $77,431 last month. Coal was bought at an average figure of $5.37 per ton as against $6.30 per ton a year ago, and the consumption was reduced by the higher efficiency engines, from 27,326 tons in January a year ago to 25,445 tons in January of this year.

Purchases Interurban Tracks

The City Commission of Dallas, Tex., recently gave the Dallas Railway permission to requisition $123,675 to purchase the Forney Avenue line from the Texas Interurban Railway. The company will give a note for the purchase price and pay the interest out of the company's authorized 7 per cent return on property values.

This line was built by the interurban company for the Terrell-Dallas line, but the Dallas Railway rented the trackage for local service. Under the new arrangement the Dallas Railway will have title to the lines and the Texas Interurban Railway will pay an annual rental of $3,000 for the interurban service.

Valuation of New York State Railways Reduced

The city of Rochester has reached an agreement with the New York State Railways in its long-pending suit for a reduction of the base valuation of the Rochester lines of the company, whereby the value under the service-at-cost contract will be cut from $19,216,000 to $18,076,000, a reduction of $1,140,000.

The figure agreed upon represents a compromise on the part of both parties, as the railway some time ago offered to reduce the value by $1,005,000. This proffer was rejected. The matter now is before the Common Council and acceptance is said to be assured.

The amount of the reduction, Corporation Counsel C. M. Platt said, is too small to allow any immediate reduction in the present 7-cent fare. Under the service-at-cost contract the railways must show a surplus of $200,000 in its balancing accounts before a fare cut is possible. The railways for the 4 years of operation under the contract have failed to show such return.

Dividends and Directors in Brooklyn.—The Brooklyn City Railroad, Brooklyn, N. Y., declared a quarterly dividend of 20 cents, payable March 2 to stock of record Feb. 14. Three months ago the company declared a quarterly dividend of 20 cents and 5 cents extra. Thomas I. Parkinson, vice-president of the Equitable Life Assurance Society, and Clinton E. Morgan, vice-president and general manager of the road, were elected directors.

Contract Agreement Reached.—Agreement over the question of valuation has finally been reached between the officials of the Milwaukee Electric Railway & Light Company and the public utilities acquisition committee, which are negotiating the proposed service-at-cost contract. It places a valuation of the company's properties at $56,456,506 as of July, 1925, the date when the contract is to become effective, providing the vote is in favor of the plan. This figure will be replaced by the exact amount determined when the audit of the company's books is completed up to that time. The audit is now completed up to Jan. 1, 1922, which establishes a valuation at that time of $42,382,000.

Receipts Higher in January This Year.—Total passenger revenues of the Indianapolis Street Railway, Indianapolis, Ind., for January were $449,657. This is a decrease of $17,091 compared with the previous month, but contrasted with total receipts for January of last year revealed an increase of $21,683.

Railway Included in Merger.—The Maine Public Utilities Commission recently rendered a decision authorizing the Bangor Railway & Electric Company, Bar Harbor & Union River Power Company, the Bangor Power Company and the Lincoln Light & Power Company to consolidate with the Bangor Hydro Electric Company.

No Intervention for Protection Necessary.—When the time arrives for a settlement under the reorganization of the United Railways of St. Louis all judgment creditors of the company prior to the receivership will have an opportunity to protect their interests. Federal Judge Faris so informed John V. Lee, counsel for judgment creditors holding claims for $129,000 against the company. Judge Faris overruled Counsel Lee's request to intervene in the receivership suit. The court told Mr. Lee there was no necessity for him to intervene as all those interested in the reorganization would receive proper consideration. In overruling a similar motion many weeks ago Judge Faris stated he had been assured the judgment creditors would be paid off in full when the reorganization was accomplished.

Railway at Public Sale.—The Phoenixville Trust Company as trustee for the bondholders will offer at public sale on March 11, 1925, at the Phoenix Hotel, Phoenixville, Pa., all the property of the Phoenixville, Valley Forge & Strafford Electric Railway, a 4½-mile trolley. Included in the sale will

Conspectus of Indexes for February, 1925

Compiled for Publication in this Paper by

Albert S. Richey
Electric Railway Engineer
Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Feb. 1925 **7.17**	Jan. 1925 **7.17**	Feb. 1924 **6.93**	May 1921 **7.24**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	Feb. 1925 **153.1**	Jan. 1925 **150.3**	Feb. 1924 **163.2**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Feb. 1925 **221.0**	Jan. 1925 **221.0**	Feb. 1924 **217.4**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Jan. 31 1925 **5.04**	Dec. 31 1924 **4.82**	Jan. 31 1924 **4.80**	July 31 1920 **11.12**	July 31 1924 **3.19**
U. S. Bank Clearings Outside N. Y. City (Billions)	Jan. 1925 **18.53**	Dec. 1924 **18.45**	Jan. 1924 **16.86**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number	Jan. 1925 **2344**	Dec. 1924 **1911**	Jan. 1924 **2231**	Jan. 1924 **2231**	Sept. 1924 **1277**
Liabilities (Millions)	**64.01**	**57.77**	**122.95**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	Feb. 1925 **209.7**	Jan. 1925 **210.4**	Feb. 1924 **220.3**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Jan. 1925 **160.0**	Dec. 1924 **157.0**	Jan. 1924 **151.2**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Feb. 1 1925 **13.89**	Jan. 1 1925 **13.93**	Feb. 1 1924 **13.20**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Feb. 1 1925 **204.6**	Jan. 1 1925 **202.6**	Feb. 1 1924 **191.1**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Jan. 1925 **154.3**	Dec. 1924 **151.5**	Jan. 1924 **149**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Jan. 1925 **167.1**	Dec. 1924 **166.1**	Jan. 1924 **164.6**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials.

Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

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be Pleasure Park, near Valley Forge, and about 12 acres of land. The road runs from Main and Church Streets, Phoenixville, Pa., to the village of Valley Forge and the Pennsylvania State Park, embracing the encampment grounds of Washington's army. Early last year it was stated that no buyer for the road could be found and the creditors' committee had decided that it would be best for the bondholders to purchase it and sell it for scrap.

Changes in Effect to Improve Business.—Receiver Henshaw of the Oklahoma Railway, Oklahoma City, Okla., has purchased the Katy railway passenger station at Guthrie with four and one-half blocks of yards and 7,000 ft. of railroad track by the Oklahoma Railway for $10,000. The purchase is to enable the electric railway to increase freight business. The receivers have outlined a reorganization plan calling for the expenditure of $50,000 on the Guthrie division, which is expected to reduce annual operating cost of that division by more than $40,000.

January Shows Profit. — January operations of the Community Traction Company, Toledo, Ohio, resulted in a profit of $14,952 for the stabilizing fund. Gross earnings were $334,874 and operating expenses $257,433, leaving a net profit of $77,441. Non-operating income added $3,035. Bond interest was $36,390 and the sinking fund requirement $22,512. This left $21,400 applicable to preferred dividends and stabilizing fund. Dividends on the preferred stock outstanding were $7,153.

Seeks Abandonment Permission.—The Pennsylvania-Ohio Electric Company, Youngstown, Ohio, has asked the Public Service Commission to permit it to abandon its railway between Hubbard, Ohio, and New Castle, Pa.

Dividend Suit Dismissed. — Suit to force distribution of nearly $2,000,000 as dividends to stockholders of the Chicago City Railways, Chicago, Ill., has been thrown out of court by the federal appellate judges who upheld a lower court ruling which involved the validity of the 1907 traction ordinances of Chicago.

City May Retire from Interests Outside City.—The city of Winnipeg, Man., will confine its traction activities to Winnipeg proper and retire from adjacent municipalities under a plan which has been submitted to the City Council and shareholders of the Winnipeg Electric Company, according to a recent report. If the plan is accepted by the city and the shareholders competition between the city and the company in the street railway business will be eliminated. The city would also buy the company's surplus current. Early in the present year it was said that a special committee might be appointed by the new City Council to consider the advisability of taking over the railway from the Winnipeg Electric Company.

Electric Branch Line Under Consideration.—The Philadelphia & Reading Railway is negotiating for the purchase of the Princeton branch of the New Jersey & Pennsylvania Traction Corporation, Trenton, N. J., for a freight line between Trenton and Princeton.

Personal Items

C. A. Brooks Leaves Poughkeepsie

Manager There Joins Fitkin & Company, Bankers and Utility Operators, in Charge of Railway Properties

Charles A. Brooks, general manager of the Poughkeepsie & Wappingers Falls Electric Railway, Poughkeepsie, N. Y., for the J. G. White Management Corporation, will on March 1 become associated with the general engineering and management corporation of A. E. Fitkin & Company, New York City, in charge of its electric railway properties. The Fitkin holdings include both city and interurban lines.

Mr. Brooks went to Poughkeepsie in April, 1913, after having served as a member of the J. G. White staff in New York. He had been identified with the traction business since 1902, when he entered the employ of the Brooklyn Rapid Transit Company. Later he was with Sanderson & Porter, New York, but left their employ to enter the service of the Third Avenue Railroad, New York City. Then followed a period in which he directed the construction of the South Shore traction lines in Long Island, and in 1912 he joined the staff of the White Corporation as a special engineer.

C. A. Brooks

Since he went to Poughkeepsie Mr. Brooks has been in charge of the railroad there except during the period from May, 1922, to November, 1923, when he was associated with Ward S. Lent in the Lenbrook Motor Corporation. Upon the death of R. J. Morrison, who had succeeded him as manager at Poughkeepsie, Mr. Brooks returned to his old position.

Under his direction the company at Poughkeepsie has purchased and put into operation an entire new equipment of rolling stock and has virtually rebuilt its lines. Ninety-five per cent of its trackage and pavement within the city has been replaced since 1913, under his personal direction.

Mr. Brooks has been president of the local Chamber of Commerce for nearly two years. In addition he is president of the Poughkeepsie Automobile Club, and is affiliated with many other local organizations. He is a member of the Amrita, Poughkeepsie Rotary, and Dutchess Golf and Country Clubs, and of the Transportation Club of New York City. He is a Knight Templar.

The Poughkeepsie *Eagle-News* said:

> Mr. Brooks has demonstrated that he is a man of high capabilities and of outstanding public spirit. As manager of the railway he has filled one of the most difficult positions in the community. He has had to contend with the same conditions which in other cities have made the operation of traction lines an exacting business in the last decade. Mr. Brooks succeeded in increasing the efficiency of service, despite formidable handicaps, and under his supervision the physical property of the company has been almost entirely rebuilt. Any fair review of his management must concede that he has done an extraordinarily fine piece of work. Mr. Brooks's services to the city through the Chamber of Commerce have been likewise notable.
>
> Mr. Brooks takes up his new duties with a background of experience which will serve him in good stead. Poughkeepsians will be glad that he has obtained at least a part of that experience in this city, and will wish for him the success which they are sure will be his.

Chicago Officials Advanced

At the annual meeting of the Chicago Rapid Transit Company, Chicago, Ill., operating the Elevated lines there, the title of B. J. Fallon was changed to vice-president in charge of operations. H. A. Johnson was given the title of general manager.

Mr. Fallon has been general manager since the summer of 1921. His promotion at that time had been the second within a period of a little longer than a year, his other positions being those of assistant general manager and engineer maintenance of way. His record of efficiency and achievement was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of July 9, 1921.

H. A. Johnson, who now assumes the rôle of general manager, has also had a notable career in the railway field. He was formerly assistant to the general manager of the Chicago Rapid Transit and superintendent of shops and equipment of the Chicago, North Shore & Milwaukee Railroad. He was a member of the committee from the American Electric Railway Association sent abroad last year to study foreign practice. Recently, he was appointed director of research of the American Railway Association to take full charge of an extensive investigation of power brakes for both passenger and freight trains. The details of his career were published in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, 1924.

S. B. Way, vice-president and general manager of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been elected president of the Peninsular Power Company, the properties of which were recently acquired by the North American Com-

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pany. A. K. Ellis, general superintendent of the Wisconsin Traction, Light, Heat & Power Company, has been named vice-president, and F. J. Boehm, secretary and treasurer.

Wallace Shaw has succeeded Joseph P. Hines as general manager of the Nahant & Lynn Street Railway, Nahant, Mass. Thomas Fee is roadmaster, replacing Arthur Hollis.

J. Sandie has succeeded Alexander McCready, deceased, as master mechanic of the Sault Ste. Marie Traction Company, Sault Ste. Marie, Mich. J. H. Stewart has succeeded J. N. Franz as superintendent.

L. H. McCray, formerly assistant general manager of the East Penn Electric Company of Pottsville, Pa., has been elected vice-president of the New Hampshire Electric Railways. He will be in charge of the operation of the Massachusetts Northeastern Street Railway and the Dover, Somersworth & Rochester Street Railway in addition to light and power properties. Ralph Hood will continue as manager of the Massachusetts Northeastern Street Railway and the Dover, Somersworth & Rochester Street Railway.

J. P. Hudson, auditor of the Niagara, St. Catherines & Toronto Railway, St. Catherines, Ont., has had his jurisdiction extended to include the accounts of the Toronto Suburban Railway. Mr. Hudson will report direct to T. H. Cooper, general auditor, Montreal. H. J. Harris has been appointed assistant auditor with office at Lambton, Toronto, Ont.

Carl C. Jones has been promoted to division ticket and freight agent of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind. This is a newly created office, to supervise all freight, express and baggage business which heretofore has been connected with the railway baggage department. The new arrangement separates the freight service entirely from the transportation department, which will allow M. M. Nash, superintendent of transportation, and his workers an opportunity to devote their entire time to traffic and transportation problems.

O. S. Hanson was elected treasurer of the Grand Forks Street Railway, Grand Forks, N. D., at the recent annual meeting. In this capacity he succeeds A. I. Hunter.

C. F. Crane, assistant to the president of the Harrisburg Railways, Harrisburg, Pa., was recently elected treasurer of the Pennsylvania Street Railway Association. At the same meeting Harold A. Buch was elected secretary. Mr. Buch was an assistant to the late Henry M. Stine, secretary and treasurer of the association.

Capt. W. V. Morland, manager of the Nottinghamshire & Derbyshire Tramways and the Midland General Omnibus Company, Nottinghamshire, England, has been appointed manager of the St. Helens Corporation Tramways.

Clarence Kline, purchasing agent, claim agent and superintendent of the Enid City Railway, Enid, Okla., is now vice-president of the Tulsa Street Railway, Tulsa, Okla. Mr. McGrath succeeded Mr. Kline at Enid.

E. W. Dickinson is retiring from the post of power station engineer of the London County Council Tramways, London, England, and will receive a retiring allowance. He has been on the permanent staff since 1906.

Obituary

F. P. Maize

F. P. Maize, master mechanic of the Portland Electric Power Company, Portland, Ore., since 1911, died recently. Mr. Maize was in the railway field for many years, his first connection being in the shops of the Carlisle Manufacturing Company, locomotive builders, which he served from 1885 to 1893. He then became foreman of the machine shop of the Atlantic Avenue Railroad in Brooklyn and a year later accepted a position with the Scranton traction company.

It was at the time he was connected with the Scranton property that Mr. Maize took up the study of the subject of mechanical and electrical engineering. This equipment enabled him to perform with even greater zeal the duties of foreman of repair shops of the second division of the Union Traction Company, Philadelphia. Each position seemed to fit him for something higher and a year later he became master mechanic of the New York & Queens County Railway, Long Island City, later being promoted to superintendent of power houses and equipment.

From 1903 until the summer of 1908 Mr. Maize was master mechanic of the Rochester Railway, in the latter year resigning to become a mechanical instructor of the Public Service Corporation of New Jersey and in general charge of the repair shops of the company throughout New Jersey. He next moved to Portland, Ore., where he has been employed for the past 14 years.

Job E. Hedges

Job E. Hedges, humorous speaker, political philosopher, lawyer and former receiver of the New York Railways, New York City, died at his rooms in the Chalfonte Hotel at Atlantic City, N. J., on Feb. 22. The death, which was sudden, was caused by heart disease, of which Mr. Hedges has suffered several previous attacks. He was 62 years old.

In 1914 Mr. Hedges was defeated for Governor of New York by William Sulzer, the Democratic candidate. After Mr. Sulzer's impeachment and the succession of the late Martin H. Glynn to the Governorship, Mr. Hedges became a candidate for the nomination again in 1914.

The New York *Times* said that in the opinion of many of his friends, Mr. Hedges' reputation as a humorist was a decided handicap to him politically, and that it was certain his reputation as a wit prevented many epigrams of political philosophy of his being taken with the seriousness that they deserved.

Mr. Hedges always took an active part in Republican State and national conventions. He placed Charles E. Hughes in nomination for Governor in 1906 and supported Mr. Hughes in the campaign.

In a speech at a dinner of the University of Vermont alumni, he said:

> The only difference between the Governor of Vermont and the Mayor of this city is that the Governor says nothing and does a whole lot while the Mayor says a whole lot and does nothing. When the Mayor has more to say than usual he seeks redress in the City Record.

Mr. Hedges' wit continued undimmed by failing health. When criticised by Mayor Hylan for action as a surface railway receiver, Mr. Hedges retorted by referring to the Board of Estimate and Apportionment as "a board that neither estimates nor apportions."

C. M. Murdock

Charles M. Murdock, Lafayette, Ind., vice-president of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., died of heart disease Feb. 8 at his home in that city. He had been ill several years. The day prior to his death he visited the First Merchants National Bank, Lafayette, of which he was chairman of the board of directors, but that night appeared restless and at 7 o'clock, when the nurse tried to awaken him, she found he was dead. He was 60 years old.

With his father and brother Mr. Murdock organized the first gas company in Lafayette and later the Lafayette Lighting Company. These utilities are now combined as the Northern Indiana Gas & Electric Company. He and his brother also were pioneers in interurban development. They became interested years ago in the Terre Haute, Indianapolis & Eastern Traction Company, the Fort Wayne & Wabash Valley Traction Company, the Evansville & Southern Traction Company and the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway. Mr. Murdock also was interested in several banks.

William M. Lawyer, connected with the E-Z Car Control Corporation, Turnstile Car Corporation and Haller-Powers Printing Company, Syracuse, N. Y., is dead. Mr. Lawyer was born in Oswego County, New York, on June 19, 1874. After being educated in public schools of his native district he worked for the Buffalo, Rochester & Pittsburgh Railroad and later entered the employ of the New York Central Railroad, continuing with the latter until he had completed 10 years of service. He then went to Cleveland, Ohio, where he was associated with the Whitmore Manufacturing Company, manufacturers of lubricants, as salesman and Eastern representative for 16 years. Next he engaged in manufacture and distribution of railroad supplies in Syracuse and in March, 1922, he helped to organize the Turnstile Car Corporation.

Edward W. Gross, treasurer and general manager of the Berlin Street Railway, Berlin, N. H., died recently in Auburn, Me. In the early '80s in Lewiston and Auburn Mr. Gross organized the American Light & Power Company, becoming treasurer and manager. Twenty-two years ago he secured control of the Berlin Street Railway and as treasurer and general manager devoted all his energy to putting the company on a sound financial basis. Mr. Gross was 87 years old.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Jacksonville Coal Agreement Stimulates Non-Union Mining

The Jacksonville agreement between bituminous coal operators and the United Mine Workers is not working out in an entirely satisfactory manner, according to the opinion in well-informed quarters in Washington. It is stimulating greatly the production from non-union mines. One effect is the keeping in operation of inefficient mines in non-union territory and closing efficient mines in the union area. Nevertheless, the alternative to the Jacksonville agreement was a strike, and the present situation is preferable to one which would have followed such a course.

The union probably is not ready to concede it, but the trend among the men is to make wage concessions. It is regarded as entirely preferable that this suggestion should come from the men rather than from their employers. The coal industry, however, still is reaping the harvest, it is declared, of war distortions, of transportation inefficiencies and of the mismanagement which characterized the decade preceding the Jacksonville agreement.

Buses to Be Exhibited at Boston Show

Buses will constitute a substantial and special feature of the annual Boston Automobile Show in Mechanics Building on March 7 to 17. Many different sizes and types will be displayed. Some exceptionally fine buses are being built for service in New England this spring, and some of them will be on display at the Boston show before they are placed in service.

Gould Coupler Taken by Symington Interests

The Gould Coupler Company, New York, has been purchased from Charles J. Graham of the Graham Bolt & Nut Company by a banking group acting in behalf of interests connected with one of the largest railway supply companies. Announcement to this effect was made on Feb. 6. On Feb. 10 it was made public that the purchase of the Gould Coupler Company and the Gould Storage Battery Company was for the Symington interests.

Confirmation of these changes and of other details of the proposed new financing was obtained through Blair & Company, New York, on Feb. 26. At that time public offering was made of 175,000 shares of participating Class A shares of the Gould Coupler Company of Maryland. This company has acquired the plants, equipment, patents, trade names, etc., of Gould Coupler Company, a New York corporation, as a going concern. The business of the company was started 43 years ago under the title of Gould & Stimson. In 1890, the Gould Coupler Company was incorporated in West Virginia, and was succeeded in 1903 by a corporation of the same name chartered in the State of New York.

Simultaneously with this move, Charles A. Gould, who has been president of the company since its inception, is retiring from business at the age of 76 years and has been succeeded as president by his son, William S. Gould, who has been identified with the business for many years as vice-president. The executive and operating personnel will continue as heretofore with no other material change.

The Symington Company is acquiring a majority of the common shares of the new Gould company.

Electric Locomotive Shipments $3,500,000

Shipments of electric locomotives for the quarter ended Dec. 31, 1924, totaled 167, valued at $901,342, against 148, with a value of $738,540, for the quarter ended Sept. 30. Shipments for the year 1924 were 655, valued at $3,483,150, against 1,334, worth $6,221,170, in 1923. These figures are in accordance with the findings of the Department of Commerce.

Upward Trend of Gasoline Prices Quite Natural

A table of tank-wagon prices compiled by Dow, Jones & Company, New York, for 30 principal cities of the United States, shows an average price for gasoline was 15.6 cents a gallon on July 29, 15.21 cents on Aug. 29, 14.44 cents on Sept. 17, 14.64 cents on Sept. 20 and 13.59 cents a gallon on Oct. 3. It is explained that this steady decline was brought about by cheapness of crude, which, in turn, was attributable to overproduction that during the year added 19,843,000 bbl. to the 333,053,000 already held in storage at the end of

With the recent falling off in production and the improvement in crude oil prices gasoline has advanced 3.67 cents a gallon from the average low point of early October, the present average price being 17.26. Since Jan. 1, 1925, crude has advanced from $1.10 to $1.80 a barrel, net of 70 cents.

The yield of gasoline per barrel of crude varies with refining methods and the grade of crude oil, but averages about 30 per cent. In other words, a 42-gal. barrel of crude yields about 13 gal. of gasoline on the average, and other products and refining losses account for the remainder.

In commenting on these facts the *Wall Street Journal* admonishes its readers to remember that refiners were selling gasoline throughout the summer of 1924 at prices that would hardly yield a fair return on the investment, and that in all fairness present prices should allow them to recoup such losses as they sustained.

Oil men themselves explain that the recent upward change in prices is merely a manifestation of a natural economic sequence.

ELECTRIC RAILWAY MATERIAL PRICES—FEB. 26, 1925

Metals—New York

Copper, electrolytic, cents per lb.	14.687
Lead, cents per lb.	9.175
Nickel, cents per lb.	31.00
Zinc, cents per lb.	7.87
Tin, Straits, cents per lb.	57.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.45
Somerset mine run, Boston	2.125
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	1.875
Central, Ill., screenings, Chicago	1.875
Kansas screenings, Kansas City	2.50

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$43.00
Standard open hearth rails, gross ton	43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.05
Tie plates (flat type), cents per lb.	2.425
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.10
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.60

Hardware—Pittsburgh

Wire nails, base per keg	2.85
Sheet iron (28 gage), cents per lb.	3.50
Sheet iron, galvanized (28 gage), cents per lb.	4.75
Galvanized barbed wire, cents per lb.	3.55
Galvanized wire, ordinary, cents per lb.	2.60

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.20
White lead (100 lb. keg), cents per lb.	0.1625
Turpentine (bbl. lots), per gal.	0.94
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	17.00
Rubber-covered wire, No. 14, per 1,000 ft.	$7.00
Weatherproof wire base, cents per lb.	19.50

Paving Materials

Paving stone, granite, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.82
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.25

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.75
Light copper, cents per lb.	10.00
Heavy brass, cents per lb.	7.50
Zinc, old scrap, cents per lb.	4.25
Lead, cents per lb. (heavy)	7.50
Steel car axles, Chicago, net ton	$19.25
Cast iron car wheels, Chicago, gross ton	19.25
Rails (short), Chicago, gross ton	20.25
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	12.25

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Extensive Improvements Planned in New Orleans

Improvements planned by the New Orleans Public Service, Inc., New Orleans, La., during 1925 will cost approximately $6,641,203. With the completion of the program planned for this year, the Public Service will have spent $21,022,253 in 3 years. Among other things the improvements will include new machinery for the power houses and substations, changes in overhead and underground systems of distribution and machinery to increase the capacity of the gas department to 21,250,009 cu.ft.

Changes in American Car & Foundry Personnel

H. W. Wolff, vice-president of the American Car & Foundry Company, and G. R. Scanland, formerly auditor, have been elected to the board of directors of the company. Mr. Scanland has also been elected vice-president in charge of finance and accounts. Others elected were S. A. Maleppe, assistant treasurer, in place of S. S. De Lano, deceased; E. S. Block, assistant auditor, and A. E. Jackson, assistant treasurer.

Rolling Stock

Madison Railways, Madison, Wis., expects to purchase from the Yellow Coach Manufacturing Company, Chicago, three buses of the street-car type seating 29 passengers.

Municipal Railway of San Francisco, San Francisco, Cal., will purchase 10 all steel cars at a cost of $16,000 each.

Minneapolis Street Railway, Minneapolis, Minn., expects to spend $500,000 for some 50 buses and $100,000 additional for a garage as soon as the bus ordinance is passed.

Track and Line

Grand Rapids Railway, Grand Rapids, Mich., expects to spend $746,714 on relaying and building new track, making a total of $2,081,737 spent for construction since 1919.

Denver Tramway, Denver, Col., plans to construct a new car line, a cross-town branch extending from Broadway to University Avenue and possibly beyond Colorado Boulevard when plans for reorganization and removal of receivership are completed. The line will be from 23 to 40 blocks long. This construction is part of the South Denver improvement program, providing for construction of a consolidated freight and passenger railroad station.

Key System Transit Company, Oakland, Cal., has been granted an extension of time by the Railroad Commission in which to construct double tracks across 41st Street and Piedmont Avenue in the city of Oakland, double tracks across Arroyo Avenue between York Drive and Ricardo Avenue at grade and a single track across Cambridge Way between York Drive and Ricardo Avenue at grade in the city of Piedmont.

Shops and Buildings

Public Service Railway, Newark, N. J., plans to erect a combination car-house and garage at New Brunswick, N. J., to be about 400 ft. long on Sanford and Delevan Streets and 200 ft. on Commercial Avenue. Six tracks would lead into the building. The garage would be 120 by 190 ft., with a 115-ft. pit. In addition there would be a bus repair shop, oil house and store room.

Wisconsin Power & Light Company, Fond du Lac, Wis., plans to build a modern interurban-bus terminal at Fond du Lac. Administrative and sales departments will also be located in this building. A train shed will be added to the building of sufficient size to provide ample space for the increasing number of buses in operation.

Trade Notes

Combustion Engineering Corporation, New York, N. Y., has announced the appointment of W. R. Quinn, former manager of the fuel oil department, as Pacific Coast agent, with headquarters in San Francisco. Mr. Quinn's territory will include the states of Washington, Oregon and California.

Economy Electric Devices Company, Chicago, Ill., announces the installation of 10 additional meters with inspection dials on the Denver Tramway's equipment. This installation completely equips all of the rolling stock on this property.

Allen D. Turner, formerly in charge of convention publicity for the Westinghouse Electric & Manufacturing Company, with headquarters at Pittsburgh, and more recently in charge of automotive equipment advertising at the Springfield, Mass., office, has been appointed publicity manager of the New England district office of the company with headquarters at 10 High Street, Boston.

Charles Piez, chairman of the board of the Link-Belt Company, Chicago, tells in the January number of *System* what he means by the "Exception Plan." "The man who has continually to work overtime is a poor executive," is the opinion of Mr. Piez. He says the executive cannot immerse himself in routine matters, but must hold himself free to take care of the exceptions. He is in effect an emergency man, and added that it would mean death to his usefulness if he made himself the slave of a time-table.

Okonite Company, Passaic, N. J., opened an office at 310 South Michigan Avenue, Chicago, on Feb. 1 and took over the sale of Okonite products in the Western territory. Charles E. Brown, formerly vice-president of the Central Electric Company, was appointed vice-president in charge of the territory west of Pittsburgh and east of the Rocky Mountains of the Okonite Company, with headquarters in Chicago. A. L. McNeill, formerly manager of the railroad department of the Central Electric Company, has been appointed manager of the railroad department. E. H. McNeill, formerly railroad sales representative of the Central Electric Company, has been appointed sales engineer. Ray N. Baker, formerly railroad sales representative of the Central Electric Company, has been appointed sales engineer. L. R. Mann, formerly sales representative of the Central Electric Company, with headquarters at St. Louis, has been appointed manager of the St. Louis office. Joseph O'Brien, formerly railroad sales representative of the Central Electric Company, has been appointed sales representative, with headquarters in Chicago. C. E. Brown, Jr., formerly country sales manager of the Central Electric Company, has been appointed manager of the light and power department.

Lynn W. Nones has been appointed Eastern sales manager for the Diamond Power Specialty Corporation, in charge of the Atlantic Coast offices from Boston to Charlotte inclusive. His office is at 90 West Street, New York.

New Advertising Literature

Texas Company, New York, N. Y., in the January issue of *Lubrication* has given much information regarding lubrication practice for electric railways. Articles on methods of reclaiming, handling and storing lubricants are given, together with specific recommendations to eliminate waste and increase efficiency.

Portland Cement Association, Chicao, Ill., has issued a publication entitled "Design and Control of Concrete Mixtures." This booklet describes a method to produce concrete of predetermined strength.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has reprinted the paper "The Development of the Electric Locomotive," originally presented before the meeting of the American Railway Association in Atlantic City in June, 1924. The paper points out the salient facts incident to electric locomotive progress.

General Electric Company, Schenectady, N. Y., has issued bulletin No. 47640.2, devoted to induction, time, over-current relays, types IA-201, IA-202 and IA-206. It describes the four forms of over-current relays, together with the applications of each. Details of construction, lists of available ratings and principles of operation are covered, together with other general information. The bulletin is illustrated by photographs, charts and diagrams.

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 21, on junction box condulets with removable hub plates.

Federal Porcelain Company, Carey, Ohio, has issued its condensed catalog of standard electrical porcelain in response to a demand from some of its jobber customers for a small catalog, but one that would at the same time contain complete information on all the types most in demand. The condensed catalog contains list prices, weights, barrel quantities, dimensions and wire carrying capacities on all the items of standard porcelain which are most commonly in demand. The folder is properly punched to fit standard E. S. J. A. salesmen's binders.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, March 7, 1925 *Number* 10

Municipal Ownership— or Public Ownership

CHICAGO is about to vote on a new transportation ordinance, as outlined elsewhere in this issue. The City Council has passed it by a vote of 40 to 5, which indicates at least a fair chance of approval by the voters at the coming referendum on April 7.

After 30 years of strife over local transportation the solution now offered is essentially an expedient. A previous attempt to give the city a unified comprehensive system to provide for future growth was defeated in 1918. The present proposal introduces several new features. It eliminates the necessity of granting a long-term franchise to permit financing, by issuing municipal certificates for this purpose. It avoids the use of general tax funds for the benefit of the car rider by insuring a flexible rate of fare that is automatically changed without action by the city council. Capital account will be amortized through the establishment of a sinking fund that must be paid out of the car fare. Freedom from political control is sought through vesting broad powers in a railway board representing the city and security holders. A universal city-wide fare with free transfers between surface, elevated and subway cars is established for the purpose of encouraging maximum use of rapid transit facilities for the longer rides.

Mayor Dever says the ordinance provides for municipal ownership. He was elected as an advocate of that program. But in an interview with a representative of ELECTRIC RAILWAY JOURNAL, he said: "That does not mean political control. Quite the contrary. It means taking traction out of politics; providing a plan which will enable a comprehensive system to be developed to meet the present and future needs of the city. The board of operation is designed with a view toward providing an incentive to efficient and economical operation at least equal to that given by regulated private management under a service-at-cost franchise."

Samuel Insull, speaking to stockholders of the Commonwealth Edison Company, said that he had not much faith in a scheme of shifting responsibility from individual management to municipal management. But, according to Mr. Insull, so urgent is the necessity that, speaking as a representative of the capital represented, he did not care what the scheme might be, provided it contemplated a co-ordination of the local transportation facilities in Chicago and a development of rapid transit in the largest sense of the word. He feels that the Mayor's plan is entitled to a friendly hearing and an impartial judgment.

Frank O. Wetmore, president of the First National Bank of Chicago, a representative of the bondholders of the surface car properties, said in a recent interview to the press that the municipal certificates which would be issued in exchange for existing securities and for raising new money would be sound securities. He added that the plan proposed is neither private ownership and operation nor municipal ownership and operation.

On its face the ordinance to be submitted to the voters of Chicago will be called municipal ownership. Title to the properties will be vested in the city. Actually, however, the lines will be owned by the holders of the "municipal railway certificate." Control will be vested in the board of nine members representing both the city and the security holders and designed to be free of political meddling. When 51 per cent of the outstanding certificates are retired, the city will acquire a controlling membership on the board. Then the danger of political plundering may become imminent. In that the present ordinance postpones this opportunity for the patronage dispenser 40 years lies one of its greatest virtues. Consequently, though it bears the label of "Municipal Ownership," which may cause the ever-present zealots who espouse that cause in other communities to point to Chicago as the largest new recruit, it has for the present at least taken only a step in that direction.

Transit Matters Move Fast in New York

DEVELOPMENTS in the New York transit situation since the presentation to the Governor of the McAvoy report early last month have been rapid. The Transit Commission has indorsed it in its entirety. The Interborough Rapid Transit Company has taken exception to one suggestion, that of lengthening the short local station platforms, not from a transportation standpoint but because it declares the cost of making this change to be beyond its credit capacity. It therefore urges a higher fare in a "memorial" to the Governor and legislature. In this memorial the company asks for itself only enough of the added fare "to enable it to render adequate service and make such additions and betterments as may be found necessary or advisable by the public authorities having jurisdiction in the matter." The Merchants' Association of New York through its committee on rapid transit has condemned the Mayor's plan of an isolated subway system instead of extensions unified and co-ordinated with the existing lines. Finally, the Governor, to whom the McAvoy report was addressed, has accepted and approved its findings. By a curious kind of logic, however, he uses the statements in the report of a deadlock between the Transit Commission and the city as an argument for complete home rule in New York on transit affairs.

The Governor therefore recommended the abolition of the commission and the transfer of its present powers to the city. He also urged an expansion of the present borrowing powers of the city by a constitutional change so that it may build and operate new subway lines. Incidentally, although the Governor does not say so, such

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additional credit, unless specifically limited to the construction of new subway lines, would enable the city to take over a considerable part of the existing lines under the "recapture" clauses of the dual contracts, thus providing for a city-wide municipally owned and operated transit system. In many respects the differences of opinion are not very great at present in the rapid transit policies of the Mayor and the Governor except as to whether the projected tunnel between Brooklyn and Staten Island will carry passengers and freight or only passengers. On this point the Governor explains that the nature of the proposed tunnel was specified by law and recommends this law be repealed.

Nothing Is Gained by Withholding Information

STREET railway service is subject to frequent interruptions from causes which are beyond the power of the management to control. No reasonable person will criticise the companies harshly for unavoidable delays of this kind. The attitude taken by the railway men toward the public after the delay has occurred, however, has an important influence on the way the latter feels about it.

That no effort will be spared to remove the cause of delays and to get the cars moving again as quickly as possible may be assumed. Meanwhile passengers are waiting impatiently in cars that remain motionless while other people are standing at terminals and street corners wondering why no cars come. "What is the matter? When will a car come?" Every one wants to know. Too often no effort is made to furnish information of this kind.

Nearly every line has some terminal point. Sometimes it is in an imposing terminal building and sometimes it is only an outdoor loop or switchback. But in any case there is likely to be a uniformed inspector or starter at hand. He usually has telephone communication with other points on the line and with the carhouse. The chances are that he knows the reason for any serious interruption to service and how soon the cars will be running again.

For some reason difficult to fathom, however, such men are often reluctant to give this information to the impatiently waiting people. Nothing is gained by this policy. In fact, a slight annoyance becomes a serious grievance when the passenger is so treated. The more progressive among the steam railroads long ago gave it up and adopted the plan of posting on a bulletin board the expected time of arrival of delayed trains and, where possible, the cause of delay. Why should not the street railway give all available information to its waiting patrons in case of interruption to service?

Besides being a satisfaction to the prospective passenger to know how soon he is likely to get a car, it would in many cases be a real convenience. If he knew that no car would come for 15 minutes he might be able to do an errand which he was planning to postpone to another day. Or again, if he were on his way to keep an appointment, this quarter of an hour might give him time to get in touch with his friend by telephone and explain the reason for his tardiness. Examples of how this policy would benefit the passenger might be multiplied indefinitely. In the long run any policy in matters of this kind that benefits the passenger benefits also the railway.

Adverse Weather Conditions and Bus Service

A FEW years ago many persons thought that the bus was only a fair weather means of transportation and that it could not render dependable service during the winter with snow and ice on the ground. In the light of greater experience, however, this opinion must be revised somewhat. Although the electric railway is inherently far better able than the bus to cope with a severe snowstorm, other factors have handicapped its actual effectiveness in operating under adverse weather conditions.

For example, the benefit of the better traction secured by steel wheels on steel rails as compared with rubber tires on a snow-covered asphalt pavement is entirely lost if some such rubber-tired vehicle as a 5-ton truck becomes stalled on the car tracks. Then again, as soon as the railway with its powerful plows and sweepers clears a path through the snowdrifts in the streets, all other vehicles hasten to take advantage of it and the speed of cars is reduced to a mere crawl, or perhaps they are halted altogether. Such conditions usually continue to hamper railway operation for days or weeks after a heavy snowfall. Theoretically this is unnecessary and unfair, but it is the actual situation in most cities and no altogether satisfactory remedy for it has yet been found. A similar condition exists with buses where the entire street area is not cleared and vehicles are required to travel in single file.

Where buses are used they encounter their most serious difficulties soon after the beginning of a storm. They slip and slide and often get stalled in deep snow. By the second or third day, however, some sort of a path has been made, and with the help of chains more or less dependable operation is possible. From that time on until the snow finally disappears there is little to choose between the bus and the trolley so far as regularity of service is concerned.

Dire predictions often heard, that the bus would be utterly useless as soon as the first snow fell, have not been fulfilled. Bus operation is hampered by unfavorable weather conditions, but in general it must be admitted that these vehicles have been able to open up their routes and render fairly acceptable service in spite of the elements.

Fuel Costs Go Up for the Principal Competitor

ELECTRIC railway officials and stockholders will regard with more equanimity than most persons the increases in the price of gasoline which have taken place during the last few weeks. While many railway companies operate buses and other automotive equipment, the disadvantage of a larger outlay for fuel for this equipment is more than counterbalanced by the fact that the principal competitor of the electric railway, the private automobile, is entirely dependent upon gasoline for its propulsion. It may be said that the cost of gasoline is one of the comparatively minor expenses in automobile operation, being usually exceeded by both tires and garage storage, and often by both depreciation and maintenance as well. Nevertheless an increase of 30 per cent or more in the cost of gasoline, such as has taken place within the last two months, is likely to make an impression on the average automobilist.

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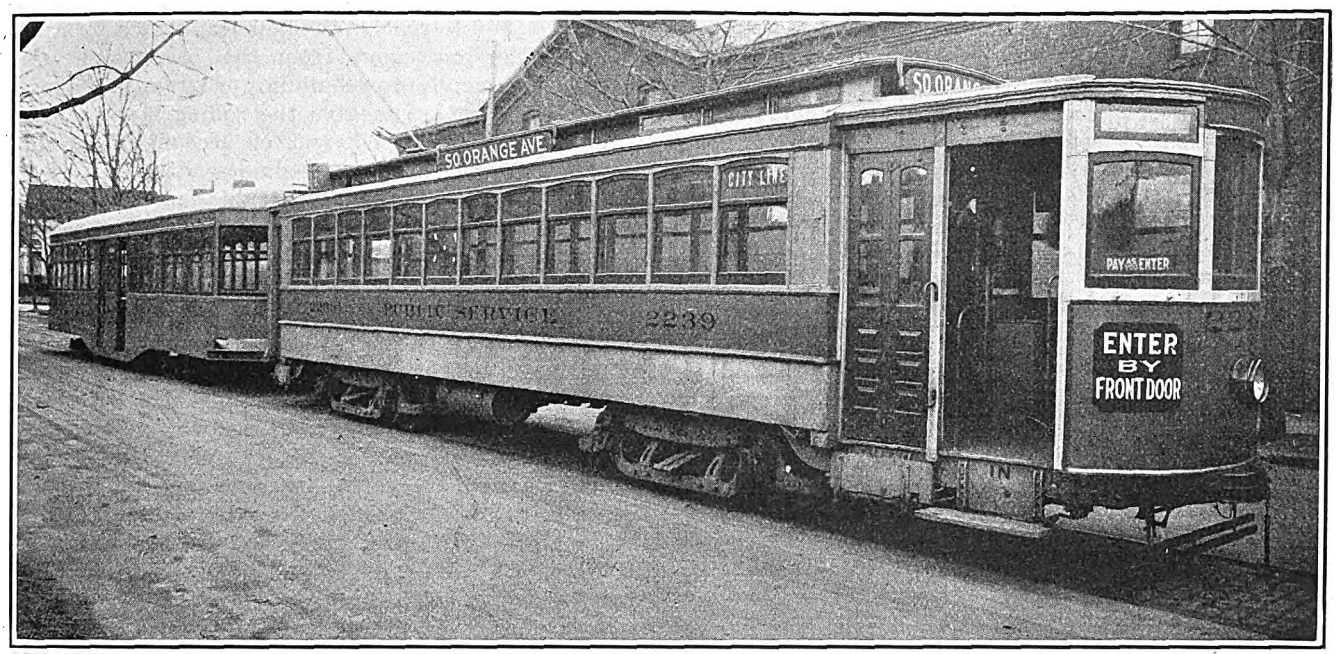

Two-Car Trains of This Type Are Used During Rush Hours with a Crew of Two Men. The Motor Car Is the Usual Front-Entrance-and-Exit Type, While the Trail Car Has Center Doors

Public Service Railway Has 92 per Cent One-Man Operation

This Company Now Operates More than 1,200 One-Man Cars on 70 Lines—Schedule Speed Has Been Slightly Increased and the Number of Boarding and Alighting Accidents Reduced Nearly 20 per Cent — Pneumatic Doors and Electric Fare Boxes Have Been Installed on Converted Cars—No Platform Employees Laid Off

IN FEBRUARY of this year the Public Service Railway of New Jersey was operating slightly more than 1,200 one-man cars on 70 lines. This constitutes about 92 per cent of the total service operated by the company. The present situation is the result of a steady growth of the one-man idea on this property during the past 2 years, particularly during the last 12 months. Outstanding results are an increase in the schedule speed, a reduction in the number of boarding and alighting accidents and important savings in operating expenses.

One-man operation on city lines was first undertaken by the Public Service Railway with the inauguration of safety car service in Paterson on Sept. 5, 1920. Prior to that time one or two shuttle lines in outlying districts had been operated in this way, but all the city and interurban cars were operated by two men. The Birney cars installed in the fall of 1920 were the first of 200 which the company had ordered a short time before. Eventually these were all put in service in various towns where the railway operates.

Double-truck one-man cars were first tried by this company on Nov. 28, 1921, on a crosstown line in Newark. These were standard 40-ft., double-end, side-seated cars, converted for one-man operation. Riding on this experimental line was fairly heavy, but it had the advantage of operating throughout almost its entire length over a route where no other cars ran. Following a successful trial on this route, one-man operation was gradually extended to other lines where the operating conditions were more or less similar.

In January, 1923, of the total number of cars operated by the Public Service Railway, 15.7 per cent were of the one-man type, either Birney or converted. During the first 7 months of the year this percentage was increased to 19.5. Then in August and September occurred a serious strike of platform men and all service was suspended for 59 days. When operation was resumed in October the one-man cars constituted 19.4 per cent of the total.

Soon after the resumption of service a 5-cent zone fare system was put into effect, as described in ELECTRIC RAILWAY JOURNAL for Oct. 6, 1923. A combination of circumstances, including an increase in wages granted to the men, a loss of traffic due to the strike and the fact that even under the previous 7½-cent fare the company had been losing money steadily, made it imperative that every possible operating economy be practiced. With this end in view it was decided to extend the use of one-man cars. How this has increased month by month is shown by the accompanying curve. Almost without exception each month has seen an increase in the number of one-man cars in operation, until at the end of January there were 1,199 such cars. Today the total is slightly more than 1,200. Two-man operation is still in effect, however, on a few of the interurban lines.

Heavy riding on certain city lines has not prevented the use of one-man cars. These are now operating on routes where the rush-hour headway is one minute or less. Two-car trains have been used to advantage on some lines during the past winter. They were particu-

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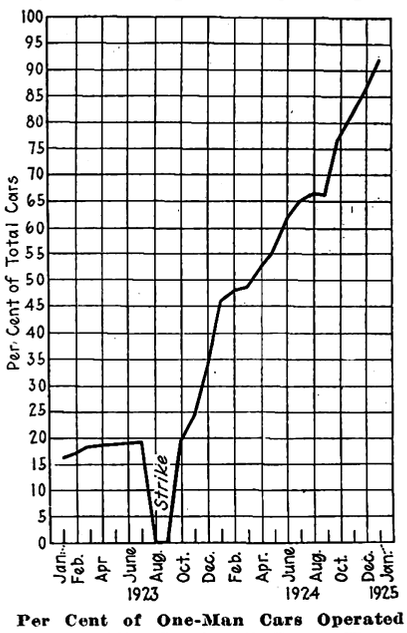
larly valuable in the emergencies caused by the severe snowstorms in January, when occasional irregularities in headway were unavoidable. A standard center-entrance trailer is permanently coupled behind a car of the ordinary front-entrance type. One man is stationed on each car. Signals are transmitted by a single-stroke electric bell system which has been installed in addition to the ordinary buzzers.

Changes Made in Converting Cars for One-Man Operation

After a careful study of the question of one-man operation, the company decided that it was of primary importance to have plenty of room on the platform of such a car, in order to separate boarding passengers from those alighting, and thus increase the speed of interchange. Conversion of double-end, longitudinal-seat cars, equipped with double folding doors on both sides of both platforms, was comparatively simple. Except where it was thought absolutely necessary to retain the double-end character of the car, they have been changed to single-end cars by permanently closing the doors on the blind side and removing the steps. On the near side one of the rear doors has been permanently closed, while the other has been equipped with a pneumatic door engine controlled from the front platform. Removal of control and other apparatus from the rear platform and the permanent closing of the doors have made it possible to install a number of additional seats on the back platform.



Per Cent of One-Man Cars Operated by Public Service Railway Has Increased Steadily During the Past Two Years

All one-man cars operated by the Public Service Railway are equipped with pneumatic door engines, this being thought essential to good service under these conditions. A motorman has three door-operating handles. One is for each of the front doors and the third to control the rear door. An emergency control for the use of passengers in case of accident has been arranged and placed in a glass-covered case on the back platform.

A more difficult problem arose concerning the conversion of single-end cars for one-man operation. Most of these cars had small front platforms and large rear platforms. In the case of those with longitudinal seats the ends of the car were reversed and double folding doors were installed on what previously had been the blind side of the rear platform. An emergency exit door was installed on what had been the blind side of the front platform, while the doors formerly used were boarded up.

This method of conversion, however, was not feasible in the case of cars equipped with cross seats. It was necessary in such cases to extend the front platform about 2½ ft. and to remove the bulkhead which formerly separated the motorman from the passengers. An unusual outcome of the rebuilding program is that the changes have tended to give the rolling stock a more uniform appearance. Whereas on account of the different platform lengths the single-end cars used to present a sharp contrast to the double-end cars, all cars now have nearly the same exterior appearance.

On the near side of the dasher of every one-man car a red sign has been painted to indicate that it is a front-entrance car. In the vestibule window immediately above this is displayed a smaller reversible sign to indicate whether the car is operating pay-as-you-enter or pay-as-you-leave. Red and blue colors are used respectively to distinguish the two fare collection methods. In general, single-fare lines are operated pay-enter inbound and pay-leave outbound. On two-fare lines cars are operated pay-enter in the first zone and pay-leave in the second, irrespective of the direction in which they are going. Where there are more than two zones identification checks are used. For example, on a three-fare line in all zones passengers pay on entering. In the first area no identification check is issued and no fare collected when the passenger alights. Those boarding in the second zone receive an identification check, and in the third zone a different kind of identification check. The fare collected when the passenger gets off depends on the color of the identification check which he has. The number of checks averages only about 870,000 per month, and this is not an important item of expense. More than 6,500,000 transfers were used per month when the 7½-cent fare was in force.

Fare Collection Speeded Up

On the converted cars of the Mount Prospect line, in Newark, electric fare boxes have been installed. This is a fairly heavy crosstown route serving residential districts at its two ends and passing through the center of the city. Checks were made before and after the installation of automatic fare boxes to determine their effect on the speed of operation. More than 1,200 observations showed an average time of 2.16 seconds per boarding passenger with the old style fare box and approximately the same number of observations gave an average of 1.92 seconds after the change. This indicated a time saving of about 12 per cent and the company is now considering the installation of automatic fare boxes on other lines.

Another means to reduce the time taken boarding and alighting is the use of street collectors. During rush hours they are stationed at fixed points in the congested districts, usually on safety aisles, and collect fares so that in the afternoon passengers may board cars by the rear door, or in the morning leave cars by the rear doors on pay-leave lines. Actual door operation is controlled by the motorman. By means of a single-stroke electric bell the collector signals him when to open and close the rear door. A push button for this signal is inconspicuously located alongside the door.

In the Public Service terminal building automatic turnstiles have been installed at the stairs leading down to the subway loading tracks and up to the elevated platforms. Passengers board cars on these upper and lower levels, using doors at both ends. Loading time is thus saved at small cost. The only attendants neces-

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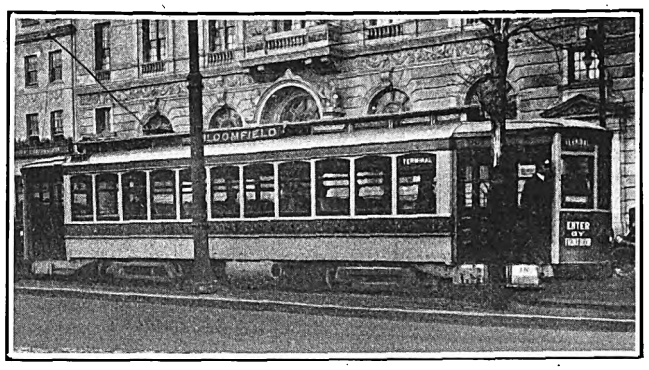
sary for the operation of the turnstiles are in the change-making booths in the center of the terminal concourse. As the fare is 5 cents and no transfers are issued, the use of automatic turnstiles is a practicable arrangement.

To train several hundred conductors to be motormen and vice versa was a big problem connected with the extension of one-man operation. This involved the instruction of a larger number of men in a shorter length of time than would ever have been the case under normal circumstances. The method followed was to send these men to the instruction school, where they took the regular courses, old motormen taking that for conductors and old conductors taking the motormen's course. They then returned to their own carhouses and were immediately put back on the cars. The force of traveling instructors was not sufficient to detail one to each of the new men, so it was arranged that they should break in at their new jobs in pairs. That is to say, an old motorman and an old conductor took out a car precisely as before except that they were both on the front platform and the motorman collected fares while the conductor operated the car. Either was therefore available to act as instructor to the other, being thoroughly familiar with that work. Moreover, if a car became slightly late or otherwise involved in difficulty, the trainmen could revert to their old jobs until the emergency had passed.

This plan of breaking in in pairs was followed for about 10 days. By the end of that time it was thought that a man should be able to do the work unassisted and he was sent out alone. In most cases this worked very well, but where a man had failed completely to master the new work an inspector or instructor was assigned to stay with him a while longer.

A few of the older men have appeared to be temperamentally unfitted to be one-man car operators. They have therefore been assigned to lines which continue to operate two-man cars or have been given other work. During the entire period of change from two-man to one-man operation no trainmen have been discharged on account of the reduction in number of men required to operate the cars. For this reason, and because a one-man operator is paid 5 cents an hour more than a man who works a two-man car, there has been practically no opposition on the part of the employees.



Single and Cross Seat Cars Have Been Converted for One-Man Operation by Extending the Front Platform and Installing Double Doors

In addition to the reduction in operating expenses which has been made possible by using fewer men on the cars, the company has made other savings on account of increased schedule speed and a reduction in the number of accidents of certain kinds. In December, 1921, after safety cars had been in service for slightly more than a year, their schedule speed was 7.82 m.p.h. and the entire system averaged 9.42 m.p.h. The schedule speed for the system has been increased 0.05 m.p.h., to an average of 9.47 m.p.h., at the present time.

The reason for the increase in the general average speed of the system is thought by the management to be that a one-man car is able to take advantage of traffic openings more quickly than is a two-man car. Where traffic signals are used a one-man car operator is able to start instantly if all his passengers are aboard, when the traffic signal allows him to proceed. The motorman on a two-man car, on the other hand, must wait until he receives a signal from the conductor, and thereby an appreciable amount of time is lost.

Statistics compiled by the claim department of the railway show that there has been no increase in the number of accidents due to the operation of cars by one man. On the contrary, in 1924 there were 585 fewer boarding and alighting accidents than in 1922. The year 1923 is not considered because of the long suspension of service. This is a decrease of 19.7 per cent and is attributed by the company to the fact that passengers get on and off under the eye of the motorman.

Time Is Saved Because the Operator of a One-Man Car Is Able to Take Instant Advantage of the Traffic Signal to Proceed

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Popularizing Street Car Service in Pittsburgh

Increased Traffic Has Resulted from Extension of Transfer Privileges and Sale of Sunday and Holiday Passes—Attractive Colored Posters Help to Sell the Service

LIKE many other traction companies, the Pittsburgh Railways were faced last year with the problem of traffic decreasing seriously on account of competition from the private automobile. The falling off on Sundays and holidays was particularly noticeable. At the time this matter was under consideration, the present 10-cent cash fare and 8⅓-cent token rate was in effect, and it was felt by the management that a large volume of non-necessity riding could hardly be secured at this rate.

As a means to encourage riding special Sunday transfer privileges were arranged as described in previous articles in this paper. Following the successful trial of this plan it was decided to experiment with a 25-cent pass good all day on Sunday and holidays on any line in the city fare zone.

The reasons which actuated the management to make this experiment were twofold. In the first place it is felt that novelties from time to time are desirable to stir up interest in a utility that has few technical changes to attract attention. In the second place, people who are induced to ride the trolley because of some special sales proposition are better prospects for travel at other times. From the very beginning the results of this experiment have been extremely satisfactory.

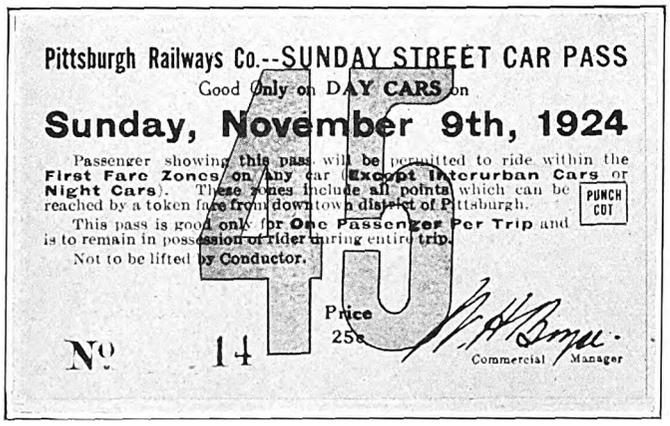
For the first Sunday, Oct. 26, 1924, the demand exceeded all expectations. Although 17,500 passes had been printed, many carhouses were sold out before noon. On the following Sunday 33,148 passes were sold. By Jan. 4, 1925, the use of Sunday passes had increased to 40,867. On the average the passes have produced about 21 per cent of the Sunday revenue. A calculation made by the management comparing like periods, a year apart, shows that in the 11 weeks preceding the installation of the pass Sunday revenue was about 10 per cent below what it had been the previous year, but in the 11 weeks following the sale of passes the revenue was less than 2 per cent below the corresponding period in 1923.

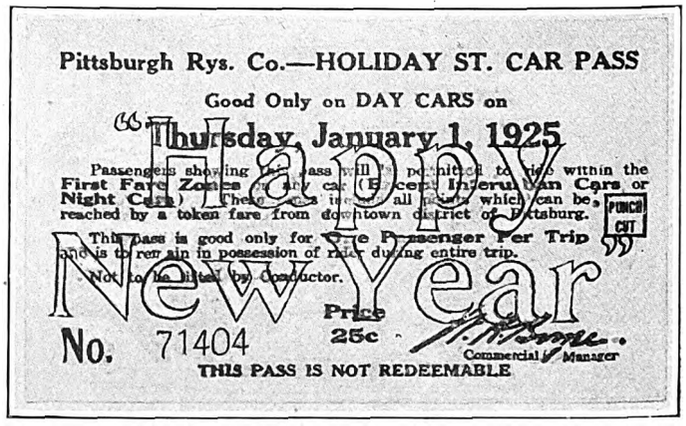
To secure an estimate of the use made of the pass, checks were made Nov. 9 and Nov. 23. These showed that approximately 6.8 rides were taken per pass during the day. While this figure is nearly double the usual Sunday riding on a pass in communities where the weekly pass is used, it is explained in part by the amount of transferring in Pittsburgh and in part by the number of short rides induced by the hilly nature of the territory.

In the table which appears on page 367 are shown the earnings by week before and after the sale of passes, together with the number of passes that were sold.

Following the Display of Attractive Posters of This Type Riding on Several Lines of the Pittsburgh Railways Showed a Marked Increase

During the first seven weeks of the Sunday pass the revenue averaged $40,697, as against $39,627 for seven pre-pass Sundays, or an increase of $1,070. Although on many Sundays in 1923 the revenue was higher than in 1924, the riding in the earlier year fluctuated more violently from week to week. It is thought that Sunday passes have tended to stabilize the revenue, because the man who buys a pass in the morning of a clear day will yield not less than 25 cents, no matter what the afternoon or evening weather may be.





Type of Sunday and Holiday Passes Used in Pittsburgh—The Number Indicates the Date

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WEEKLY EARNINGS BEFORE AND AFTER PASSES WERE SOLD

	Receipts	Passes		Receipts	Passes
Sept. 7	$38,063	.....	Dec. 7	$40,117	$38,052
Sept. 14	38,853	.....	Dec. 14	37,897	33,767
Sept. 21	37,581	.....	Dec. 21	38,118	33,936
Sept. 28	38,311	.....	Dec. 25	49,757	26,497
Oct. 5	41,441	.....	Dec. 28	40,566	34,518
Oct. 12	42,007	.....	Jan. 1	49,423	27,773
Oct. 19	41,113	.....	Jan. 4	42,658	40,862
Oct. 26	41,769	$15,179	Jan. 11	43,272	42,019
Nov. 2	42,787	33,148	Jan. 18	43,215	43,584
Nov. 9	41,144	36,312	Jan. 25	44,233	45,341
Nov. 16	39,741	37,780	Feb. 1	42,710	42,129
Nov. 23	40,091	38,900	Feb. 8	45,226	48,845
Nov. 27	45,719	29,984	Feb. 15	40,345	36,981
Nov. 30	39,229	34,880	Feb. 22	44,417	43,498

It has been possible to handle the Sunday pass traffic with practically no addition to service. Due to the large number of routes in Pittsburgh, service had already been reduced to the limit on many lines and there was still so much excess mileage operated on Sundays that the railway has been able to handle this increased traffic with the addition of practically no mileage.

Another move to popularize the street railway service made during the summer of 1924 by the commercial department of the Pittsburgh Railways was the use of elaborate colored posters. That these have been of real value is shown by the fact that on several Sundays after the display of posters urging people to "visit the Zoo," the Highland Park and Negley lines increased their traffic nearly 20 per cent over what it had been on the preceding Sundays. Similarly a bathing poster brought an increase of riding amounting to about 13 per cent of the Oakmont line.

Posters are 19 in. x 27 in., and are displayed on the front bulkhead inside the car. They are mounted in frames of three-ply wood fitted with triangular brass corners, under which they are inserted like pieces of blotting paper into a pad. The mountings were made in the railway shop at a cost of approximately $3 each.

Economical production of the posters is accomplished by using wood blocks costing about $55 each, instead of the more expensive metal blocks ordinarily used for such purposes. Five posters, each printed in three or four colors, issued in editions of 1,200 each, making a total of 6,000, cost only $978. All the posters are the work of the railway's own artists.

Among those which have been used up to date is one of a lioness, the *Megatherium Americanum*. Another was a Christmas shopping poster which was paid for by the Retail Merchants' Association. The Pittsburgh Iron and Steel Exposition was the subject of a third. In some cases the posters have been so arranged that by a slight change in the wording the same picture can be used again for other purposes.

Woman Is Assistant Instructor at Denver

RECENTLY the Denver Tramway has added a woman to the instruction room forces. This woman was given special training in various departments of the company to fit her for the position. First she was placed at one of the divisions as a clerk and there came in contact with the trainmen. After six months or so in this position she went into safety work and it was found that she had a faculty for arousing enthusiasm and interest, so much so that the division to which she was assigned won five safety contests out of eight.

Then she was placed in the general superintendent's office at the complaint desk. Although the Denver Tramway does not advertise the existence of a complaint department, there is one desk to which all complaints are referred. In this position she came in contact with the public and learned the common causes of complaint. After six months adjusting complaints she was transferred to the instruction room as assistant to the chief instructor. In this latter position she brings home to the trainmen the principal causes for complaints about service, particularly those with which women and children are concerned. She is able to give the trainmen the woman's point of view and in general has filled an important rôle in developing the desired attitude toward the public.

Statistics Showing the Extent of the Industry

In Addition to the Customary Figures, a Supplemental Table Gives a Division of Types of Cars Which Are in Use

A FEATURE of the statistical work undertaken by this paper for many years has been the publication annually of a table showing the miles of track and cars operated by the electric railway companies of the country. These statistics are obtained each year from the data received for the McGraw Electric Railway Directory. The table of this kind published in the issue of this paper for Jan. 5, 1924, was compiled from the August, 1923, copy of the Directory, but advantage has been taken this year of the early publication of the 1925 edition of this directory to use the information sent in for that edition. These reports have been supplemented as regards motor passenger cars by information received in reply to a questionnaire on types of cars owned, sent out by this paper in December, 1924. The two tables accompanying this article may then be considered to represent very nearly the condition of the industry during December, 1924.

Following the practice of previous years the mileage and cars of an interstate road have been placed in the state containing the greatest mileage of that company, and operated mileage only is included.

The figures presented include the mileage and cars used on electrified sections of steam railroads as well as in city and interurban roads. Cable railway cars, of which there are 156 left in this country, all in the Pacific States, were included under "passenger trail cars," and storage battery cars and gas electric cars, not more than 20 altogether, were put in the table under "motor cars." Straight gasoline motor cars, such as used on branch lines of steam railroads, when owned by an electric railway company are included in the table under "other cars."

On roads operating by both steam and electricity, the effort was made to include in the table only that equipment used in electric railway service. In consequence, the 2,405 trail, freight and express cars reported by the Fort Dodge, Des Moines & Southern Railroad and the 1,419 trail freight cars reported by the Northwestern Pacific Railroad are not included. For much the same reason the 319 coal cars reported by the East St. Louis & Suburban Railway and 495 coal cars reported by the St. Louis & Belleville Electric Railway have also been omitted, though the 3,129 trail freight cars of the Pacific Electric Railway and the

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TABLE I—NUMBER OF ELECTRIC RAILWAY COMPANIES, MILES OF TRACK AND NUMBER OF CARS OF VARIOUS TYPES OWNED BY ELECTRIC RAILWAY COMPANIES IN 1924

New England States	No. of Cos. Operating	Miles of Single Track	Passenger Motor Cars	Passenger Trail Cars	Electric Locomotives	Freight Motor	Freight Trailers	Service Cars	Other Cars	Total All Cars
Connecticut	9	1,569.45	1,600	135	110	61	12	260	1	2,179
Maine	14	527.10	385	10	5	57	63	110	23	653
Mass	27	2,647.41	5,046	248	11	101	12	890	85	6,393
New Hamp.	12	261.01	323	...	2	5	1	48	10	389
Rhode Isl.	4	399.36	1,178	26	3	31	33	168	....	1,439
Vermont	6	113.72	89	...	5	3	3	9	3	112
1924 total	72	5,518.05	8,621	419	136	258	124	1,485	122	11,165
1923 total	73	5,581.44	8,962	386	138	206	147	1,537	120	11,496
Eastern States										
Delaware	1	139.73	191	72	...	3	...	30	....	296
D. of Col.	6	388.42	930	88	6	23	4	117	....	1,168
Maryland	9	692.20	1,973	161	13	21	74	15	2	2,259
New Jersey	21	1,422.21	2,915	108	2	6	10	321	23	3,385
New York	86	5,407.29	17,098	1,672	129	78	101	1,713	535	21,326
Pennsylv'a.	101	4,627.66	7,809	429	6	175	121	1,069	135	9,744
Virginia	13	447.21	864	64	3	16	32	60	1	1,040
W. Virginia	15	612.04	400	9	15	20	31	39	12	526
1924 total	252	13,736.76	32,180	2,603	174	342	373	3,364	708	39,744
1923 total	261	13,797.86	32,074	3,092	179	359	385	3,362	758	40,209
Central States										
Illinois	41	3,555.45	6,180	860	61	337	1,084	709	5	9,236
Indiana	28	2,490.86	1,799	270	13	54	636	145	252	3,169
Iowa	23	960.94	707	103	37	21	381	149	30	1,428
Kentucky	7	491.84	807	62	...	15	10	143	8	1,045
Michigan	22	1,781.53	2,832	337	21	129	170	235	274	3,998
Minnesota	10	700.09	1,236	6	6	3	...	103	20	1,374
Missouri	19	1,138.10	2,578	268	5	20	27	337	22	3,257
Ohio	60	3,880.19	4,147	583	35	246	388	433	457	6,289
Wisconsin	18	788.40	1,176	66	8	14	29	310	19	1,622
1924 total	228	15,787.40	21,462	2,555	186	839	2,725	2,564	1,087	31,418
1923 total	255	16,006.39	21,176	2,540	198	749	3,466	2,567	1,068	31,764
Southern States										
Alabama	11	398.80	500	88	3	10	42	103	15	761
Arkansas	8	126.32	224	19	...	1	6	17	3	270
Florida	7	196.61	353	11	...	12	5	26	....	407
Georgia	10	488.67	714	32	1	6	10	14	47	824
Louisiana	8	315.35	827	47	...	6	...	81	2	963
Mississippi	7	94.08	109	20	...	5	1	3	2	140
N. Carolina	8	355.10	295	22	17	6	161	25	9	535
S. Carolina	4	126.18	126	9	...	1	...	6	12	154
Tennessee	9	423.22	668	80	1	4	2	65	5	825
1924 total	72	2,524.33	3,816	328	22	51	227	340	95	4,879
1923 total	76	2,551.66	3,739	391	24	43	272	297	105	4,871
Western States										
Arizona	3	43.79	48	...	...	...	...	3	...	51
California	33	3,388.41	4,255	297	92	170	3,574	660	47	9,095
Colorado	10	396.24	383	150	8	6	218	81	6	852
Idaho	2	88.70	32	...	3	...	21	3	....	59
Kansas	13	518.71	368	26	3	46	136	43	....	622
Montana	7	844.49	116	25	90	...	2	10	4	247
Nebraska	5	250.96	595	10	4	4	...	74	....	687
Nevada	1	7.50	5	...	...	...	...	...	....	5
New Mex.	2	10.95	16	...	...	...	...	...	....	16
N. Dakota	4	25.79	35	22	...	...	...	9	....	57
Oklahoma	13	338.28	284	16	8	6	202	22	34	572
Oregon	8	760.92	698	76	19	2	506	197	31	1,529
S. Dakota	2	19.75	27	...	...	2	2	3	...	34
Texas	22	1,020.54	1,416	95	1	20	13	136	86	1,767
Utah	5	511.58	258	54	21	10	240	13	211	807
Washington	14	1,027.11	1,055	92	32	34	653	85	56	2,007
Wyoming	1	16.50	8	...	...	...	...	....	4	12
1924 total	145	9,270.22	9,599	863	281	300	5,567	1,339	479	18,428
1923 total	155	9,345.92	9,298	1,014	275	355	4,172	1,208	384	16,706
1924 total U. S.	769	46,836.76	75,678	6,768	799	1,790	9,016	9,092	2,491	105,634
1923 total U. S.	821	47,283.28	75,249	7,423	814	1,712	8,442	8,971	2,435	105,046

TABLE II—MOTOR PASSENGER CARS OWNED BY THE ELECTRIC RAILWAYS IN THE UNITED STATES DURING 1924 DIVIDED BETWEEN CITY AND INTERURBAN SERVICE AND CLASSIFIED AS TO TYPE

New England States	City Service: One-Man	City Service: One-Man Two-Man	City Service: Two-Man	City Service: Total City	Interurban Service: One-Man	Interurban Service: One-Man Two-Man	Interurban Service: Two-Man	Interurban Service: Total Interurban	Total Motor Cars
Connecticut	187	53	1,173	1,413	3	17	167	187	1,600
Maine	110	62	52	224	33	29	99	161	385
Mass	874	889	2,907	4,670	53	3	320	376	5,046
New Hamp.	40	63	92	195	20	12	96	128	323
Rhode Island	25	235	817	1,077	15	...	86	101	1,178
Vermont	2	.....	50	52	14	...	23	37	89
Total	1,238	1,302	5,091	7,631	138	61	791	990	8,621
Eastern States									
Delaware	.....	.....	60	60	.....	...	131	131	191
D. of Col.	73	2	833	908	.....	...	22	22	930
Maryland	132	.....	1,712	1,844	4	...	125	129	1,973
New Jersey	142	49	183	374	396	31	2,114	2,541	2,915
New York	1,858	660	12,438	14,956	106	45	1,991	2,142	17,098
Pennsylvania	603	524	5,010	6,137	97	28	1,547	1,672	7,809
Virginia	270	12	496	778	2	...	84	86	864
W. Virginia	80	22	143	245	20	...	135	155	400
Total	3,158	1,269	20,875	25,302	625	104	6,149	6,878	32,180
Central States									
Illinois	360	157	4,800	5,317	206	1	656	863	6,180
Indiana	560	37	746	1,343	11	5	440	456	1,799
Iowa	253	78	286	617	19	6	65	90	707
Kentucky	179	.....	499	678	47	...	82	129	807
Michigan	562	104	1,308	1,974	128	27	703	858	2,832
Minnesota	42	.....	1,167	1,209	.....	...	27	27	1,236
Missouri	246	183	1,997	2,426	1	1	150	152	2,578
Ohio	508	134	2,250	2,892	86	15	1,154	1,255	4,147
Wisconsin	515	152	382	1,049	18	11	98	127	1,176
Total	3,225	845	13,435	17,505	516	66	3,375	3,957	21,462
Southern States									
Alabama	116	2	293	411	29	...	60	89	500
Arkansas	84	92	.....	176	18	...	30	48	224
Florida	218	9	102	329	20	...	4	24	353
Georgia	47	34	449	530	25	...	159	184	714
Louisiana	51	4	765	820	.....	...	7	7	827
Mississippi	67	.....	2	69	.....	...	40	40	109
N. Carolina	64	.....	131	195	.....	...	100	100	295
S. Carolina	43	.....	83	126	.....	...	.....	.....	126
Tennessee	66	.....	570	636	.....	...	32	32	668
Total	756	141	2,395	3,292	92	...	432	524	3,816
Western States									
Arizona	6	...	33	39	.....	...	9	9	48
California	333	204	2,819	3,356	53	20	826	899	4,255
Colorado	240	.....	68	308	8	...	67	75	383
Idaho	10	7	.....	17	.....	...	15	15	32
Kansas	122	3	36	161	36	...	171	207	368
Montana	59	5	45	109	1	...	6	7	116
Nebraska	23	3	460	486	54	...	55	109	595
Nevada	.....	.....	.....	.....	5	...	.....	5	5
New Mexico	.....	.....	.....	.....	9	...	7	16	16
North Dakota	23	.....	8	31	.....	...	4	4	35
Oklahoma	164	8	39	211	11	7	55	73	284
Oregon	6	.....	2	8	77	5	608	690	698
S. Dakota	8	.....	16	24	.....	...	3	3	27
Texas	697	36	549	1,282	13	...	121	134	1,416
Utah	117	36	54	207	.....	...	51	51	258
Washington	518	116	323	957	15	1	82	98	1,055
Wyoming	.....	.....	.....	.....	5	...	3	8	8
Total	2,326	418	4,452	7,196	287	33	2,083	2,403	9,599
Total for U.S.	10,703	3,975	46,248	60,926	1,658	264	12,830	14,752	75,678

992 trail freight cars of the Illinois Traction Company are included. The 3,129 trail freight cars of the Pacific Electric Railway mentioned above are 1,272 in excess of those reported last year. If it was not for this increase the total number of cars for 1924 would be less than last year.

Estimates had to be made in some cases, where lessor and lessee companies were concerned, in regard to track and to some extent to rolling stock, so as to avoid duplication, where the figures as reported for the Directory or the questionnaire were not very clear in this regard. In some cases, also, the returns for the Directory and questionnaire did not agree. For these reasons the figures in the two tables can be considered approximate only, but they are believed to be as close to the facts as can be reasonably obtained under private direction, as distinguished from figures compiled by the Census Department.

A noticeable feature of Table I is the reduction in the number of companies. This occurs in each group of states and is due primarily to consolidation.

Reports to the questionnaire, upon which the second table is based, were received from about 80 per cent of the companies, representing more than 90 per cent of the cars. In this table the great growth in the number of one-man two-man cars recently is most notable. This type of car was hardly known two years ago. There are now more than 4,000 of them. The two-man car classification includes all cars used in city rapid transit service, though in some cases trains made up with this kind of car are being operated with fewer than one man per car. They were put in the two-man classification because if run singly these cars would require two men.

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Chicago Plans $720,902,000 Unified Transportation System

Purchase Ordinance Under Which City Hopes to Take Over All Existing Transportation Facilities Passed by City Council — Service to Be at Cost with Universal Transfers—Control to Be Vested in Board of Nine Members

SHOULD an ordinance which has just been passed by the City Council of Chicago by a vote of 40 to 5 be approved at a referendum on April 7 all of the local transportation facilities may be taken over by the city. This is the result of agreements recently reached between Mayor Dever, bankers representing the bondholders of the surface street railways and Samuel Insull, representing the elevated lines. If upheld by the courts this will mean the adoption of a complete and co-ordinated plan for unification of all existing transportation facilities in Chicago, together with new construction and extensions amounting to approximately 465 single-track miles of surface and elevated railway, together with 68 miles of subway lines. The general physical plan contemplated is shown in the accompanying maps made up by Major R. F. Kelker, Jr., consulting engineer for the committee on local transportation of the City Council.

The entire program involves the ultimate expenditure of approximately $720,902,000. Of this amount, $162,843,584 represents the purchase price to be paid for the existing Chicago Surface Lines. The Chicago Rapid Transit Company will be purchased for $85,000,000, and $247,500 will be paid for that portion of the Chicago & Joliet Electric Railway within the city limits. Immediate surface line extensions, with equipment, including 500 passenger cars and necessary additions to shops and carhouses, will be made at an estimated cost of $25,432,000. This work is to be completed within 5 years. An immediate start is contemplated for the subways, including necessary equipment with 240 passenger cars. These are estimated to cost $62,162,000. Surface line extensions to be built in the second 5-year period, together with 100 additional cars, will cost $12,210,000 more. Extensions of rapid transit facilities and other miscellaneous items are provided for, which will bring the cost of the entire system to the approximate total of $720,902,000, as shown in the accompanying tabulation.

All this will be done under a plan which represents a new type of transportation agreement. The city will acquire and take title to all its existing local transportation facilities and to all extensions of the system. This will be financed through issue by the city of what are termed "Municipal Railway Certificates." These are not general city bonds, but are secured as to principal and interest solely by the property and earnings of the system taken over, together with such extensions as may be constructed under the ordinance. To make the certificates marketable under this limitation, the ordinance provides that a rate of fare must always be maintained which will yield sufficient income to pay the interest on the certificates and provide a sinking fund to retire them as they mature at the end of periods of

SCHEDULES OF EXPENDITURES FOR PURCHASE AND EXTENSION OF CHICAGO TRANSPORTATION FACILITIES

Purchase of Present Properties

Chicago City Railway Calumet & South Chicago Railway Southern Street Railway	$63,163,876	
Chicago Railways	84,963,201	
Cash in depreciation and renewal funds of Chicago City Railway, Calumet & South Chicago Railway and Southern Street Railway	5,838,939	
Cash in depreciation and renewal fund, Chicago Railways	8 877,568	
		$162,843,584
All existing elevated railway properties		85,000,000
Purchase of portion of Chicago & Joliet Electric Railway within city limits		247,500
		$248,091,084

Surface Lines—Immediate Extensions

Extensions to south side surface lines and 300 additional passenger cars together with additions to shop and carhouses, first 5 years	$14,641,000	
Extensions to north and west side surface lines and 200 additional cars with shop and carhouse facilities, first 5 years	10,791,000	
		$25,432,000

Subway Construction—Immediate

Construction of State Street, Madison and Po'k-Clark-Chicago Avenue subway—immediate construction	$47,554,000	
Equipment, including track, signals, etc., together with 240 subway passenger cars, necessary service equipment, shop facilities, etc	14,608,000	
		$62,162,000

Surface Line Construction—Second 5 Years

Extensions to south side surface lines and 50 additional cars with shop and carhouse facilities, second 5 years	$5,995,000	
Extensions to north and west side surface lines and 50 additional cars with shop and carhouse facilities, second 5 years	6,215,000	
		$12,210,000

Subway Construction—Second Period

Cottage Grove-Broadway subway and Madison subway, second period	$104,742,000	
Equipment of subway, track, signals, etc., together with 330 subway passenger cars, shop facilities, etc.	21,087,000	
		$125,829,000

Rapid Transit Construction—First and Second Period

New rapid transit extensions to be completed in first 10 years, including 2,760 new cars and necessary additions to shops, etc	$174,427,000	
New rapid transit extensions, second construction, including 780 new cars, etc	56,232,000	
		$230,659,000

Miscellaneous

Power houses, auxiliary buildings, etc	$49,500,000	
Cash to be paid into emergency fund	5,500,000	
Cash to constitute additions to depreciation and renewal fund for elevated railways acquired	8,000,000	
		$63,000,000

Summary

Purchase of existing properties	$248,091,084
Surface line construction, first 5 years	25,432,000
Immediate subway construction	62,162,000
Surface line construction, second 5 years	12,210,000
Subway construction, second period	125,829,000
Rapid transit construction, first and second periods	230,659,000
Miscellaneous	63,000,000
	$767,383,084

NOTE: All figures except purchase of existing properties include 10 per cent maximum allowance for sale of securities.

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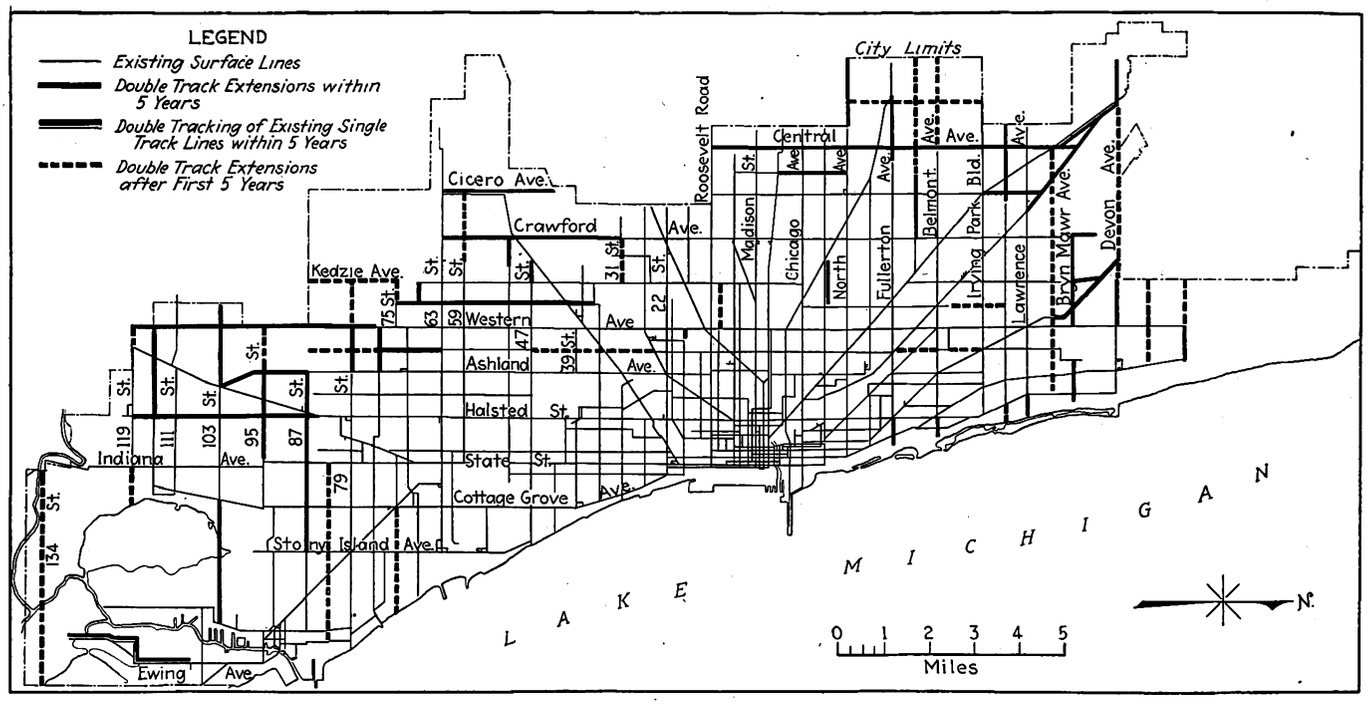


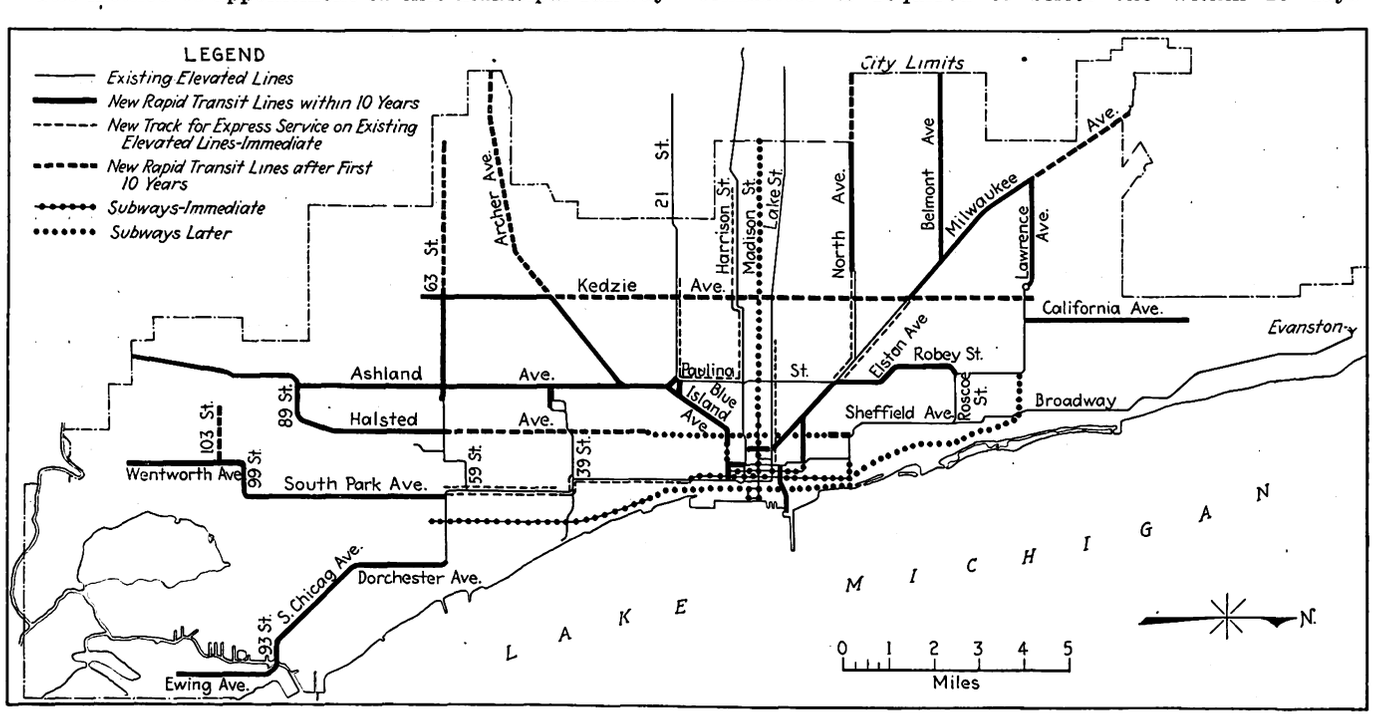
Map Showing Existing Surface Lines System and Extensions to Be Made Within 10-Year Period

30, 35 and 40 years. The certificates will bear interest at the rate of 5 per cent.

Although title to the properties is taken by the city, the control and operation is to be vested in a board of nine members. Three of these board members, designated as Group A, are to be selected by the Mayor with the approval of the City Council; three, designated as Group B, by a committee representing the holders of the certificates, and three, designated as Group C, by agreement between the Mayor and the committee. This is designed to insure a competent neutral board upon which the city and the security holders will have equal representation. Whenever the city shall have retired 51 per cent of the certificates issued under the ordinance, the composition of the board will be changed to include four representatives of the city and three members representing the security holders.

The method of appointment of this municipal railway board and the duration of the terms of its members, together with provisions for filling vacancies caused by resignation or death, are covered in detail in the ordinance. The Group C members must be selected from men of recognized high character and standing and experience. The three groups of the first board are to be divided so that one member of each group holds office for 3 years, one for 6 years, and one for 9 years. Their respective successors are to be chosen for terms of 9 years.

At the end of every 3 years the Mayor is to fill a vacancy in Group A and the certificate holders a vacancy in Group B. The two by agreement are to fill the vacancy in Group C. In the event of failure of the Mayor and the committee to agree on a member for Group C within 30 days, the Mayor is to tender to the committee the names of three persons, from which the committee is required to select one within 15 days



The Physical Plans Include the Construction of Elevated Extensions and 68 Single-Track Miles of Subways

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after the list of names is submitted. If the list does not include persons with the qualifications set forth in the ordinance, the committee may request the Mayor to submit additional names to meet the qualifications. Failure on the part of the Mayor to submit names which in the opinion of the committee include persons qualified to act as board members under the terms of the ordinance gives the committee the right to apply to the three sitting judges of the first division of the Appellate Court for the First District of Illinois for a decision as to the qualifications of the men whose names are submitted.

The members of the board cannot be removed or dismissed by the Mayor, but are subject to removal for palpable omission of duty, misconduct or malfeasance in the discharge of their duties. Members will receive a salary of $10,000 per year, changeable by agreement between the board itself, the certificate holders' committee and the City Council.

The certificate holders' committee is to consist of five members selected by the First National Bank of Chicago, the Illinois Merchants Trust Company and the Harris Trust and Savings Bank.

Executives, managers, engineers and other employees to operate the properties are to be appointed or employed by the municipal railway board. Salaries to be paid are to be commensurate with salaries usually paid for like services in enterprises of similar magnitude. The board must furnish the City Council with monthly statements of its operations and with such additional information as may be required from time to time.

Flexible Rate of Fare Specified

A flexible rate of fare to provide service at cost is specified in the ordinance. This is secured through the operation of a $5,000,000 emergency fund that is set up to act as a barometer of fares. Should the revenues of the properties be more than enough to pay the cost of operation and maintenance and interest and sinking fund requirements the fare would be reduced 1 cent when the fund reached $7,000,000 for a continuous period of 30 days. Should the fund drop to $3,000,000 or less for a period of 30 days, the fare would be increased 1 cent.

This flexible fare provision of the ordinance does not become operative until after the first year. For that period the fare is fixed at 7 cents for all surface, elevated and subway lines to be acquired or built. It is proposed to issue universal transfers between elevated, subway and surface lines, so that a single fare will be payment for a continuous ride in the same general direction between any two parts of the city, using such combination of the various forms of transportation facilities as may be necessary to effect this journey by the most direct and speediest route.

In the event that the city constructs subways or other local transportation properties, or buys buses with money not derived from the sale of municipal railway certificates, compensation is to be paid into the city treasury for the use of these properties by the municipal railway board. For the use of subways so constructed this amount is fixed in the ordinance at 0.80 per cent. The amount to be paid for the use of any other properties than subways is to be fixed by agreement between the Mayor and the board. This arrangement is designed to allow the city, if it desires, to use its existing traction fund (amounting to approximately $40,000,000) for the construction of transportation facilities, or to build such facilities by special assessment against the benefited property, instead of by the issue of certificates.

The city mortgages all the property which it acquires with municipal railway certificates to a responsible trust company to secure the payment of the interest and principal of these certificates. This mortgage, together with the provision for adequate rate of fare to pay all charges, is the only security given by the city to insure such payments. Failure to pay principal or interest allows foreclosure, but no franchise to operate is granted in the event that this happens.

All accounts of the transportation system are to be kept distinct from other city accounts. These are to be prepared as nearly as possible in accordance with the standard classification of accounts adopted by the American Electric Railway Association. Sinking funds are to be established for the several series of certificates to be issued. The annual charges to this fund are to vary in accordance with the term for which the various certificates are issued; 0.80 per cent per year for certificates maturing in 40 years, 1.09 per cent for certificates maturing in 35 years, and 1.48 per cent for those maturing in 30 years.

In addition to meeting all sinking fund and interest requirements, the rate of fare must be sufficient to maintain the property in a high state of repair and efficiency, and in addition must permit a sum equal to 8 per cent of the gross receipts monthly to be set aside in a separate fund for depreciation and renewals. The municipal railway board is required to pave the streets between its right-of-way and to maintain this paving in accordance with specifications included in the ordinance.

Gasoline Raise a Trolley Sales Argument

THE Department of Street Railways, Detroit, is using the recent increase in the price of gasoline as a sales argument for travel by trolley. The accompanying illustration shows the car card carried in the center of the car and reading as follows:

In Detroit the Increase in Gasoline Price Is Used as a Sales Argument for Travel by Trolley

Gasoline soars 44 per cent. Since Jan. 1, gasoline has jumped from 15.8 to 20.8 cents per gallon. In addition, a tax of 2 cents per gallon is effective. This is a 7-cent increase. Save by trolley. Board of Street Railway Commissioners.

In addition to this card inside the car, a number of the cars carry dash signs calling attention to the fact

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that the price of gasoline has gone up 44 per cent and the way to save money in local travel is to use the trolley.

New York Merchants Urge Co-ordinate Transit

Special Committee Report Condemns City's Transit Proposals as Uneconomical and Ineffective—Buses Useful Principally as Auxiliaries to Surface Lines

TWO important reports of the committee on city transit of the Merchants' Association of New York were made public this week. The Merchants' Association is the leading commercial organization of the kind in the city and has a membership of leading merchants numbering more than 7,000. Its committee on city transit has spent several months in studying the complicated transportation situation in New York as regards rapid transit and motor bus franchises in an endeavor to reach a businesslike conclusion. The two reports just presented to the board of directors of the association are the result. The committee consists of Theodore Beran, chairman; Jules R. Breuchaud, William C. Demorest, Ernest P. Goodrich, Edmond Earl Lincoln, Harry P. Nichols, Walter Stabler.

Rapid Transit Report Recommends 30 Miles of Immediate Construction

Taking up first the route of the proposed municipal Eighth Avenue-Washington Heights line, the committee in its rapid transit report recommends the connection of this line at points with the B.-M.T. system to utilize to the greatest extent all capital available for subway construction. Other lines recommended for immediate construction are a Brooklyn crosstown line and the completion of the Nassau Street line and the 14th Street-Eastern line. The total comprises 30.65 route-miles, aggregating considerably lower first cost and mileage than the route projected by the Board of Transportation.

In its discussion of the general transit policy which should be pursued by the city, the following are emphasized: A policy of unified operation to produce a maximum of service at a minimum of cost, by the most effective utilization of old and new facilities and the avoidance of construction costs of unnecessary new lines, the lowest possible rate of fare consistent with satisfactory service. The report declares in favor of the lines being self-supporting, however, and points out that this is not now the case as part of the cost is defrayed by taxes.

Motor Buses Cannot Fill the Need for Rapid Transit Subways

In its motor-bus report the committee says that all important rapid transit and surface street railway systems in the city have filed petitions or proposals providing for bus service in their respective territories. In addition, there are similar petitions from new corporations, making more than 50 filed with the Board of Transportation. Some of the routes proposed are overlapping or distinctly competitive with existing facilities.

The committee says that all thought that these additional bus lines can be so operated as to relieve the present rapid transit lines of any substantial part of their long-haul traffic may be dismissed. Hence, they cannot fill the constantly increasing need for additional subway facilities.

Investigations of the surface railway situation showed that the facilities of the present lines are not being used to capacity, yet a large proportion of the population is and must long continue to be dependent upon them for transportation. A division of traffic between existing car lines and one or more competing bus lines would normally so impair the earning power of all as to make it necessary ultimately to reduce service or to charge higher fares in order to pay expenses. If higher fares are not permitted, service will necessarily deteriorate. Since the fares charged by local transportation companies are closely regulated by law, it is contrary to the public interest to encourage unnecessary competition, which inevitably leads to duplication of investment, on which a return must be earned.

From all points of view, it seems desirable that whenever new bus routes are established, it should ordinarily be done by the existing transportation companies rather than by untried or competitive companies. Although the investment required for bus facilities of equal service is ordinarily much lower than that for surface cars, the operating cost of motor buses under reasonably comparable conditions and their rate of depreciation are generally much higher. The addition of buses to the present street car traffic would increase the congestion to such a point that traffic would be slowed down, with a resultant economic loss which would be hard to measure.

The use of the motor bus, while under certain circumstances clearly advantageous, is still in a distinctly experimental stage on the basis of a low rate of fare, so far as the United States is concerned. The conclusions of the committee as to policy follow:

Conclusions as to Policy

1. It is of doubtful legality for the city itself to engage in bus operation, nor in view of transportation facilities now existing and operating under franchise is it legal to authorize independent omnibus companies or individuals to compete with present transportation agencies unless a clear necessity therefor is established. Even if there were no legal difficulties, such a policy would be inequitable and economically unsound.
2. None of the proposed routes, either individually or collectively, can have much if any effect in reducing subway congestion.
3. Many of the recent proposals are unworthy of consideration, either because of the lack of experience of the petitioning companies, or because there is no economic justification for the additional investment.
4. Existing surface and subway lines should be encouraged and required to rehabilitate so far as necessary and to make the utmost use of their present equipment. They should also be granted the right to supplement or extend their present facilities through the development of bus routes when it is found that such service will be less expensive than a further development or continuance of the present means of transportation.
5. All important existing transportation companies have applied for motor bus franchises or have expressed their willingness to do so. Until more extensive experience has been gained in the operation of buses by these companies, either as an auxiliary service, an extension of present service, or as a substitute for trolley service when existing equipment becomes inadequate, it seems distinctly unwise for the municipal government to commit itself to any independent comprehensive plan of bus operation as a possible solution of our transportation difficulties.

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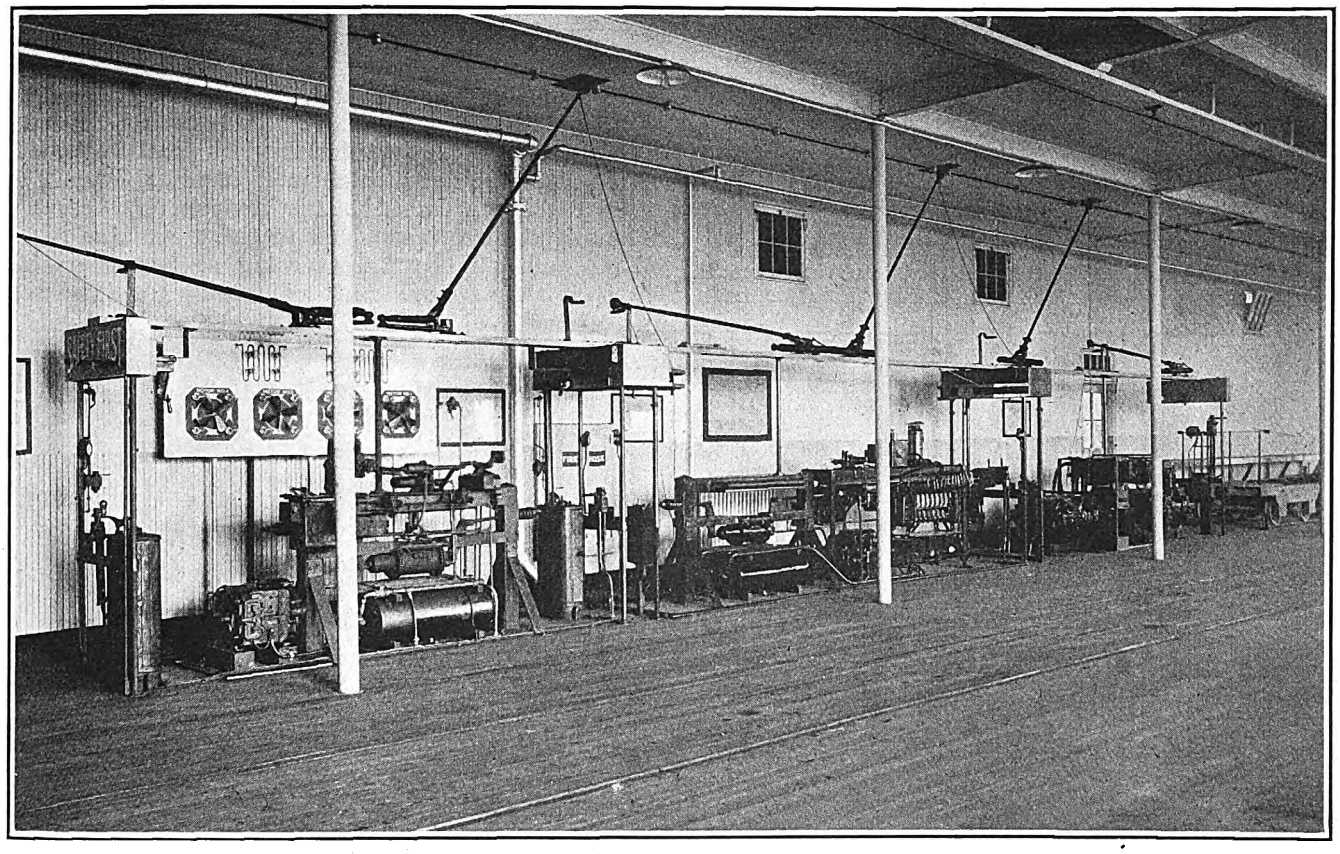
Boston "L" Has New Training School

Surface Car Operators and Rapid Transit Trainmen Are Taught Their Duties in a Completely Equipped Modern School — All of the Many Types of Equipment Used on This Railway Have Been Installed for Instruction Purposes



One Entire Side of the New Sullivan Square School Is Occupied by Surface Car Equipment. Note the Standard Track in the Center of the Room

INCREASING traffic in recent years has imposed different conditions upon surface car operators, and the necessity of familiarity with various types of cars has added other complications to the training of men for such service. The training of men for rapid transit service has become more technical on account of changes and improvements in car equipment. To meet these conditions the Boston Elevated Railway has moved its instruction school to new quarters at the Sullivan Square terminal. Under the direction of Frank S. Morgan, supervisor of instruction, new equipment has been installed and plans perfected for training men for the transportation division.

Previous to the year 1912, the system of instruction required only that each applicant undergo a course in platform training. He was given individual instruction in car operation, after which he was examined orally by the chief inspector. Then he was required to take a second examination given by the employment department, and if both examinations proved satisfactory he was certified and assigned to duty.

A separate instruction department was established in 1912, with a supervisor in charge. On the staff were also two assistant instructors detailed for class and shop training and four traveling instructors. The equipment of the school comprised types of control then in use, with motors and demonstration boards to show the applicant the flow of current under different conditions. A car arranged on a special track served to familiarize each applicant with actual operation. This predecessor school occupied about 3,000 sq.ft. of floor space.

The new school occupies about 6,500 sq.ft. of floor space, divided into rooms in which are installed every type of equipment that is in operation on cars of the Boston Elevated Railway. In addition there is provided a track connecting with a yard near by, on which a standard rapid transit train or a surface car can be run into the instruction room. There are two classrooms or examination rooms where men are gathered for examinations and instruction talks; a classroom for conductors where there are fare boxes, desks, and "clockboards"; a reception room and general office, and a private office for the supervisor.

The staff includes the supervisor, two assistants and twelve instructors. One of the latter is assigned to the rapid transit lines, and the remainder to the surface lines. Of these, five are traveling instructors, four are coasting instructors, and three are bus instructors.

An entire control and brake system for each standard type of car operated by the company has been set up exactly as on a car. Every pipe in the brake system,

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every valve, and every working part of prime importance has been labeled so that no student will have difficulty in ascertaining the position, name, and function of any part of the equipment. Each control operates a set of railway motors, or, through a system of relays and resistances, a set of fan motors.

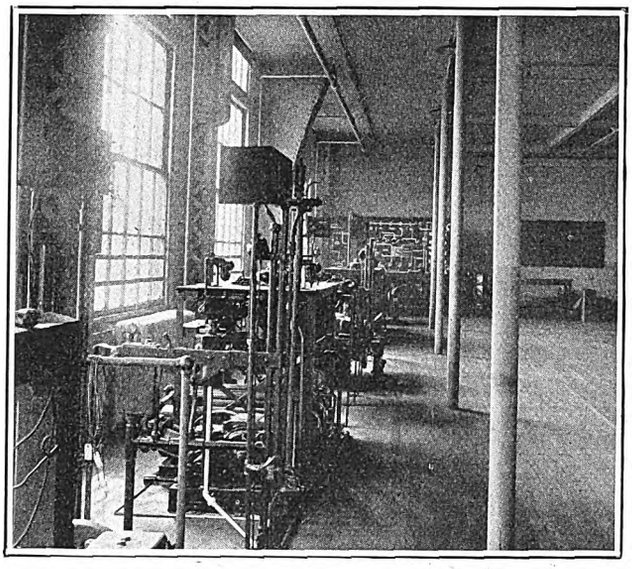
The equipment for demonstration includes:

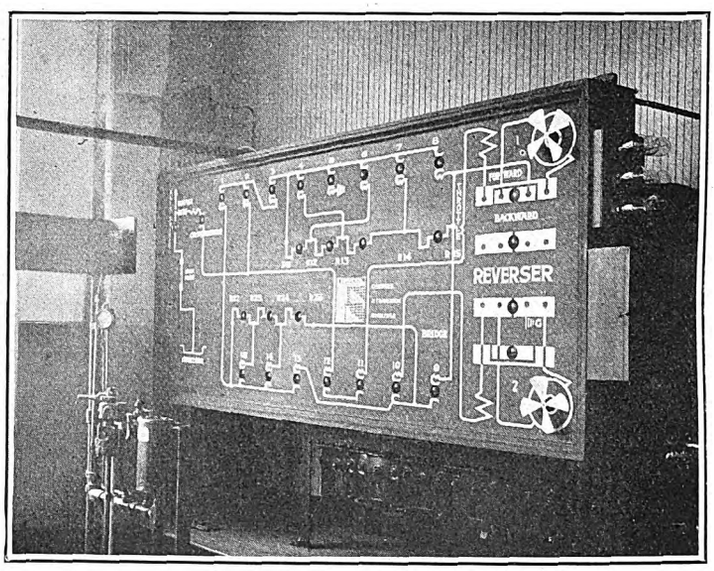
1. Regenerative braking unit: A railway motor operated as a series motor from 600 volts d.c. with a series resistance and a K type controller.
2. Elevated car unit, complete, with G.E. type M control and Westinghouse type AMME brake equipment, operating two railway motors. This unit is provided with electric couplers so that it can also operate in train connections with Westinghouse ALFM control and two other railway motors, the complete unit being a replica of that in use on the cars of the elevated division.
3. Elevated car unit with Westinghouse ALFM control and Westinghouse type ALME brake equipment, operating two railway motors. This equipment is provided with electric couplers so that it can operate in train with type M control and two railway motors. It is a replica of the train operated with type ALFM and type M control used on the elevated division.
4. East Boston Tunnel car unit with Westinghouse type AMME brake equipment.
5. Semi-convertible car unit with G.E. type M control and Westinghouse type AMM brake equipment operating two fan motors.
6. Semi-convertible car unit with G.E. type K-71-A control and Westinghouse type SM-3 brake equipment operating four fan motors.
7. Semi-convertible car unit with Westinghouse type HL control and Westinghouse type SME brake equipment operating four railway motors.
8. Center-entrance car unit with G.E. type PCS control and Westinghouse type SMKE brake equipment operating four railway motors.
9. Center-entrance car unit with Westinghouse type SMEE brake equipment.
10. Birney safety car unit with G.E. type K-63 control.

Students are classified into groups as motormen, conductors, and guards. Training of motormen is further subdivided for surface service and rapid transit service. The first part of the training of surface motormen is general instruction in the policies of the company and in the duties and responsibilities of the position. After this brief course, specialized training follows.

Each student is taken to the equipment room and there is instructed in the mechanism of the type of car that he is to operate. He is coached in the operation of control and braking. Much care is taken to make certain that he understands what constitutes abuse of rolling stock and what harm results from such abuse. It is deemed important that every motorman shall know not only why a car runs, but also in case of accident why it does not run. Each man must know the nature of every "hook-up," the purpose of every valve, and the function of every part. He must know how to prevent trouble; and what is more important, he must know how to trace trouble—how to overcome the problem of breakdowns.

After the preliminary instruction in the equipment room has been completed, the student is assigned to an instructor for platform training. The equipment room instruction is supplemented there. All points discussed in the classroom are demonstrated in actual operation. He is carefully coached in the stopping of a car by means of the air brake, and in the use of the hand brake; he is informed concerning regeneration; the effect of bad rail conditions and greasy track are explained; also the cutting out of motors, the replacement of fuses, diagnosis and remedy of minor troubles encountered on the road; the releasing of brakes that are set unexpectedly, the operation of electric track switches and rules of the road.





At Left, Various Types of Rapid Transit Equipment for Subway and Elevated Service Have Been Installed in the Instruction Room. At Right, Schematic Wiring Diagram of Rapid Transit Car Is Behind the Instructor's Platform

Following this intensive training on the platform, the candidate is further trained by a platform instructor who is assigned for the purpose of observing the efficiency of the previous training. This checking-up procedure takes on an average about 10 days.

After this the candidate returns to the school and again undergoes training in the equipment room. Smooth starting and stopping are insisted upon, as is also the proper handling of cars in all kinds of emergencies, such as failure of power, failure of brakes, traffic jams, etc. On the completion of this advanced training he is sent back to his station for further breaking in. He then is ordered to cover all routes, to acquaint himself with stops and street crossings. He is instructed in jacking up cars and the prevention of accidents. Having finally satisfied his breaking-in instructor concerning the operation of a car, he signs a breaking-in card and returns to the instruction school for a final written examination for a motorman's position.

This examination, if passed, merely certifies the

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student for the operation of one type of car. Before he is assigned to service on a division, he must pass examinations on all types of cars used on that division. In addition, he must also pass satisfactorily the test given for conductors, and when he has proved to the satisfaction of the supervisor of instruction that he has acquired a knowledge that covers the duties of both motorman and conductor, he is then allowed to go to work as a motorman and is placed on probation for 60 days.

On the rapid transit lines motormen are recruited from the train guards. If a guard wants to become a motorman he files his application with the supervisor of instruction and is first given an examination on rules. A man is allowed 20 days to prepare for this examination, and if it is passed satisfactorily, he is instructed in brake equipment and control, and is shown by means of the demonstration board in the equipment room how the current from the third rail passes to the motors, how the control and motor circuits act in service, the location and function of all switches and fuses, and the handling of the air brake.

The next step is his assignment to a breaking-in instructor. The candidate is given a thorough course in handling cars. During this period of training he returns as often as is deemed necessary to the equipment room, where special points are made clear and emphasized. When in the judgment of the breaking-in instructor the candidate seems competent to operate a car or train he is sent to the yard for two days, where he is shown how to make up trains, replace jumpers, couple cars, and where he acquaints himself with the position and function of switches, cocks and valves.

Having completed this course in training the candidate then presents himself for examination. After passing a written test he is certified and allowed to go on probationary duty. If he makes good he is given a permanent assignment. If not, his training and probationary period are extended 30 days, or he is denied appointment as a motorman and returns to his former rating as guard.

The student conductor is instructed in the use of fare boxes and registers, and is trained in the making out of trip reports and car cards. Special emphasis is given to methods of checking results of day cards, and, when necessary, simple arithmetical computations are explained in detail. Accident reports and other incidental forms are discussed and used as practice reports. No trouble is spared in the preparation of the applicant for the duties of this position. Special attention is given to those rules most frequently broken and their significance is pointed out.

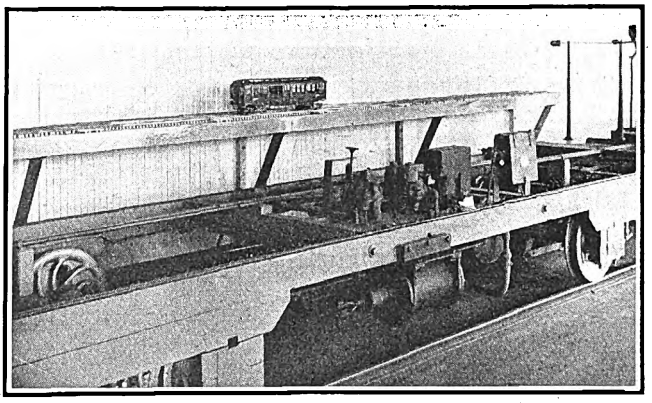
When a student understands the fundamentals of his position he is sent to a divisional carhouse and assigned to a traveling instructor, who places him with a platform instructor for breaking in. A final examination is then required. This is a written test which thoroughly covers the rules and procedure involved in holding a position as conductor. This examination is corrected by one of the staff of assistants in the presence of the applicant, who is further instructed on points which he had failed to answer correctly, or fails to make clear.

The prospective guard is trained in much the same manner as the conductor. First, the qualifications necessary to fill a guard's position are explained in detail; accident reports are discussed and explained; rule books and instruction books are provided, and general information relating to the position is given.

After this preliminary course has been completed, the candidate is sent to a traveling instructor, who places him with a platform instructor for breaking in. Four days are usually required for this purpose, after which the candidate is called back to the instruction school and further informed concerning the location of all switches, cocks and valves, as well as their functions. He is carefully coached with regard to flag, lantern and whistle signals, and after the completion of this training he is given practical training in flagging trains past a defective signal, together with the use of all signal appliances carried on trains.

The candidate, accompanied by his traveling instructor, continues until he has proved that he is thoroughly familiar with his duties as a guard. He receives a breaking-in card at the expiration of the train instruction and then reports back to the instruction school for a final written examination. If this is passed satisfactorily, he is placed on probation for 60 days.

The time required to train a man depends on the individual. According to Mr. Morgan, an average would be about 2 weeks for a motorman. For a conductor less time is required, but no specified time is actually allotted. The only safe principle to follow is that the training period shall be as long as necessary to make the candidate secure in knowledge and experience before he is allowed to operate a car independently. The actual cost to the company varies, but computing on the basis of 2 weeks required, and wages of $3 per day for the candidate, the cost per man averages somewhat more than $75.



Braking and Coupling Operations Are Taught by Means of This Equipment

Harrow for Removing Packed Snow

THE Auburn & Syracuse Electric Railroad has found that a disk harrow is a most effective machine for removing packed snow from tracks in city streets. The company's first experience with a harrow for this service was after a very heavy snowstorm on Jan. 29 of this year. At the end of the storm, the snow was at a general level in the country of 36 in., and in the city of Auburn it had become so packed that an electric rotary sweeper made little impression on it. At first, an effort was made to clear the rails by workmen with pick and shovel. Finally, resort was made to a disk harrow, obtained from the local office of the International Harvester Company. This harrow was dragged by horses over the tracks and the furrows cut by it so loosened the snow that it could be easily removed.

On the interurban section the snow was removed by the Russell and rotary electric plows owned by the company.

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Electrification of Paris Suburban Railways

Multiple-Unit Equipments Made Up of Permanently Coupled Motor and Trail Cars Have Double-End Control—Faster and More Efficient Operation Has Been Secured

DURING 1924 considerable progress was made in the electrification of the suburban lines of the Chemins de fer de l'État (State Railways) in the Paris district. These routes lie in the heavily populated districts on the west of the city. Owing to the rapid growth of this territory and the difficulties of steam operation, electrification had been considered for a long time, but was delayed by war and post-war conditions. As a matter of fact, suburban electrification in the Paris district began as early as 1900, when the Compagnie des Chemins de fer de l'Ouest (Western Railway Company) electrified the stretch of track between its Invalides station and Versailles.

The State Railways operate out of three stations in Paris, viz., Saint-Lazare on the right bank of the Seine and from the Invalides and Montparnasse stations on the left bank. Of these the Saint-Lazare station is by far the most important. Some years ago a count showed that 60,000,000 of the 70,000,000 passengers leaving Paris on the State Railways made use of it.

Since 1910 the traffic has grown in volume and intensity, the latter being due to the advent of the 8-hour day. Traffic leaving Saint-Lazare during the evening peak, 5:30 to 6:30 p.m., increased from 13,000 passengers in 1910 to 18,000 in 1920 and to more than 23,000 in 1924.

Under steam operation the schedule speed of locals was 25 km. (15.5 m.p.h.) and of semi-expresses and expresses 35 to 45 km. (21.7 to 27.9 m.p.h.). With electrification, double-end trains can be broken up into any desired lengths, better distribution of seats secured and schedule speed increased. To permit this increase in speed, the tracks have been individualized according to the character of the trains run thereon, and the stops have been arranged in zones according to the traffic characteristics. Under steam operation 16 of the 27 tracks in the Saint-Lazare station were required for the short-haul suburban service. Electric operation will require only 11 tracks and increase the capacity to 44 trains an hour.

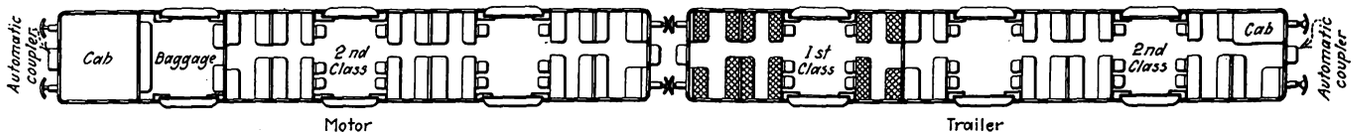
Power is generated at two stations, namely, Bezons in the north and Moulineaux in the south. Both are equipped with 5,000-kw., 15,000-volt, three-phase, 25-cycle turbo-alternators. Each station has a present output of 20,000 kw. and an ultimate output of 40,000 kw. Four of the nine eventual substations are now in service. They are equipped with 1,000-kw. converters, except two in the busiest territory, which have 1,500-kw. converters.

Current is furnished at 650 volts through a protected third rail weighing 76 kg. per meter (practically 152 lb. per yard) mounted in thermit-welded lengths of 18 m. (59 ft.) with expansion joints at intervals of 250 m. (820 ft.). The bonded track rails serve for the return circuit. Electrical equipment, both of the new lines and of the re-equipped original Invalides-Versailles electrification, is operated now at 650 volts, but can be used at 1,500 volts d.c. if the higher potential is later considered desirable.

The first electric locomotives installed had control at each end, a length of 13 m. (32.5 ft.), a weight of 51 metric tons (2,204 lb. per ton), four 120-hp. motors and a speed of 45 km. (27.9 miles) per hour. A larger type of multiple-unit control locomotive was developed when it was decided to run all trains electrically between Invalides and Versailles to eliminate the smoke nuisance of the Meudon tunnel, which is 3,600 m. (11,800 ft.) long. In April, 1922, 30 locomotives of this type were ordered from a group formed by the Thomson-Houston, Schneider and Jeumont interests. These machines are 12 m. (39.3 ft.) long, have truck centers of 6.1 m. (20 ft.), weigh 60 metric tons and have an output of 1,100 hp. with four motors at 750 volts. The normal speed on level track is 63 km. (39 miles) per hour, with a shunt connection to permit 70 km. (43.8 miles) per hour. On a 1 per cent grade the corresponding speeds are 42 to 45 km. (26 to 28 miles) per hour. The motors may be operated either self-ventilated alone or plus blowers which draw air from the interior of the locomotive through filter-fitted conduit. These locomotives may be run in twos and threes when necessary. They carry four third-rail shoes for line use and a compressed-air pantograph for station use.

Motor cars of multiple-unit type were installed as early as 1912. These carried two 235-hp. motors. The seating capacity is 40 and the maximum speed is 70 km. (43.8 miles) an hour. A second series of motor cars installed in 1921 were of the same design, but differed in trucks and electrical equipment. The two trucks per car had three axles, of which two were driving axles. The wheels were 0.925 m. (36.8 in.) diameter. These cars therefore carried four 165-hp. motors. The seating capacity is 62.

Greater capacities were necessary for the new electrification on the right bank of the Seine. The trains, therefore, are made up of one, two or three pairs of cars, comprising one motor and one trailer of the multi-side door type (three pairs of doors per side). These vehicles are of steel, having the maximum permissible width of 2.95 m. (9.64 ft.) and a height of 4.02 m. (13.2 ft.) above the rail. The over-all length outside of buffers is 19.92 m. (65 ft.). The wheels are of 1.1 m. (43.3 in.) diameter. The two trucks of the motor car carry four 165-hp motors. The seating capacity of a motor car is 72. The seats are arranged to permit a central aisle instead of the more customary European plan of a side corridor or no corridor at all. The closing and locking of the doors are con-



Floor Plan of One of the New Multiple-Unit Equipments

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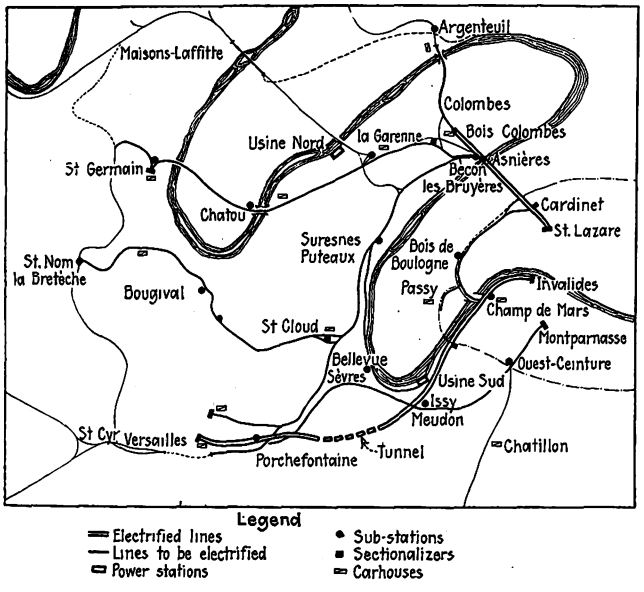
trolled electro-pneumatically by the motorman. Door opening is manual.

These latest motor cars weigh only 57 tons compared with the 73 tons of the smaller 1912 type. The capacity of 660 hp. per two-car unit equals 5.5 hp. per ton of train at maximum load.

The trailers are of the same general dimensions and appearance as the motor cars. They have control at the far end, so that every motor car-trailer unit can be run as a flexible double-ended unit. The weight of a trailer empty is 37.5 tons. The first-class compartment seats 34 and standing is not supposed to be permitted; the second-class compartment seats 56 passengers.



Paris Suburban Area Served by the State Railways

The new cars have been in use since May, 1924, with perfect satisfaction. They make the run to either Bécon-les-Bruyères or to Bois-Colombes in 11 minutes with stops at Pont Cardinet, Clichy-Levallois and Asnières. A 15-minute headway is maintained during the rush hours, to give the common intermediate stations a 7.5-minute service. It is expected that the electrification from Rueil to Saint-Germain and to Saint-Cloud will be carried out in 1925. The complete electrification of the Versailles lines on the right bank to Issy, Saint-Nom-la-Bretèche and Argenteuil is set for 1927.

Good Accident Record in Columbus

DURING the past 6 years the Columbus Electric & Power Company, Columbus, Ga., has reduced the number of accidents per 1,000 car-miles from 5.09 to 1.20. Each year has shown an improvement over the one before.

The gradual change-over in 1919, 1920 and 1921 from the old two-man type cars to the standard one-man safety car, together with the care taken by the operators, was responsible for a reduction in the number of accidents in those years.

In April of 1922 the operators were divided into two groups of teams known as the "Lions" and "Tigers." At a meeting of the trainmen held every 3 months two captains, one for each team, are elected. These captains then choose their men for the following 3 months. A friendly spirit of rivalry exists among these teams, each one striving for the best record. This has resulted in a further reduction in the number of accidents. Out of a total of 127 accidents in 1924, 75 were automobile accidents, and of these 75 accidents 40 were cases where the automobile ran into the street car.

ACCIDENT RECORD, COLUMBUS ELECTRIC & POWER COMPANY

		Accidents Related to Car Operation		Total Accidents		
Year	Car-Miles	Number	Per 10,000 Car-Miles	Number	Per 10,000 Car-Miles	Fatalities
1918	860,800	432	5.01	438	5.09	1
1919	941,957	549	5.84	553	5.87	1
1920	1,002,981	412	4.12	419	4.19	0
1921	1,028,309	299	2.91	305	2.97	2
1922	1,055,125	210	1.99	213	2.02	0
1923	1,094,672	171	1.56	179	1.63	0
1924	1,075,508	127	1.18	129	1.20	0

All accidents, regardless of who is to blame, are included in the total. For example, if an automobile collides with a street car while at a standstill it is counted as an accident despite the fact that the operator was in no way to blame. Taking into consideration the increase of automobile registration during this 5-year period, the record is thought to be extremely good.

Transfer Use Reduced 63 per Cent

WHEN the New York & Queens County Railway inaugurated 100 per cent one-man operation about 2 years ago it was found that the type of transfer used had a noticeable effect in reducing the speed of operation. Investigation showed also that many transfers were being fraudulently used. At that time transfers were of the P.M. coupon type with the month, day and year printed on the face. Separate transfers were used for each route and the one-man operator was required to indicate the time limit with a hand punch. As a result many transfers not properly punched, or not punched at all, were issued during busy periods by one-man car operators. After a study of the situation, the Moran type transfer was adopted. This transfer was described in ELECTRIC RAILWAY JOURNAL for Feb. 3, 1923, and July 7, 1923.

All four routes of the Queens County system now use the same Moran transfer. Round-trip riding and stop-over trips are prevented by cancellations made by the carhouse dispatcher when issuing transfers to the car operator. These cancellations indicate that the transfer is not good going to either of the terminals of the route issuing the transfer. The date is indicated by a "V," cancellation made in the edge by the dispatcher. The month is printed boldly in red. In addition to protection of the time limit given by the printed coupons transfer abuse is prevented by using contrasting colors in the morning and afternoon.

A marked reduction in the use of transfers has followed the adoption of this new style, as shown in the following table:

	Number of Transfers Ordered	Cost of Transfers
Dec, 1, 1922, to May 31, 1923.....	2,101,000*	$1,031.00
June 1, 1923, to Nov. 30, 1923.....	2,400,000	976.00
Dec. 1, 1923, to May 31, 1924	1,775,000	710.00
June 1, 1924, to Nov. 30, 1924.....	1,040,000	436.80
Dec. 1, 1924, to May 31. 1925.....	780,000	327.60

* Final order of the old style transfers.

Reduction in the use of transfers has come without any changes in routing and is attributed by the management to the decreased desire of passengers to take transfers which have an enforceable time limit, and also to the elimination of waste due to abolition of route transfers with a printed date.

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The Readers' Forum

New Name Proposed for A. E. R. A.

THE UNITED RAILWAYS & ELECTRIC COMPANY
BALTIMORE, March 3, 1925.

To the Editor:

For a while back some of us have been discussing the desirability of changing the name of the American Electric Railway Association. To my mind, this has rather been brought to a head by the appointment of a managing director of the association and the remarks of Mr. Brush at the Midwinter Meeting in Washington. I wish to suggest that perhaps we should change the name of our association to "The American City and Interurban Transportation Association" and that we should broaden its scope, so as to include other forms of transportation. This will put us not only potentially but practically in the position of wanting to furnish all the transportation for the territory we serve.

A committee on the revision of the constitution and by-laws of the association has just been appointed. It seems to me this particular problem can well be settled so that whatever changes are wise can all be included in the revised constitution, which will be presented to the convention next October. L. H. PALMER,
Vice-President and General Manager.

More on Inspections for Special Trackwork

R. W. HUNT COMPANY
CHICAGO, Feb. 25, 1925.

To the Editor:

The editorial reference to the importance of special trackwork in the JOURNAL of Feb. 14, 1925, is timely and pertinent.

If competent inspection service on this class of material is as rare as assumed it is almost entirely due to the failure of purchasers to specify thoroughly and accurately just what is desired, but rather to leave questions of quality and workmanship for argument between the inspector and manufacturer. Orders are frequently issued for an important and expensive frog or crossing with no mention of a specification, but simply to some manufacturer's design. Then the inspector is more or less helpless, and the inspector's chief function is merely to check the dimensions.

When special trackwork is bought to a definite specification and design, agreed to by both purchaser and manufacturer, exactly as rails are bought, inspection service will be found adequate in every detail. It would be interesting to know what electric railway mileage actually specifies A.E.R.E.A. specifications for the purchase of special trackwork. C. W. GENNET, JR.

Rapid Transit Traffic Grows 80 per Cent in Ten Years

STATISTICS on the rapid transit traffic in New York City recently compiled for the New York Transit Commission by Daniel L. Turner, its consulting engineer, show an increase of 86 per cent between 1913 and 1923. During this time there have been a number of new routes and new stations, resulting from the dual contracts, which were signed in 1913. The total number of passengers on the rapid transit lines in 1913 was 809,600,000, and in 1923, 1,506,100,000.

Special study was made of the increase in traffic districts in Manhattan Borough, New York, below 59th Street. For the purposes of comparison, Mr. Turner has divided this district into nine groups or territories, as shown in the accompanying table. Two of these, groups 5 and 8, include a single cross street only. The notable feature of this compilation is the great increase in the uptown district or that from 33d Street to 59th Street, as compared with either the downtown groups (1 to 3) or the intermediate groups (4, 5 and 6). The results indicate that there has been a marked movement of business activities from downtown to the upper district.

The figures in the table are also divided as between the two rapid transit companies, the Interborough Rapid Transit Company and the New York Rapid Transit Corporation (B.-M.T. Company). It should be pointed out that the latter company had only two stations in lower Manhattan in 1913, before the construction of its Broadway subway line. These two stations were the terminals of the Williamsburg Bridge and of the Brooklyn Bridge. The figures that are given for 1913 are of its traffic at those bridge stations.

TICKET SALES ON NEW YORK RAPID TRANSIT LINES 1913 AND 1923, SOUTH OF 59TH STREET, IN MANHATTAN

Group No.	Stations	Number of Stations Included in Group 1913	Number of Stations Included in Group 1923	Ticket Sales Year Ending June 30 — 1913 — Total, in Thousands	1913 — Per Cent	1923 — Total, in Thousands	1923 — Per Cent	Increase from 1913 to 1923 — Total, in Thousands	Increase from 1913 to 1923 — Per Cent
1	Battery to and including Wall Street	8	12	27,385	7.3	51,694	7.7	24,309	88.8
2	North of Wall to and including Fulton	4	7	24,781	6.6	46,630	6.9	21,849	88.2
3	North of Fulton to and including Chambers	9	13	73,977	19.7	78,271	11.6	4,294	5.8
4	North of Chambers to south of 14th Street	24	33	82,241	21.9	127,013	18.8	44,772	54.4
5	14th Street	5	7	25,618	6.8	59,604	8.8	*33,986	132.6
6	North of 14th Street to south of 33d Street	13	18	47,486	12.7	74,738	11.0	27,252	57.4
7	33d, 34th and 38th Streets	6	9	21,130	5.7	69,864	10.3	48,434	229.0
8	42d Street	7	8	40,988	10.9	104,089	15.4	63,101	153.9
9	North of 42d Street to limit (59th Street) of area	13	18	31,491	8.4	64,352	9.5	32,861	104.4
Total:	1-3	21	32	126,143	33.6	176,595	26.2	50,452	40.0
	4-6	42	58	155,345	41.4	261,355	38.6	106,010	68.2
	7-9	26	35	93,609	25.0	238,005	35.2	144,396	154.2
	1-9	89	125	375,097	100.0	675,955	100.0	300,858	80.2
By Companies:									
	1-3 Interborough Rapid Transit	20	26	91,622	24.4	122,373	18.1	30,751	33.5
	1-3 New York City	1	6	34,521	9.2	54,222	8.0	19,701	57.1
	4-6 Interborough Rapid Transit	41	48	141,526	37.7	191,718	28.4	50,192	35.4
	4-6 New York City	1	10	13,819	3.7	69,536	10.3	55,827	403.9
	7-9 Interborough Rapid Transit	26	29	93,609	25.0	189,412	28.0	95,803	102.3
	7-9 New York City		6	....	....	48,594	7.2	48,594	....
	1-9 Interborough Rapid Transit	87	103	326,757	87.1	503,503	74.5	176,746	54.0
	1-9 New York City	2	22	48,340	12.9	172,452	25.5	124,112	256.7
	Group 2 with the Cortlandt Street terminal of the H. & M. included	5	8	41,317	....	77,314	....	35,997	87.1

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Making Friends on the North Shore Line

A RECENT article in *Advertising and Selling Fortnightly* cites the experience of a member of its staff in using the service of the Chicago, North Shore & Milwaukee Railroad. This experience illustrates in a striking way the interpretation which is placed on the term "service" and is an example of the methods by which this road makes friends of its patrons. The article in part reads as follows:

"One of the *Fortnightly* staff recently had occasion to test the sincerity of this road's service advertising. Illness in his family made it imperative for him to catch a 10 o'clock train out of Milwaukee for Chicago. He was in Fond du Lac, Wis., 64 miles from Milwaukee, and had but 2 hours to drive there in his car. He called the North Shore Line train dispatcher and told him the situation. Would he hold the train a few minutes? 'We'll do our best,' said that obliging official.

"He arrived at the station at 10.02, two minutes after the train's leaving time, but there it was, waiting. Not satisfied that they had done enough, the North Shore Line officials went out of their way to see that the rest of the party in the automobile, who had to drive on to Chicago with the car, were taken to the outskirts of Milwaukee and started on the right road, which they might have missed in the dark.

"Ten years ago this road was in the hands of a federal receiver. Today it is a profitable growing property. That's what happens when a company gets the service attitude—and let's people know it."

Association News & Discussions

Iowa Association to Meet at Waterloo

A JOINT convention of the Iowa Electric Railway Association and the Iowa section of the National Electric Light Association will be held at Waterloo on June 3 and 4. One of the sessions on the second day will be a joint meeting of the two associations. June 5 and 6 will be devoted to a golf tournament to those who desire to participate.

Joint Utility Meeting in Illinois

THE fifth joint convention of the three Illinois utility associations, comprising gas, electric and railway companies, will be held on March 18 and 19 at the Hotel Sherman, Chicago. For the first time at a state utility convention there will be a utility advertising exhibit.

Joint sessions will be held each morning, while the individual sections will hold their own meetings in the afternoon. On the program for the first morning session is an address on "The Future of Electric Railways," by J. P. Barnes, president Louisville Railway. Merchandising, maintenance, safety, and the bus are among the subjects to be discussed at the electric railway sectional meetings. The meeting will conclude with the annual banquet on Wednesday evening.

Regional Planning Congress to Meet in April

THE first international town, city and regional planning conference in the United States will be held in New York City, April 20 to 25, at the invitation of Governor Smith and several local organizations interested in this work. An exhibit of city planning material from all over the world will be shown at the Hotel Pennsylvania and also at the Grand Central Palace, the latter as part of the exhibit of architectural and allied arts, under the auspices of the American Institute of Architects and the Architectural League of New York, which will meet in conjunction with the city planning congress.

The conference is expected to be of especial interest and value as it will give opportunity to secure first-hand information upon an important field of city and regional development, namely, the better distribution of population and its effect on problems of transportation and traffic.

City planning in European countries has been approached chiefly from the angle of planning for housing and for the better use of land, rather than the mere platting of streets and laying out of land. The housing shortage in this country and the increased cost of building have emphasized the need of giving more attention to the actual distribution and character of building.

A preliminary program of subjects to be discussed at the conference includes the following which are likely to be of interest to railway men: "Transportation in the New York Region," "Traffic," and "City Planning as a Permanent Solution of the Traffic Problem."

Birney Club Elects

THE regular monthly meeting and dinner of the Birney Club was held at the Missouri Athletic Association, St. Louis, on March 2. For the ensuing year the following officers were installed: Edwin B. Meissner, president; F. A. Richards, vice-president; B. W. Stemmerich, secretary; Otis Turner, treasurer. An interesting paper was read by B. W. Stemmerich, St. Louis representative of the Westinghouse Electric & Manufacturing Company, on railway motors covering developments in the last 34 years.

American Association News

Special Reports Available

THE following special reports of the Bureau of Information and Service of the American Electric Railway Association have been prepared and are available to member companies in good standing upon request.

Bulletin No. 11—Wages of Trainmen.—This is an entirely new edition of the regular Wage Bulletin, based on replies of more than 450 companies to a questionnaire sent out in February. It shows the present wage scale, effectitve date and date of expiration, previous scale, union affiliations of trainmen, number of men employed, contract conditions governing wage scale and the average weekly wages earned by the men under the scale.

Bulletin No. 12—Wages of Bus Men.—This is the first bulletin of bus men's wages issued by the association. It has been made necessary by the rapid increase in the bus operations of electric railways. The bulletin shows substantially the same information for bus operators as is shown in our bulletin of trainmen's wages, namely, present scale paid, effective date, date of expiration, union affiliation of bus men, number of bus men employed, average weekly wages earned under the scale, etc.

Bulletin No. 13—Schedule Analysis.—A summary of schedule data on fifteen of the larger operating companies. Shows, for average week-day schedules, proportion of hours used in running time and layover, the car-hours, run pay-hours and trainmen's pay-hours, the distribution of run allowances and pay allowances, car-mile schedules, schedule speeds, proportion of early, late and swing runs and one and two-man runs; also contains reproductions of the schedule summary sheets used by the several companies.

Bulletin No. 14—Motor Bus Operations in the United States, Part III.—This is the third installment of the list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operations and, where the information is available, statistical data on the character of their operations. The present installment covers the states of Kentucky and New York.

In addition to the above, supplements to the Fare Bulletin and Cost of Living Studies have been prepared, bringing them down to date.

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Maintenance of Equipment

Removing Motors Without Lifting Car Bodies

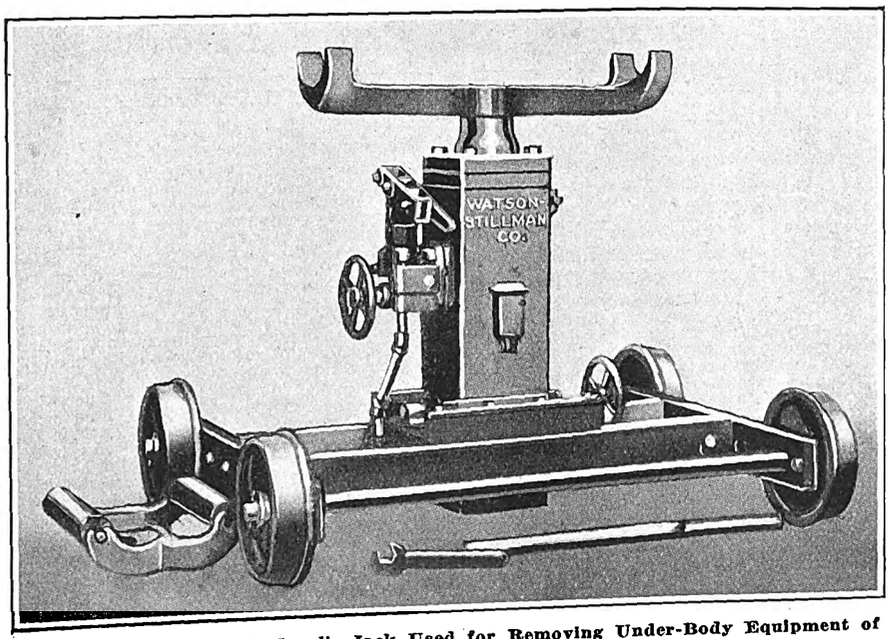
THE shops of the Northern Indiana Power Company at Kokomo, Ind., were originally provided with a drop pit and stationary jack for removing wheels and motors from electric cars. Difficulty was sometimes experienced from the necessity of stopping the car exactly over the jack in order properly to remove the motors. Frequently it was necessary to move the car back and forth over the pit several times, and as the clearance was small, the method was found to consume considerable time as well as being a source of danger to workmen.

An adjoining pit in the shops has recently been fitted up with a Watson-Stillman traveling telescopic motor-lift hydraulic jack, which has been found ideal for changing wheels, armatures, compressors, grid resistors, brake cylinders, air reservoirs and other under-body car equipment parts. The traveling jack in its original design was intended to run at the top of the pits. The track gage of the jack was thus considerably greater than that of the standard track. In the installation at Kokomo the track for the jack has been placed in the lower corners of the pit, which is 80 ft. long.

To remove a motor with the new equipment the car is run over the pit so as to leave from 3 to 5 ft. of open pit space at one end. The jack is then pushed into position and raised under the motor, which is to be removed, so as to support the motor. The axle caps, gear case, suspension bolts and the bolts from one end of the truck suspension bars are then removed, so as to make it possible to swing the entire motor around the axle and lower it with the jack. A man can then push the jack with the motor to the end of the pit, where the motor can be lifted off with a crane.

The usual maintenance method of the railway is to use spare motors and armatures and one of these is installed in place of the parts removed. With this new arrangement it has been found possible to remove and change an armature from a 90-hp. motor in 45 minutes, whereas with the previous stationary drop pit an average time of 3 hours was taken.

The jack is built on a rigid frame with flanged wheels for running lengthwise of the pit. Crosswise movement is also provided by movement on the framework on two channel irons. In the Kokomo shop a special cradle fits under the armature housings.

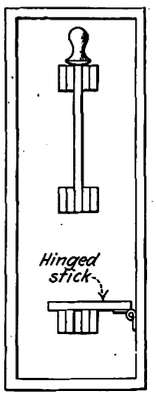


Telescopic Motor-Lift Hydraulic Jack Used for Removing Under-Body Equipment of Electric Cars at Kokomo, Ind.

Hinged Stop for Double-Throw Switches

BY G. H. MCKELWAY
Engineer of Distribution Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y.

IN USING double-throw switches it is quite important to provide a protection so that when the switch blade is pulled out from either set of contact clips gravity will not cause it to drop down into contact with the lower clips. This trouble is particularly likely to occur when the switch blade is pulled out quickly from the upper clips and the person opening the switch releases the handle before it has been brought to a stop.



Hinged Wood Bar Prevents Accidental Closing of Switch

Many types of stops or housings have been used to prevent this, but a majority consist of loose parts which frequently become misplaced. The accompanying illustration shows a type of stop which has been used with considerable success for switches installed in boxes out on the line. It consists of a wooden stop bar hinged on the side of the switch box, and so arranged that when the upper connection is made, which is normal position, the bar drops by gravity over the lower clips. To make use of the lower clips it is necessary only to raise the bar to the vertical position until the switch blade is thrown down. Whenever a switch is thrown to the upper position the stop will drop across the lower contacts by its own weight.

Melting Babbitt from Old Bearings

THE accompanying illustration shows a furnace used for melting babbitt out of old bearing shells in the Hillcrest shops of the Toronto Transportation System. The furnace is constructed of brick and has a sheet-iron door in one end. The interior is provided with a shelf on

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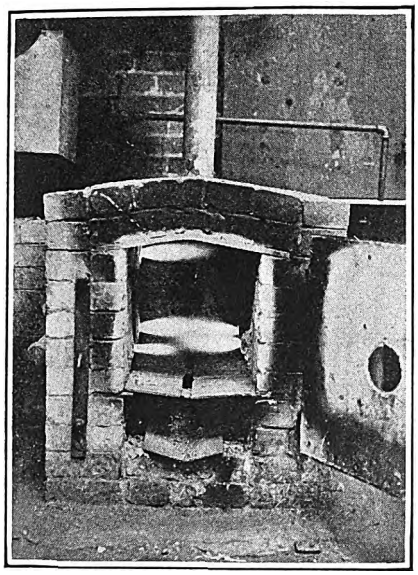


Furnace for Melting Old Babbitt Out of Bearing Shells

which the bearings are placed. The furnace is gas-heated and the shelves are sloped toward the center and front so that the babbitt will drop to the lower part and run to the front end, where it is formed directly into pigs in the molds which are placed just in front of the furnace. The exhaust system of the forge shop in which the furnace is located is connected so that the fumes are drawn away.

The advantage claimed for this method of removing babbitt metal from bearing shells is that as soon as the babbitt reaches a low melting point it is recovered in the molds, with the result that it has in no way been injured for further use.

Sanding Truck a Great Time Saver

A SANDING truck recently constructed in the 96th Street shops of the New York & Harlem Railroad, New York, N. Y., has been found a great convenience as well as a great time saver. Where a particular piece of track or car line is to be sanded the truck can go directly to the job by the shortest route, and does not need to follow the car tracks. When once on the job the work can be done more rapidly and with less danger of congestion. If the truck overtakes a car in operation it can pull out around it and sand the track ahead, and in sections where street traffic is congested the truck can pull to either one side or the other of the track a considerable distance and still not interfere with the sanding operation.

Accompanying illustrations show the construction of the truck. A standard Mack 5-ton truck chassis is used. The body was constructed in the company's shops and has capacity for 7 cu.yd. of sand. Standard mechanism is used for raising and lowering the front end of the truck, and in regular operation the body is raised slightly at the front, so as to provide for sand flow to the rear by gravity. A false floor is also provided which slopes to the rear and also transversely to the openings for receiving the sand. A large hopper is provided at the rear left-hand side and a 4-in. pipe runs along this side to the front of the truck underneath the false flooring. From this pipe six branches are taken off to run to each side of the bin.

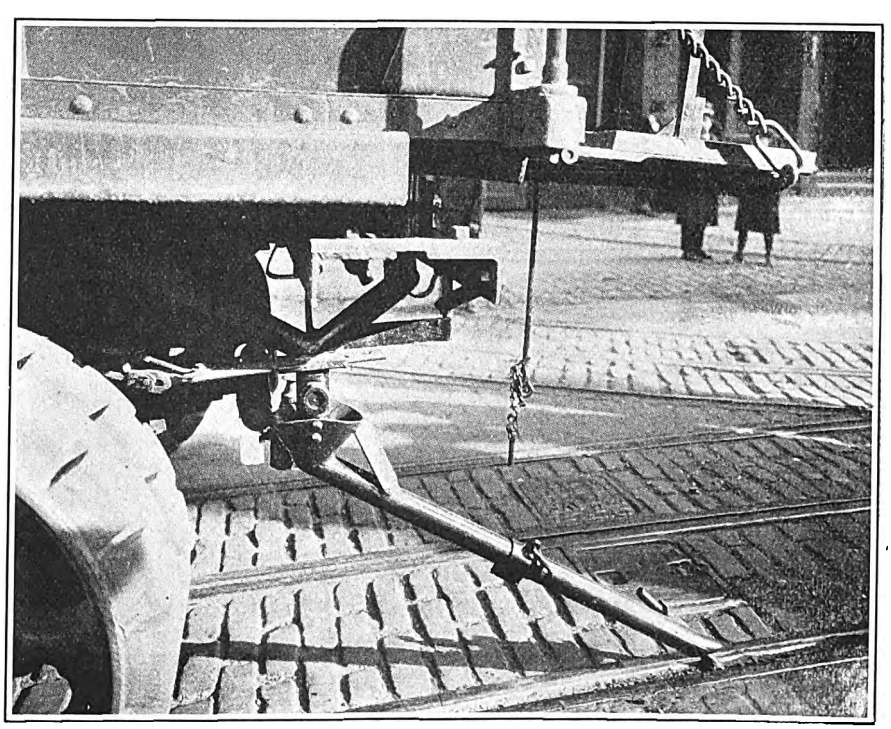
The sand valve and pipe for conducting the sand to the rail are located at the rear left-hand side. The valve consists of a casting with a 2-in. inside diameter. The top of this is provided with a slide, which regulates the size of the opening or provides for completely shutting off the sand as required. This slide is actuated from the driving cab by two types of control. One method of control is through the foot brake lever, so that whenever this is depressed to apply the brakes and slow down the speed of the truck the flow of sand is automatically decreased or shut off when the brakes are completely applied. Another control is

Sanding Track by Means of a Truck Sander

by means of a side lever. This is independent of the foot control and is used whenever it is necessary to shut off the sand entirely and still continue operating the truck in the normal manner. The connections from the foot and hand lever to the slide are made by steel rods.

From the close-up of the valve and pipe for conducting the sand to the rail it will be noticed that there are two lead-in pipes. The one to the rear of the truck is from the hopper, while the one toward the front end of the truck comes from the pipe with branches which run along the left-hand side. It is found with this method of providing several places where the sand can enter that the body can be almost completely emptied of sand without difficulty.

The pipe which conducts the sand



Sanding Valve and Pipe for Conducting the Sand to the Track

The truck is also arranged so that a snow plow nose can be mounted on the front for snow removal. The rear has two angle-iron cross-members with connection to the rear axle. This is provided for mounting a slot cleaning scraper for cleaning the underground conduit slot used in New York City.

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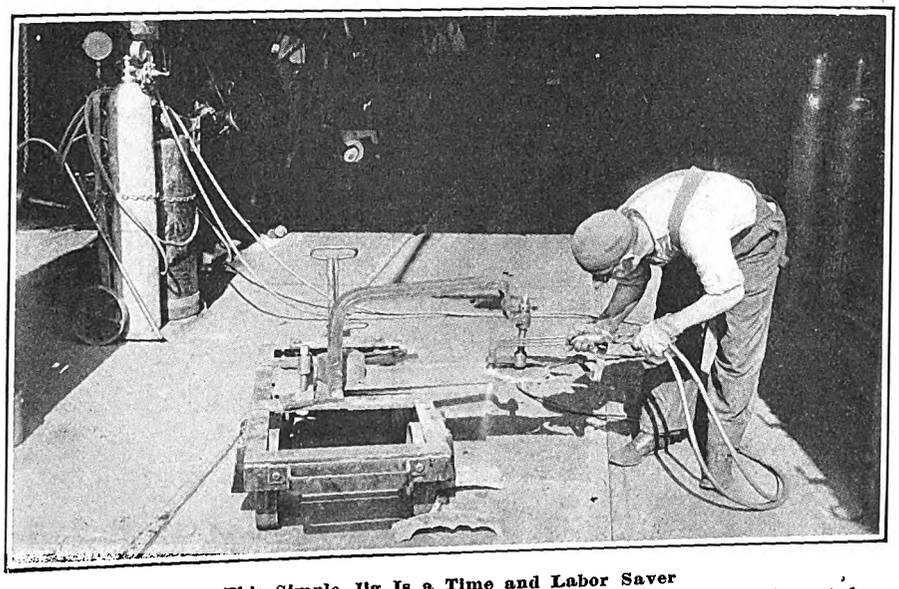
to the track is arranged with a swivel joint at its upper end so that it can be raised and lowered and also will swing sidewise of the track. The lower end of this pipe has a steel rod which fits into the groove of the rail and so follows this regardless of whether the truck is following the track exactly or not. The sand bin is made of wood with steel reinforcing. The covers are also of wood, but are covered with canvas so as to make them watertight. The covers are also sloped toward the edges so as to shed water readily.

A small platform is provided at the rear with a chair, so that a man additional to the driver can be carried. The duties of this man are to raise and lower the principal conducting arm at the back whenever it is necessary to pull out from the car track or to stop the sanding operation. A buzzer signaling system is provided so that the man at the rear can signal the driver the same as a conductor of a street car does. When the sanding arm is not being used it is swung around crosswise of the truck and hooks up out of the way. The truck is also arranged so that a snow plow nose can be mounted on the front for snow removal.

Jig for Cutting Circular Disks with Torch

BY T. E. WOOD
Master Mechanic Omaha & Council Bluffs Street Railway, Omaha, Neb.

CIRCULAR disks are cut from sheet steel with an oxyacetylene torch and the simple jig shown in the accompanying illustration, which was taken in the shops of the Omaha & Council Bluffs Street Railway. When special machinery for the purpose is not available, the method illustrated offers a handy and satisfactory substitute. A forged arm with a base plate at one end is arranged so that it can be mounted in any convenient position by means of an ordinary machinists' clamp. A supporting frame for the torch is pivoted in the end of the arm and is arranged so that it can be adjusted to give a circle of any given radius within the limits of the jig.



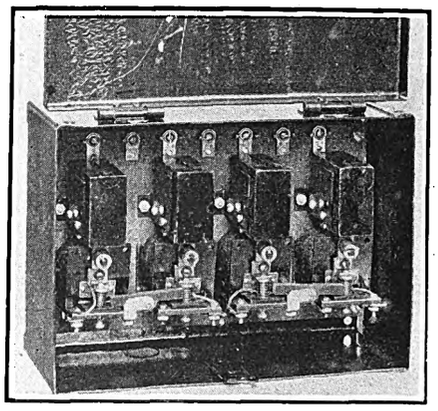
This Simple Jig Is a Time and Labor Saver
In the shops of the Omaha & Council Bluffs Street Railway this equipment enables circular disks of various sizes to be cut from sheet steel with an oxyacetylene torch.

New Equipment Available

Starter for Motors in Hoist Service

A NEW reversing starter bearing the designation "CR-7009-M4" has been designed by the General Electric Company, Schenectady, N. Y., particularly for monorail hoist service such as is common in electric railway shops. It is very small and compact and is recommended for other applications in addition to that of hoist service where economy of space is essential.

This starter may be used with either alternating or direct-current motors, and in operation throws the motor directly on the line. It consists of four single-pole contactors mechanically interlocked and mounted on a suitable base which is inclosed in a small sheet metal case for wall mounting. A push-button station is provided for operating the contactors, which are so arranged that the motor will run only as long as the push-button remains depressed.



Reversing Starter for Monorail Hoist Service

The over-all dimensions of the inclosed device are width 14 in., height 9 in., depth 6 in. Knockouts are provided for ¾-in. conduit. The construction is so arranged that the cover may be locked shut if desired.

Recording Instrument for Car Tests

AN ELECTRICAL measuring and recording instrument which provides five simultaneous records is being marketed by Evershed & Vignoles, electrical measuring instrument manufacturers of London, England. The instrument is designed to be connected in the electric car circuit so as to give simultaneous records of speed, motor amperes, voltage, brake application and stops. The five records are plotted side by side on two charts driven by a common clock mechanism. In order to prevent cramping of the records, the instrument is fitted with a chart speed of 6 in. per minute. Other chart speeds down to ½ in. per minute can be arranged without change of the clock mechanism.

The time lines on the records are straight, and so it is a convenient matter to compare simultaneous values of the various records. Particular attention has been given in the design of this instrument to prevent interference from vibration of the car and equipment. Difficulties from vibration have been overcome in the new instrument by special damping devices and special pen construction. An oil dashpot is used of tapered form, so that wave motion on the surface cannot be built up to increase the vibration effect.

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The News of the Industry

Eight Cents in Buffalo

Commission Rejects City's Five-Cent Fare—Allows Eight per Cent on $22,857,335 Value

Fares in Buffalo, N. Y., were increased to 8 cents or two tickets for 15 cents on March 3 after the Public Service Commission had announced its decision on the application of the International Railway for a higher rate. The fare previously had been 7 cents or four tokens for 25 cents. The new rate will remain in effect until April 1, 1926, or until changed by another order of the commission. Tokens will be accepted by conductors with the payment of an extra cent for fare, but tickets are to replace them in future.

For rate-making purposes, the Public Service Commission fixed the value of the properties of the International Railway in Buffalo at $22,857,335, a cut of 85 per cent in the valuation of $60,000,000 placed on the property within the city by the International Railway and an increase of more than $8,000,000 over the valuation placed on the property by the city in its fight for restoration of the 5-cent fare. The legal expenses and other costs to the city in its unsuccessful attempt to have a 5-cent fare restored were more than $25,000.

In arriving at the new rate of fare, the state utilities board disallowed claims for funds turned over to Mitten Management, Inc., Philadelphia, by the Buffalo system for services performed for the local company. The commission held the company has an executive staff competent to manage its own affairs, but that if the owners of the property desire additional management, it is a matter with which the commission has no concern except to say that the expenses should be borne by stockholders and not by car riders.

VALUATION FIXED

The commission permits an 8 per cent return on the valuation allowed for the city properties. The board estimates that the 8-cent fare or two tickets for 15 cents will produce for the company in 1925 the following results: Return, $1,828,335; operating expenses and taxes, including depreciation, $7,096,689; revenues required to meet return and expenses, $8,925,276. The revenue is estimated as follows:

Passengers	
3,975,000 at 3 cents	$ 119,250
101,500,000 at 7½ cents	7,612,500
14,000,000 at 8 cents	1,120,000

This makes a total revenue from fares of $8,851,750. Revenue from other sources is estimated at $95,000, making the total revenue for the company $8,946,750.

The commission in fixing the new rate says the annual fixed charges of the International for interest on funded debt and other deductions from gross income are more than $1,500,000, not all of which can be chargeable to the Buffalo system. In 1924 the International operated 444,799 more car-miles and 56,228 more car-hours than in 1921, while revenues decreased from $8,078,775 to $7,777,072. Expenditures for maintenance of way, structures and equipment, traffic and general and miscellaneous expenses were higher in 1924 than in 1921, but expenses for power, conducting transportation and taxes were lower. The commission found a progressive falling off of passenger traffic in recent years, due, it says, to increasing competition of privately owned automobiles.

The decision of the commission says:

> Adequate street car service, however, is vital to the prosperity of any community. As yet no other system of transportation has been devised to handle urban traffic as well, especially during rush hours. Adequate service depends upon an adequate rate of fare. With an adequate fare, however, there should be adequate service. One goes with the other. The company did not receive in 1924 that reasonable return on the value of its property devoted to public service to which under the statute it is entitled, and it can no more continue to serve the public at a loss and survive than can a merchant.

Members of the City Council say they will not appeal from the decision of the commission unless after adequate time the management does not provide more frequent service on all lines and does not definitely announce its intention of making certain improvements.

Chicago's Interest Their Interest

Offer of Railway Heads to Sell Properties to City Made in Behalf of Effort to Advance Chicago to Magnitude of First Rank Through Co-ordination

VAGUELY conceived nearly 20 years ago, the purchase proposition at Chicago which will go before the voters on April 7 represents 2 years of labor by Mayor Dever, Henry A. Blair, Samuel Insull, Alderman U. S. Schwartz, Major R. F. Kelker, Jr., and a host of associates to realize the ambition of an ideal local transportation system. This ideal consists of subway, elevated and surface carriers operated as a unit for one fare with free universal transfers and co-ordination of train movements.

The proposal is unusual in many ways, particularly the plan by which the city purposes to finance the purchase out of the system's earnings and without putting up a nickel. For their equity the owners of the property are to accept so-called Schwartz certificates, or notes. The state law makes these a first charge upon income.

The 50-ward Aldermanic election of Feb. 24 is regarded as making the referendum result practically certain. Only five of the opponents of the measure out of twenty-three backed by William Hale Thompson and the Hearst newspapers were elected. Seven others got enough votes to go into a run-off election on April 24. Twenty-seven Aldermen friendly to the plan were elected outright. When the ordinance reached the final vote in Council on Feb. 27 forty men voted in favor and five against. This is the Council strength, five seats being vacant.

As indicated at greater length elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL, the ordinance provides tripartite control by a board of nine men during half the payment period, or 20 years. The city will name three men, the security holders of the surface and elevated lines will name three and a joint conference will name three subject to vote of the County Superior Court *en banc*. Terms will be for 9 years. When the city has retired 51 per cent of the notes, the operating board will be reduced to seven, with four named by the city.

It is purposed to name the board in May and have it issue some Schwartz certificates, which will be subjected at once to a friendly test case to be carried to the Supreme Court. The required amount will then be issued to pay for the elevated and surface lines. More paper is outstanding for both systems than is represented by the sale prices. Notably in the case of the surface lines will the need arise for working out an arrangement under which holders of the many issues may share equitably in the new traction notes.

Meanwhile Major Kelker will rush subway engineering details so that digging can begin in September. The city has $40,000,000 in cash for the first unit. Most of the work will be cut and cover. Much has been planned on the layout of the tubes by Bion J. Arnold.

Samuel Insull, though sharing with other utility men the justified mistrust of either municipal ownership or operation, had refused for a long time to set a figure on the elevated lines, but at the last minute he reopened negotiations and even made a substantial compromise in the city's favor. He explained this later over the radio to the public. He said:

> I want to urge you to give very friendly consideration to the transportation proposition that will come before the voters. A development of rapid transit in the largest sense of the word is urgent and we must have it, I care not by what scheme.
>
> This scheme primarily brings together the surface and elevated lines. The prices

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do not represent two-thirds of what it would cost to reproduce them. Speaking for the elevated lines, I am a long way from being satisfied with the price and so will be everybody else. But what we owners want is what the whole city wants; that is, to provide the facilities that will lead the community ultimately to become the greatest city of this western hemisphere.

There is a possibility that the assessment method of financing extensions giving service to particular districts may be adopted. Alderman Wiley W. Mills, head of the Public Ownership League of America, offered an amendment to that effect, but it was sidetracked when the authors of the ordinance expressed the belief that a method of this kind was possible under clauses already written in the bill. After lawyers have considered and determined the matter definitely, this will be taken up again.

Several hundred amendments were waiting for the ordinance on the floor and forty-seven, relating mostly to misplaced commas or undotted i's, were adopted. Two were important. Eight miles of subway formerly listed for construction in the second 10-year period was moved up to the immediate list. Provision was made that subway stations downtown should not be more than 1,000 ft. apart.

Interstate Bus Case Decided

United States Supreme Court Rules that Regulations Sought to Be Imposed by State Commissions of Washington and Maryland Are Unconstitutional

IN AN opinion read on March 2 by Justice Brandeis, the United States Supreme Court declared unconstitutional the Washington State law prohibiting common carriers for hire from using the highways of that state between fixed terminals or on regular routes without having obtained a certificate of public convenience and necessity from the state, in so far as it applies to interstate carriers.

On the same day the Supreme Court, also through Justice Brandeis, reversed the Maryland Supreme Court in the case of George W. Bush & Sons Company against the Public Service Corporation of Maryland. Maryland requires a permit for common carriers using its highways with fixed routes on regular schedules. The Bush company applied for a permit for exclusively interstate freight carriage and was refused. The state trial court and the state Supreme Court held for the Public Service Corporation. The United States Supreme Court reversed this case on the ground that the attempted administration of the state law was an invasion of the commerce clause of the Federal constitution. The highways involved in the Maryland case were not built or maintained with Federal aid.

Justice Brandeis, who delivered the opinion of the court, said in full:

This is an appeal, under Section 238 of the Judicial Code, from a final decree of the federal court for western Washington dismissing a bill brought to enjoin the enforcement of Section 4 of Chapter III of the laws of Washington, 1921. That section prohibits common carriers for hire from using the highways by auto vehicles between fixed fermini or over regular routes, without having first obtained from the director of public works a certificate declaring that public convenience and necessity require such operation. The highest court of the state has construed the section as applying to common carriers engaged exclusively in interstate commerce. (Northern Pacific Railway vs. Schoenfeldt. 123 Wash. 579; Schmidt vs. Department of Public Works, 123 Wash. 705). The main question for decision is whether the statute so construed and applied is consistent with the Federal Constitution and the legislation of Congress.

Buck, a citizen of Washington, wished to operate an auto stage line over the Pacific Highway between Seattle, Washington and Portland, Ore., as a common carrier for hire exclusively for through interstate passengers and express. He obtained from Oregon the license prescribed by its laws. Having complied with the laws of Washington relating to motor vehicles, their owners and drivers (Carlson vs. Cooney, 123 Wash. 441), and alleging willingness to comply with all applicable regulations concerning common carriers, Buck applied there for the prescribed certificate of public convenience and necessity. It was refused. The ground of refusal was that, under the laws of the state, the certificate may not be granted for any territory which is already being adequately served by the holder of a certificate; and that, in addition to frequent steam railroad service, adequate transportation facilities between Seattle and Portland were already being provided by means of four connecting auto stage lines, all of which held such certificates from the states of Washington. Re Buck, P.U.R. 1923 E, 737.

NOTE 1

An additional ground for refusing the certificate was that the applicant did not appear to have financial ability. This ground of rejection does not require separate consideration; among other reasons, because the plaintiff later asserted, in his bill, that he possessed the requisite financial ability, and the motion to dismiss admitted the allegation.

To enjoin interference by its officials with the operation of the projected line, Buck brought this suit against Kuykendall, the director of public works. The case was first heard under Section 266 of the Judicial Code, before three judges, on an application for a preliminary injunction. They denied the application. (295 Fed. 197). A further application for the injunction made after amending the bill was likewise denied. (295 Fed. 203). Then the case was heard by the district judge upon a motion to dismiss the amended bill. The final decree dismissing the bill was entered without further opinion. (See also Interstate Motor Transit Co. vs. Kuykendall, 284 Fed. 882.)

That part of the Pacific Highway which lies within the state of Washington was built by it with federal aid pursuant to the act of July 11, 1916, C. 241, 39 Statute 355, as amended Feb. 28, 1919, C. 69, 40 Statute 1189, 1200, and the Federal Highway Act, November 9, 1921, C. 119, 42 Statute 212. Plaintiff claimed that the action taken by the Washington officials, and threatened, violates rights conferred by these federal acts and guaranteed both by the Fourteenth Amendment and the Commerce Clause. In support of the decree dismissing the bill this argument is made. The right to travel interstate by auto vehicle upon the public highways may be a privilege or immunity of citizens of the United States. Compare Crandall vs. Nevada, 6 Wall. 35. A citizen may have, under the Fourteenth Amendment, the right to travel and transport his property upon them by auto vehicle. But he has no right to make the highways his place of business by using them as a common carrier for hire. Such use is a privilege which may be granted or withheld by the state in its discretion, without violating the due process clause or the equal protection clause. (Packard vs. Banton, 264, U. S. 140, 144). The highways belong to the State. It may make provision appropriate for securing the safety and convenience of the public in the use of them. (Kane vs. New Jersey, 242, U. S. 160). It may impose fees with a view both to raising funds to defray the cost of supervision and maintenance and to obtaining compensation for the use of the road facilities provided. (Hendrick vs. Maryland, 235 U. S. 610. See also Pierce Oil Corporation vs. Hopkins, 264 U. S. 137). With the increase in number and size of the vehicles used upon a highway, both the danger and the wear and tear grow. To exclude unnecessary vehicles—particularly the large ones commonly used by carriers for hire—promotes both safety and economy. State regulation of that character is valid even as applied to interstate commerce, in the absence of legislation by Congress which deals specifically with the subject. (Vandalia R.R. Co. vs. Public Service Commission, 242 U. S. 255; Missouri Pacific Ry. Co. vs. Larabee Flour Mills Co., 211 U. S. 612). Neither the recent federal highway acts, nor the earlier post road acts, Rev. Stat., Sections 3964; Act of March 1, 1884, C. 9, 23 Statute 3, do that. That state statute is not objectionable because it is designed primarily to promote good service by excluding unnecessary competing carriers. That purpose is within the states' police power.

The argument is not sound. It may be assumed that Section 4 of the state statute is consistent with the Fourteenth Amendment; and also, that appropriate state regulations adopted primarily to promote safety upon the highways and conservation in their use are not obnoxious to the Commerce Clause, where the indirect burden imposed upon interstate commerce is not unreasonable. Compare, Michigan Public Utilities Commission vs. Duke, No. 283, decided Jan. 12, 1925. The provision here in question is of a different character. Its primary purpose is not regulation with a view to safety or to conservation of the highways, but the prohibition of competition. It determines not the manner of use, but the persons by whom the highways may be used. It prohibits such use to some persons while permitting it to others for the same purpose and in the same manner. Moreover, it determines whether the prohibition shall be applied by resort, through state officials, to a test which is peculiarly within the province of federal action—the existence of adequate facilities for conducting interstate commerce. The vice of the legislation is dramatically exposed by the fact that the state of Oregon had issued its certificate which, despite existing facilities, declared that public convenience and necessity required the establishment by Buck of the auto stage line between Seattle and Portland. Thus, the provision of the Washington statute is a regulation, not of the use of its own highways, but of interstate commerce. Its effect upon such commerce is not merely to burden but to obstruct it. Such state action is forbidden by the Commerce Clause. It also defeats the purpose of Congress expressed in the legislation giving federal aid for the construction of interstate highways.

By motion to dismiss filed in this court, the state makes the further contention that Buck is estopped from seeking relief against the provisions of Section 4. The argument is this: Buck's claim is not that the department's action is unconstitutional because arbitrary or unreasonable. It is that Section 4 is unconstitutional because use of the highways for interstate commerce is denied unless the prescribed certificate shall have been secured. Buck applied for a certificate. Thus he invoked the exercise of the power which he now assails. One who invokes the provisions of a law may not thereafter question its constitutionality. The argument is unsound. It is true that one cannot in the same preceeding both assail a statute and rely upon it. (Hurley vs. Commissioner of Fisheries, 257 U. S. 223, 225. Compare Wall vs. Parrott Silver & Copper Co., 244 U. S. 407, 411). Nor can one who avails himself of the benefits conferred by a statute deny its validity. (Pierce Oil Co. vs. Phoenix Refining Co., 259 U. S. 125; St. Louis Co. vs. Prendergast Co., 260 U. S. 469, 472). But in the case at bar, Buck does not rely upon any provision of the statute assailed; and he has received no benefit under it. He was willing, if permitted to use the highways, to comply with all laws relating to common carriers. But the permission sought was denied. The case presents no element of estoppel. (Compare Arizona vs. Copper Queen Mining Co., 233 U. S. 87, 94, et seq.) *Reversed.*

Georgia Railway Controls Transportation in Atlanta

Permission was granted to a subsidiary company of the Georgia Railway & Power Company on March 3 by the City Council to operate coaches to serve Morningside and Sylvan Hills. Service will be started not later than March 8, when the anti-jitney ordinance becomes effective. In granting the joint petition of Preston S. Arkwright, president of the Georgia Railway & Power Company, and H. M.

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Atkinson, chairman of the board, the Council denied the applications of the Crosstown Express, Inc., and the Atlanta Colored Coach Lines, Inc., to operate on the grounds that their proposed routes would violate the ordinance barring jitneys from Atlanta streets.

The fare for any distance on the railway's buses or for the combination use of coach and street car will be 10 cents. The lines, however, will be only temporary and may be changed following the report of the special traction committee which is now studying the report of the John A. Beeler organization in connection with the relief petition of the railway.

The granting of full control of the transportation of the city to the Georgia company is the second of the recommendations of John A. Beeler that the City Council has acted upon favorably. Mr. Beeler and members of his staff recently returned to Atlanta from a four-day trip to New Orleans and Houston with Mayor Walter A. Sims of Atlanta and the special traction committee of the Atlanta City Council, headed by the Hon. J. L. McLendon. The party was accompanied by three reporters, representing all the daily newspapers of Atlanta.

Capital Traction Offers Old Scale in Lieu of Higher Wage

Motormen, conductors and bus operators of the Capital Traction Company, Washington, D. C., filed a petition on Feb. 25 seeking an increase from 58 cents to 70 cents an hour in their wages. The petition included a request of 25 per cent increase for workers other than trainmen. About 1,000 employees are involved. Immediately following the application, the company denied the petition and countered with a proposal to reduce the present scale. This will result in the matter going to arbitration and the company took the first step in that direction by announcing that Santon C. Peelle, an attorney, would be its arbiter.

The present wage scale is 52 cents an hour for the first 3 months, 56 cents for the next 9 months and 58 cents thereafter. The company will ask the arbitrators to consider the following reduced scale: For conductors, motormen and bus operators in the service on March 30, 1923—first 3 months' service, 51 cents an hour; next 9 months, 54 cents, and after 12 months, 56 cents; for conductors, motormen and bus operators employed after March 30, 1923—first year, 50 cents; second year, 52 cents; third year, 54 cents, and fourth year and thereafter, 56 cents; motormen and conductors acting as instructors or operating one-man cars would receive 5 cents an hour additional. The company proposes that no change be made in the wages of employees other than motormen, conductors and bus operators.

George E. Hamilton, president of the company, stated in conclusion that in view of the fact that the company and the men were so far apart in judgment and conclusions on the subject it would be useless to attempt an agreement by conference. He suggested that arbitration be resorted to as provided in the contract.

Home Rule for Buses

Ohio Cities Will Have Say Over Operating Rights—Cleveland Railway to Use Buses

Ohio cities are given full control over bus transportation within their boundaries, under a bill passed recently by both the Senate and House in the General Assembly. The bill becomes a law 90 days after the Governor affixes his signature to it. It is believed he will approve the measure inasmuch as he has declared himself to be in favor of the move. Up to this time the State Public Utilities Commission had jurisdiction over bus operation in cities.

The bill not only gives City Councils the right to say whether or not there shall be bus transportation in their cities and who shall run this form of transportation, but also takes from the control of the state commission the right to regulate bus transportation in Ohio municipalities and places contiguous to municipalities.

The bill was passed by both houses of the General Assembly only after a long and bitter fight. The new regulation was drawn specifically to meet the situation in Cleveland, where the Cleveland People's Motor Bus Company had sought a certificate of convenience and necessity from the State Utilities Commission. The Cleveland City Council and civic organizations fought the right of the state commission to grant any motor bus company the right to operate in Cleveland.

It is expected now that the Cleveland City Council will authorize the Cleveland Railway to operate buses in Cleveland; in fact, the railway is seeking to finance the use of buses as feeders to the railway system.

Council Approves New Milwaukee Operating Contract

The Common Council of Milwaukee, Wis., has voted 21 to 4 in favor of the ordinance containing the proposed service-at-cost contract to be entered into between the city and the Milwaukee Electric Railway & Light Company. The measure will be submitted to a vote of the people on April 7. If the contract is approved at that time it will go into effect on July 1, provided the Railroad Commission and the North American Company are agreeable. The contract will run for a period of 10 years, with the privilege of canceling it at the end of 8 years. It will be renewed automatically every 10 years, with the right reserved to the city to purchase the properties if the people vote in favor of municipal ownership.

Fare Plea Made to New York Governor by Interborough

The Interborough Rapid Transit Company, New York, on March 3 addressed to Gov. Alfred E. Smith and to the State Legislature a memorial and petition asking legal authority to charge a fare higher than 5 cents, as the speediest practicable way not only to insure the building of new subways for New York but also to provide improved service on the rapid transit lines now in operation.

The petition did not specify any precise figure for the desired rate of fare. In the brief recently filed by its general counsel, James L. Quackenbush, 7 cents was suggested, with the proviso, generally speaking, that 1 cent of each addition to the present 5-cent fare should revert to the city and the other to the corporation. It has been pointed out that, as the I.R.T. is now carrying 1,000,000,000 passengers a year, the additional 1-cent increment alone would put into the City Treasury $10,000,000 annually, which would provide for the annual interest upon the so-called "frozen credit," now a continuous burden upon the city's taxapayers.

Agreement in Albany Results in Continuation of Seven-Cent Fare

The 7-cent fare will be continued in Albany, N. Y., and permission will be granted the United Traction Company to operate gasoline-electric buses this spring over Western Avenue and over the route now served by the Arbor Hill trolley line. This was virtually agreed to at a conference on March 4 between city and traction officials. The agreement has no bearing on the application for a 10-cent fare on other United Traction lines in the Capitol district.

A meeting has been called for March 12, at which the final agreement is expected to be reached, and petitions will be presented to the Common Council at its next meeting for operation of buses. Mayor Hackett said the company had requested permission from the city to operate buses over Western Avenue and the Arbor Hill route and in return proposed either to withdraw or postpone for 12 months its application for a 10-cent fare in Albany. He said he would also withdraw his petition for an investigation of affairs and for a 5-cent fare.

One-Man Car Protest in New Jersey Peters Out

Despite complaints previously made against the operation of one-man cars on the Bloomfield line of the Public Service Railway, a hearing held by the Board of Public Utility Commissioners in Newark, N. J., on March 5 was very poorly attended. Fewer than 25 people were on hand when the meeting opened at 11 a.m., and the attendance dwindled to less than half a dozen by afternoon. More interest was manifested in the question of fare zone limits and connections between cars and trains at the railroad station in Montclair than in one-man car operation.

A general statement made at the hearing to the effect that all one-man operation of double-truck cars was unsafe was answered by A. T. Warner, assistant to the vice-president in charge of operation. He showed that there had been a reduction of nearly 20 per cent in boarding and alighting accidents, as told elsewhere in this issue. He also pointed out that because of the high cost to the railway of supplying this service no extension of the present fare zone limits could reasonably be asked for. The company volunteered to make a study of ways to furnish closer connections with railroad trains.

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News Notes

Seeks Higher Fare.—The Elmira Water, Light & Railroad, Elmira, N. Y., has filed with the Public Service Commission a complaint against the present 6-cent fare charged on its system and has asked the commission to fix a just and reasonable fare. The company alleges that the 6-cent fare is unjust in that it does not yield a sufficient revenue to pay the cost of service and give the company a fair and reasonable return upon the value of its property.

Wants 7-Cent Fare.—Having obtained consent of the municipalities through which its lines run to an increase in fares for a period of at least a year, the New York & Stamford Railway petitioned the Public Service Commission on Feb. 26 for permission to put a new tariff in effect on 3 days' notice. The line extends from Depot Square, New Rochelle, through Larchmont, Mamaroneck, Harrison, Rye and Port Chester to Stamford, Conn. It is proposed to charge 7 cents in each of the six operating zones except the first zone, the city of New Rochelle, where the 5-cent fare will not be changed. In the second and third zones the fare is now 5 cents, and in the fourth, fifth and sixth zones it is 6 cents. In 1921 the company's net income was $14,744. In 1922 there was a deficit of $18,979, in 1923 a deficit of $23,151 and in 1924 one of $13,290.

Another Hearing on Ten-Cent Fare Petition.—The Public Service Commission will hold a further hearing at Albany on March 11 in the matter of the application of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., for permission to charge a 10-cent fare. On Feb. 23 the company petitioned for a reopening of the case for the presentation of further evidence to the end that the full increase sought in the original petition might be granted. The commission on Nov. 12, 1924, issued an order granting permission to charge a 9-cent fare, but it denied the 10-cent fare.

Car Checks for School Children.—The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will issue car checks for use by school children under 10 years of age to be sold in strips of 10 for 30 cents. The introduction of these tickets was urged by the superintendent of schools.

New York State Mayors Urge Bus Legislation.—The New York State Conference of Mayors, in midwinter session at Albany, on Feb. 26 unanimously adopted the resolution presented by Mayor Frank X. Schwab of Buffalo urging the Legislature to enact a law that would give municipalities the right to operate buses and trolley cars.

Wants Service Extended.—Agitation has been started in Wausau, Wis., to have the Wisconsin Valley Electric Company extend its railway to supply service to residents on the west side, who are now forced to walk about half way to the business section of the city before they can board a car. Should the company find it uneconomical to make this extension, it has been asked to establish bus service as a feeder to the railway.

Denies Bus Petition. — The Public Service Commission recently denied the petition of David W. Jeram and David W. Jeram, Jr., for a certificate of public convenience and necessity for the operation of a bus line between Albany and Schenectady, N. Y., by way of Fuilderland and Carman. The commission held that adequate accommodations were supplied by bus lines and existing electric and steam railroad lines.

West Philadelphia to Have Buses.—Double-deck buses will be put in operation next summer on Chestnut and Walnut Streets between 63d and Broad Streets under franchises with the city which the Philadelphia Rapid Transit Company now holds. Ralph T. Senter, vice-president in charge of engineering, recently made this announcement and at the same time indicated that the bus fare would be the same as the trolley fare, 8 cents or two tokens for 15 cents.

Forty-Cent Sunday Pass.—The Pittsburgh Railways, Pittsburgh, Pa., will give a 3 months' trial to a second transferable Sunday pass selling for 40 cents. The pass will be good for unlimited riding by the holder in any and all fare zones on the system excepting the interurban routes, Charleroi, Washington, Donora, Harmony and Butler Short Line. It will not be good in the city of Washington nor on night cars. The installation of the second Sunday pass is an attempt to stimulate riding in the suburban zones. The 25-cent Sunday pass will still be available.

Hearing Set on Cancellation of Bus Privilege.—Hearing on application of the Community Traction Company, Toledo, Ohio, asking for cancellation of the license of the Toledo Motor Bus Company, a competing independent line, has been set for March 13 by the Ohio Public Utilities Commission. The railway alleges that the bus company has violated the state laws. The bus company operates in direct competition with the traction service on Dorr Street. A 5-cent fare is charged by the bus line. Some phases of the case have already been before the commission and testimony of the bus operators showed that a license originally granted to a partnership had been used for several months by the corporation, to which it was transferred.

Seeks Fourth Bus Line Permit.—Application has been made to the City Council of Buffalo by the International Bus Corporation, a subsidiary of the International Railway, for permission to operate a double-deck bus line in Richmond Avenue at a 10-cent fare. This would give the International its fourth bus line in Buffalo. The company asks a 10-year franchise, with the right reserved to the city to purchase the line on April 1, 1928, or any April 1 thereafter on 6 months' notice to the company, at its appraised valuation, the Public Service Commission to be arbiter if there is any dispute. It is agreed no valuation shall be placed upon the franchise.

City Will Take One-Man Car Issue to Supreme Court.—An appeal from the decision of Judge Isaac Wolfe in the Superior Court making permanent the temporary injunction restraining the city from enforcing the ordinance banning one-man double-truck cars of the Connecticut Company, New Haven, Conn., will be entered soon by counsel for the city. The ordinance was passed by the Alderman and if allowed to stand would have prevented the Connecticut Company from operating its double-truck one-man trolley cars on its lines in the city. In his decision making the injunction permanent, Judge Wolfe found nothing in the city charter giving the Aldermen express or implied power to pass such an ordinance. The case will now be carried to the Supreme Court, which will be called upon to review the decision in the Superior Court.

Higher Fare in Effect. — A 7-cent fare on cars of the Chicago, South Bend & Northern Indiana Railway operating in and between South Bend and Mishawaka, Ind., has been put into effect following the authorization by the Public Service Commission. Four tokens will be sold for 25 cents, good on local lines in each city in which the company operates.

Railway Sells Another Service.—The San Diego Electric Railway, San Diego, Cal., has put into effect another novelty. This time it is the selling of newspapers and magazines to riders along the way. The service is in charge of F. A. Jeffres, who will have a staff of 45 men to sell the leading magazines and San Diego papers. The plan will be to cover the morning cars starting from the outer terminals and sell to downtown districts and in the afternoon to sell from the downtown central points to the outer districts. Mr. Jeffres has filed a surety bond to guarantee a faithful performance of contract. The management of the railway reserves the right to approve all newspapers and magazines to be sold.

Learning "How to Hang."—The United Railways, St. Louis, Mo., has posted cards in its cars which read: "When standing in car, take firm hold of strap or seat back. This will enable you to avoid a fall if motorman has to start car suddenly."

Street Guide to Aid Patrons.—A general order has been issued by the Detroit Department of Street Railways, Detroit, Mich., providing that each street car conductor shall carry at all times when on duty a street guide as part of his regular equipment. It is the desire of the department to have the men prepared to furnish complete information to those inquiring as to the location of certain buildings, factories, schools and hospitals as well as street numbers and how to reach them by street car or motor coach. Complaints have been made by strangers in the city that due to the inability of the conductors to answer questions difficulty is experienced in reaching destinations. The order to the conductors instructs them not to answer any questions by saying that they do not know. They are to give the desired information if they can possibly do so, using the street guide when necessary.

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Financial and Corporate

Montreal Financing Explained

Plan Advanced to Give 6 per Cent Bonds for Debenture Stock on Basis of 101

The Montreal Tramways, Montreal, Que., has decided to ask the holders of the 5 per cent debenture stock to exchange this stock for 5 per cent 30-year general and refunding mortgage sinking fund gold bonds. These bonds will be authorized for a total principal amount of $100,000,000, bearing a rate of interest not exceeding a maximum of 6 per cent per annum, and will be issued from time to time. The basis of exchange will be $101 of bonds for each $100 of debenture stock, and it is desired that the exchange be effective as and from April 1, 1925.

At the present time the company has an authorized issue of first and refunding mortgage gold bonds amounting to $75,000,000. Of this issue $21,351,000 are issued and outstanding. It is intended to close this issue at $25,000,000.

The company has an authorized issue of debenture stock amounting to $75,000,000, of which $17,600,000 has been issued and is outstanding. The company desires by means of the proposed exchange to bring about the retirement of all this outstanding debenture stock, and on the completion of the exchange the trust deed securing the debenture stock will be canceled.

Of the new issue of general and refunding mortgage sinking fund gold bonds, a sufficient amount will be held by the trustee to retire an equivalent amount of the first and refunding mortgage bonds as presently issued or as may hereafter be issued up to the total amount of $25,000,000. It is intended that these bonds shall be issued as a series "A" and bear interest at the rate of 5 per cent per annum.

It is further intended that a second series, to be known as series "B" and bearing interest at the rate of 5 per cent per annum, be authorized and issued fully to provide for the proposed exchange of bonds for the outstanding debenture stock of the company. The remaining general and refunding mortgage sinking fund gold bonds are to be issued from time to time for the corporate purposes of the company and proper restrictions will be inserted in the trust deed with respect to such further issues.

The directors feel that the creation of this new security and the retirement of the presently outstanding debenture stock is in the best interests of the debenture stockholder. Further issues of debenture stock do not command a sufficiently wide market to provide for future financing on reasonable terms. The first issue of debenture stock was made at the time of the company's organization in 1911, but since that time small issues have been made. In 1918, $1,000,000 was issued and sold and in 1922 a further amount of $500,000 was disposed of. It is explained that debenture stock is not a security generally known on the Canadian or American markets, and the same is not readily salable on favorable terms. It is obvious that as the activities of the company extend and broaden the company must have available for its purposes a security which will find a ready market throughout the world. It was explained that:

> If the proposed exchange is authorized, the present first and refunding mortgage bonds will be closed at $25,000,000; the debenture stock will disappear as a security of the company, and the holders of such debenture stock will receive an amount of the general and refunding mortgage sinking fund gold bonds which the company proposes to issue with a premium of 1 per cent on the exchange. Bonds of the issue so authorized will provide a means for the retirement at maturity of the first and refunding mortgage bonds maturing in July, 1941, and from that date all holders of bonds of the proposed issue of general and refunding mortgage sinking fund gold bonds will rank *pari passu* in the security provided by the trust deed securing the same.

Abolition of Jitneys Increases Revenue in Houston

Traffic on the railway lines of the Houston Electric Company, Houston, Tex., has increased markedly since jitney competition was abolished some time ago. This fact is disclosed in the report covering the first 6 months of operation without competition from the jitney lines. The six months has brought 4,300,000 more rides with an increase of $187,218 in revenue.

The company published figures to show that for the 6 months' period just ended it failed to make an 8 per cent return on its investment by $122,868. For a similar 6 months of the year 1923 the company failed to make an 8 per cent return on its investment by $278,831. The report shows a decrease in the deficit of $155,968 for the 6 months, or, at this rate, a deficit of $245,000 a year for 1924, as against one of $558,000 for 1923.

"This means," said W. E. Wood, manager, "that the company has been pulled from a concern on the brink of bankruptcy to a point where a fair return on the investment may be expected soon."

Dividends Paid and Property Kept Up

Unfavorable Weather and Adverse Business Conditions Diminish Revenue of Minneapolis Property—$900,000 Spent on Extensions, Reconstruction and Equipment

FOR the year ended Dec. 31, 1924, the Twin City Rapid Transit Company and subsidiary companies operating in Minneapolis and St. Paul, Minn., earned sufficient to pay regular quarterly dividends at the rate of 7 per cent per annum on the preferred stock and two semi-annual dividends of 2 per cent, aggregating 4 per cent, on the common stock.

It is the belief of the management that the decrease in operating revenue during the year was due largely to unfavorable business and weather conditions. The decrease in net income transferred to profit and loss for the year was $301,059.

In his report to the stockholders, Horace Lowry, president, said that as soon as the value of the property was finally fixed and the directors had reasonable assurance about the amount on which the company would be permitted to earn a return, the question would be taken up of putting the common stock on a quarterly dividend basis, the same as it was prior to the year 1918, instead of the semi-annual basis which the directors have been forced to adopt due to unusual conditions. He said that after many months of hearings before the Railroad and Warehouse Commission proceedings to fix the valuation of the property of the Minneapolis Street Railway and St. Paul City Railway were concluded on Dec. 13, 1924.

During the year $958,455 was spent for extensions, reconstruction, paving and equipment. The money for these expenditures was taken from the renewal reserves, but after the value of the property has been finally determined, it will be possible to finance capital expenditures by the issue of capital securities.

The $5,000,000 first consolidated mortgage extended 7 per cent bonds of the Minneapolis Street Railway, due Jan. 15, 1925, have been refunded to Aug. 15, 1928, by the issue of $5,000,000 of Minneapolis Street Railway first mortgage collateral 5½ per cent gold notes, due Aug. 15, 1928. The first consolidated mortgage extended 7 per cent bonds, payment of which has been extended to Aug. 15, 1928, with interest at 5½ per cent per annum after Jan. 15, 1925, were pledged with the trustee to secure the payment of the 5½ per cent gold notes.

The $500,000 first mortgage 5 per cent bonds of the Minneapolis & St. Paul Suburban Railway, secured by one of the suburban lines of that company, payment of which was guaranteed by the Twin City Rapid Transit Company, became due Sept. 1, 1924, and the directors authorized the company to buy these bonds and hold them in its treasury, uncanceled and without satisfying the mortgage securing same, until such time as a comprehensive plan of refinancing could be worked out based upon values to be determined by the Railroad and Warehouse Commission. All of this issue of bonds is now with the treasury of the Twin City Rapid Transit Company.

BUS COMPANY PURCHASED LAST AUGUST

For some years past the Twin City Motor Bus Company has been operating between the business districts of Minneapolis and St. Paul, and early in 1924 the directors decided to acquire this company. This was accomplished and since Aug. 1 the Twin City Rapid Transit Company has owned all of the capital stock of the Twin City Motor

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CONSOLIDATED INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1924	1923
Revenue from transportation	$12,593,798	$13,351,233
Revenue from other railway operation	110,770	111,878
Total railway operating revenue	$12,704,569	$13,463,111
Way and structures	$1,175,455	$1,197,372
Equipment	1,039,108	1,137,028
Power	1,336,670	1,421,156
Conducting transportation	4,308,179	4,514,533
Traffic	46,479	51,021
General and miscellaneous	1,351,255	1,285,422
Transportation for investment—Credit	—71,222	—68,693
Total railway operating expenses	$9,185,927	$9,537,841
Net operating revenue	$3,518,641	$3,925,270
Taxes assignable to railway operation	1,265,982	1,373,068
Operating income	$2,252,659	$2,552,201
Income from unfunded securities and accounts	$53,312	$86,920
Miscellaneous income	37,394	7,085
Net income miscellaneous physical property	10,355	22,928
Total non-operating income	$101,061	$116,935
Gross income	$2,353,721	$2,669,137
Rent for leased roads	$3,000	$3,000
Interest on funded debt	1,072,968	1,087,625
Miscellaneous debits	8,744	8,443
Total deductions from gross income	$1,084,712	$1,099,069
Net income transferred to profit and loss	$1,269,008	$1,570,067

PROFIT AND LOSS ACCOUNT OF THE TWIN CITY RAPID TRANSIT COMPANY

Balance Jan. 1, 1924		$1,774,093
Additions for the year		1,269,009
Net adjustments	$77,063	
Dividends on preferred stock	210,000	
Dividends on common stock	880,000	
Balance carried forward	1,876,038	
	$3,043,101	$3,043,101

company is run separate from the railway but in harmony with that property.

In his report Mr. Lowry referred to the making of a contract with the Light-Weight Noiseless Electric Street Car Company for the construction of 50 street car bodies, which the company had sold in Chicago. Under the terms of this contract, a large amount of the shop overhead items of the company were absorbed which under normal conditions would have been charged to operating expenses, and in addition thereto a net profit was made.

The revenue passengers carried during 1924 totaled 209,202,818, against 221,542,298 in 1923, 226,543,924 in 1922 and 227,727,748 in 1921. During the year recently ended the company operated 491.13 average miles of track, with a gross passenger car revenue of $12,555,513. The income account for the years 1924 and 1923 and the profit and loss account are shown in the accompanying tables.

Gain in 1924 $6,000

For the year ended Dec. 31, 1924, the Tygarts Valley Traction Company, Grafton, W. Va., which operates 7 miles of line at a 7-cent fare, had total earnings of $52,471 and operating expenses of $39,416. This left net earnings of $13,054. After payment of interest on bonds, dividends on preferred stock and deduction of damage reserve, there was a net gain of $6,114. The cash fares for the period ended Dec. 31, 1924, amounted to $45,932 and ticket earnings to $6,305.

Paving and Snow Costs Hit New York Company

The Third Avenue Railway, New York City, did not earn enough to pay 2½ per cent interest on the 5 per cent adjustment bonds for the 6 months' period ended Dec. 31, 1924. Because of the necessity for setting aside money for proper maintenance and depreciation the directors have decided to declare an interest payment of 1½ per cent on these bonds, payable April 1, 1925.

Since the company resumed payment upon its 5 per cent adjustment bonds April 1, 1922, it has paid out in interest practically the entire amount earned during each 6 months' period. During these periods it has been necessary for it to draw upon funds heretofore set aside and the funds for depreciation and contingencies in order to meet the expenditures for capital account made necessary by the purchase of new equipment and to pay the expenses of new paving in existing tracks.

The management explains that to have taken care of these capital expenses by the sale of securities under present conditions would have resulted in a serious sacrifice. The result of this draft upon these funds has been to decrease them very substantially. In addition these funds have been further reduced by reason of the fact that it was necessary during the last year to pay $750,000 in paving bills in litigation decided against the company or compromised. Removal of snow in January cost approximately $100,000. This is in addition to the 12 per cent of its gross receipts, which the company pays in taxes to state and city.

Abandonment in Palo Alto

The Peninsular Railway has definitely decided to abandon its local lines in Palo Alto, Cal. Application for abandonment has been placed on the commission's calendar for hearing. The abandonment, which requires the consent of the Railroad Commission, had been sought in an application filed with that body, but had been withdrawn pending the outcome of negotiations over the transportation situation between the railway and the city of Palo Alto. The further trial of the system under modified conditions, including a time schedule providing for five cars instead of three and a 12-minute schedule instead of a 20-minute one, failed to popularize the service as had been expected. This marks a conclusive stage in the long controversy between the city and the railroad over the local transportation situation. When asked whether the company would substitute bus service for the railway system Mr. Shoup replied that that question would be decided in a few weeks.

Palo Alto is a town of about 6,000 inhabitants. The mileage of the local line of the Peninsular Railway there is small, but the trackage is not segregated in the manuals of reference from the rest of the company's system.

Valuation Bill Withdrawn in Indiana

Representative Charles Mendenhall of the Indiana House of Representatives has withdrawn from that body his bill which proposed to define the fair value or the rate base of a public utility corporation as the last value of the property assessed for tax purposes by the state Board of Tax Commissioners, plus the cash betterments and capital additions made since the time of that assessed valuation. Mr. Mendenhall introduced the bill as a companion measure to his utility bill, which was killed previously.

This bill sought to increase the power of the Public Service Commission in the matter of the regulation of security issues by utility corporations. One of the provisions would have made it unlawful for the commission to authorize a utility to issue securities when the amount of the issue plus outstanding stocks, bonds, notes and other evidences of indebtedness would be in excess of the fair value of the property. The bill which he withdrew was to define fair value as expressed in the first bill. There was no purpose to be served by the second bill since the first measure had been killed.

New Interests Reported in Winnipeg Property

It is understood by the Canadian *Financial Post* that control of the Winnipeg Electric Company, Winnipeg, Man., operating the Winnipeg Electric Railway, has passed to A. J. Nesbitt, president of Nesbitt, Thompson Company, Toronto. While no statement has been issued, it is understood that the large block of common shares of the company that has been in the hands of the Mackenzie-Mann group has been acquired by Mr. Nesbitt and associates, and that these shares, together with the extensive holdings formerly owned by Mr. Nesbitt and his group, give to the Eastern financiers control of the company.

The *Post* says that the move is regarded as highly constructive in two ways; first, in removing from the market the pressure of a large block of overhanging shares that have been a depressing factor since the death of Sir William Mackenzie, and, second, in putting control of the company's affairs in the hands of a successful public utility financier who has given to all of his companies effective and public-spirited leadership.

The Winnipeg Electric Company is offering 2,000 shares of 7 per cent cumulative preferred stock to its customers. The campaign will continue 10 days and will be conducted by the employees, each of whom is to call on ten of his friends during the drive. The stock can be purchased on the partial payment plan—$10 a share with the order and $10 a month a share. This is the first attempt at customer-ownership ever made in Winnipeg on a big scale. The prime purpose of the offering, according to General Manager McLimont, is to secure an increasing measure of customer-ownership and not to secure new capital.

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Negotiations Under Way for Purchase of Rainier Valley Line

While city officials are preparing an appraisal of the Seattle & Rainier Valley Railway, Seattle, Wash., with the view of negotiating for purchase, two factions in Rainier Valley have developed. One is in favor of the purchase of the lines and the other opposes such purchase, on the ground that the company should be made to meet its financial obligations relating to gross earnings tax and delayed paving, before the city takes over the lines.

The company now owes the city approximately $60,000 in delinquent franchise tax and is in arrears in paving between its tracks A suit to force the company to do the paving is pending in the Federal Court. City officials agree that if the city took over the system now it would have to assume the responsibility of paving. The company has persistently given lack of funds as its reason for not living up to its paving clause in the franchise. The franchise tax is 6 years overdue.

The Council recently adopted a resolution instructing Corporation Counsel T. J. L. Kennedy to take immediate steps for collection, but the finance committee has modified this resolution to provide that Mr. Kennedy recommend what steps should be taken.

With the cost of the paving required by the company's franchise estimated at about $1,000,000, the company again takes the position that it cannot raise the money. Gradual increase of population led the company, not long ago, to apply to the Council for the privilege of operating auto-bus feeder lines. The bus-operating privilege was refused.

The combination of circumstances has created a deadlock with the city authorities, the railway and the people of the valley, and the only solution so far suggested is that the city shall take over the system. No purchase price has been discussed as yet.

29,000,000 More Passengers on Chicago Surface Lines

A hands-off policy has been adopted by the Chicago Surface Lines toward the purchase campaign being conducted by the city of Chicago, and while municipal ownership proponents and opponents are debating and demagogues are denouncing, the men doing the detail work in the operation of the system are aggressively pushing improvements and service extensions.

Beginning March 1 75 multiple-unit cars, all new, were put into service on the 19-mile Milwaukee Avenue run. A few were replacements. Most of the new cars went into the formation of 36 two-car trains with a schedule of increased headway and increased service.

A summary of growth for the fiscal year ended Feb. 1 shows 1,492,000,000 rides, an increase of 29,000,000 and a gain of a little more than 1 per cent in revenue passengers. Mileage was increased 4.60 per cent, one of the highest ratings in the country.

Officials announced that the lines would not be permitted to lapse at any time regardless of the purchase campaign. Franchises on which the lines depend have only 2 years to run.

Dividend Raised in Philadelphia —Stock Sale Successful

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has increased the dividend on its common stock from 6 per cent to 8 per cent annually to take care of accumulated dividends. It is explained that in 1907 the company entered into an agreement with the city of Philadelphia under which sinking fund payments are provided which may be used to pay off the $30,000,000 of capital stock at par in 1957 and will no doubt be used for that purpose. Under this agreement holders of the capital stock were to receive 6 per cent per annum cumulative. At present common stock holders are about $20,000,000 short of having received their 6 per cent cumulative dividend. The railway management holds this deficit should be made up before the end of the city-company agreement in 1957 by an added annual dividend payment of 2 per cent. With this in mind $1 will be paid for the quarter commencing Jan. 1, 1925.

Passengers' Attention Was Attracted by Placards

The report of the Philadelphia Rapid Transit Company for the year ended Dec. 31, 1924, shows net income of $1,810,364 after depreciation, charges and taxes, equivalent to $3.01 a share (par $50) earned on $29,996,110 capital stock outstanding, as compared with $1,800,000 or $3 a share in 1923.

Car riders have already oversubscribed the proposed issue of 60,000 shares of 7 per cent cumulative preferred stock offered to them at par. The total of orders handed by passengers to conductors and subway-elevated cashiers was not disclosed, but 13,000 car riders oversubscribed the $3,000,000 offering in six days.

All stock orders except from bona fide patrons who are residents of the city will be rejected. The company will not, it was said, cut down the number of shares ordered by each car rider, the limit of which is ten to each individual. Applications will be filled in the order in which they are received, officials said.

There can be no delivery until the issue of $3,000.000 preferred stock has been authorized by the City Council and by the stockholders, who will meet on March 18. The city's assent to this issue is now being urged to accentuate this end.

Utilities Borrow on Better Terms —Marked Improvement by Rails

Public utilities issued in excess of $1,000,000,000, par value, of securities in 1924 at an average yield per dollar of 6.03 per cent and an average yield per issue of 6.14 per cent on offering price. With very few exceptions all classes of utilities borrowed capital at materially lower rates in 1924 than they did in 1923.

These facts are based on an analysis of public utility financing in 1924 by H. B. Dorau of the Institute for Research in Land Economics and Public Utilities. The study which was made further shows that average rates were materially lower in the last quarter of the year than in the first 9 months. During the first, second and third quarters of 1924 the average yield per dollar was 6.08, 6.10 and 6.14 per cent, while in the fourth quarter the average yield per dollar on new issues fell to 5.81 per cent. The simple average rates also show marked declines from averages of 6.20, 6.23 and 6.16 in the first, second and third quarters of the year, to 5.96 per cent in the fourth quarter. During the last quarter of the year a number of large issues were offered at prices to yield as low as 5 per cent—a rate only occasionally approached at any time since the years 1919 and 1920, when the yields on public utility securities were at their height.

Electric railway securities were issued to yield the highest weighted average rate of any utility class (6 per cent). The simple average yield is below the average for all utilities, but this is accounted for by the number of comparatively small issues of notes and equipment certificates at materially lower rates. The averages on electric railway bonds are more representative for this utility, being 6.25 and 6.22 per cent for weighted and simple averages respectively. This is a marked improvement over 1923, for which year similar calculations show the weighted average rate on bonds issued by electric railways to have been 6.52 per cent and the simple average rate 6.37 per cent.

Electric railway companies rendering other utility services also borrowed capital at decidedly lower average rates in 1924. The weighted and simple average rates on new bonds of this class of utilities in 1923 were 6.25 and 6.36 per cent, while in 1924 comparable average rates were 6.11 and 6.16 per cent.

New Directors for Eastern Massachusetts. — Charles E. Ober, J. Wells Farley, K. Otis Wardwell and Elliott Spaulding were elected directors of the Eastern Massachusetts Street Railway, Boston, Mass., at the annual meeting of stockholders. Other directors were re-elected. The number of directors was increased from seven to nine.

Net Income Lower.—The total operating revenue of the Department of Street Railways, Detroit, Mich., for January, 1925, was $1,867,256, against $1,973,453 for a similar month a year ago. These figures included $1,811,735 and $1,926,419 for transportation revenue, in January, 1925, and 1924 re-

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spectively. The operating expenses were $1,354,260 in January, 1925, and $1,423,186 in January, 1924. Net revenue was $550,267 in January, 1924, and $512,996 in January, 1925. The gross income for January, 1925, and January, 1924, was $469,497 and $492,353, respectively. Net income fell from $89,023 in January, 1924, to $56,329 in January, 1925. Total passengers carried decreased from 41,451,043 in January, 1924, to 39,889,805 in January, 1925.

Northern Ohio Issues Authorized.—The State Public Utilities Commission of Ohio has authorized the Northern Ohio Traction & Light Company, Akron, to issue $7,000,000 in bonds and notes to reimburse the treasury for capital expenditures. The issue is to be divided as follows: $2,500,000 first lien and refunding 5 per cent bonds, $2,500,000 bonds bearing 6 per cent interest due in 1947, and $2,000,000 in two-year 6 per cent notes, dated Feb. 1, 1925. The common stock of this company is owned by the Northern Ohio Electric Corporation, the financial structure of which is being readjusted.

Reorganization Must Provide for Mill Tax. — The city of St. Louis, through counsel, has notified the Federal court that the municipality will oppose any plan for the reorganization of the United Railways which does not provide for the payment in full of mill tax judgments of $2,326,321. Notice to this effect was given when a motion was filed by the city on Feb. 20 to intervene in a request to deny Receiver Wells' application for the court's approval to take up $4,200,000 general 4 per cent bonds of the St. Louis Transit Company. The city complained that the reorganization plans do not provide for the payment of the back mill taxes.

Net Income Lower. — For the 7 months' period ended Jan. 31, 1925, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., was $6,625,686, against $6,854,569 for the period ended Jan. 31, 1924. Operating expenses, including taxes, increased from $5,648,858 in the 7 months' period ended January, 1924, to $5,762,400. The net corporate income fell off to $819,107 in the 7 months' period ended Jan. 31, 1925. For the similar period of last year the net corporate income was $1,143,871.

Park Tax Paid.—A check for $289,877 has been sent to the city of Baltimore, Md., by the United Railways & Electric Company, which is the park tax for the quarter ended Dec. 31, 1924. This park tax paid by the railway is 9 per cent of the gross receipts from lines within the city limits. It is paid in lieu of all other local taxes.

Will Abandon Service in City.—The Toledo & Western Railroad has been granted permission to abandon service within the city of Toledo, Ohio, and on March 21 plans to stop its passenger cars at Stop 4 in West Toledo. The company claimed it had been losing money on city operation. Recently it was forced to abandon part of its track within the city limits due to changes in street paving. No provision has been made for a connecting service other than that furnished by the Community Traction Company.

One Mile Abandoned. — The Public Service Commission recently granted to the Hornell Traction Company, Hornell, N. Y., permission to abandon the North Hornell line, extending to Hornellsville, a distance of 1.12 miles. The approval is on condition that the company remove all its structures from any streets in the city of Hornell on which the line is operated and restore the streets to good condition. The evidence showed that receipts of the North Hornell line averaged from $2 to $4 a day, and that the cost of operating was $12 a day.

Common Dividend Cut by Boston Elevated. — Directors of the Boston Elevated Railway, Boston, Mass., have declared a quarterly dividend of 1¼ per cent on the common stock. In the previous quarter 1½ per cent was paid.

Reorganization Move Made. — The Cleveland Trust Company, Cleveland, Ohio, as trustee, has filed suit in Federal court against the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., in which it seeks to foreclose property of the defendant in Indiana. A mortgage of $6,000,000 was made in 1907, securing money used in providing the lines. The trust company also asks that the court hold the mortgage valid; that it order an account of all property subject to the mortgage; that a receiver be appointed, and that an injunction be issued restraining the defendant corporation from interfering with or disposing of the property of the company. This action is understood to be one of a series of formal moves to be made in order to carry out the plans for the reorganization reviewed in the ELECTRIC RAILWAY JOURNAL for Feb. 7, page 238.

Promising Year Ahead.—The Connecticut Company, New Haven, Conn., which has not paid a dividend since 1916, shows encouraging returns for 1924. The past year is the fourth in succession in which fixed charges have been covered with a fair surplus. Maintenance charges have been unusually heavy because earnings have been put back into property liberally.

Illinois Power Gets Additional Roads.—The Illinois Commerce Commission has authorized the Illinois Power & Light Corporation to acquire all of the outstanding stock of the St. Louis, Troy & Eastern Railway, a 26-mile steam line, and the St. Louis & Illinois Belt Railway for $2,030,000, of which $1,700,000 will be paid in cash.

Customer-Ownership Plan Successful.—In the customer-ownership campaign ended Jan. 31, the Public Service Corporation, Newark, N. J., sold 77,572 shares of 7 per cent cumulative preferred stock to 19,545 subscribers throughout New Jersey. It was the most successful of the six campaigns since 1921. Since this method of selling securities was started the company has sold to customers approximately 260,000 shares of 7 per cent and 8 per cent cumulative preferred stock.

Operation Will Cease.—Notices have just been posted that the Gates Mill line of the Cleveland & Eastern Traction Company, Cleveland, Ohio, will cease operation. The company received permission from the State Public Utilities Commission to abandon service on account of heavy losses from month to month, extending over more than a year. Operators of the line, however, have been postponing the day of abandonment, in the hope that some way would be found to make the line pay. The principal towns affected are Gates Mill, Middlefield, Chardon and Burton.

District Merger Bill Passed.—The House has passed the Senate bill authorizing a voluntary consolidation of the electric railway companies in the District of Columbia. The measure sent to the President provides, however, that no actual amalgamation shall be made until its terms have been ratified by Congress. The bill was passed under suspension of the rules. It is said that "as soon as the merger bill becomes law Congress expects the Public Utilities Commission to bring the Washington Railway & Electric and the Capital Traction Company officials together to work out a plan of consolidation to be submitted to the next Congress for approval."

Tax Valuation in Ohio Higher.—The total 1924 valuation upon which the public utility industry in Ohio will pay taxes in 1925 is $1,484,450,600, compared with $1,408,728,070 a year ago. In 1910 the tax valuations of the electric railways was $32,693,904; in 1923, $185,873,530, and in 1924, $183,440,700.

Deficit for Seven Months' Period.—The statement of the Interborough Rapid Transit Company, New York, N. Y., for the 7 months ended Jan. 31, 1925 shows an increase of $630,944 in total revenue over the similar period ended Jan. 31, 1924. This gain was more than offset, however, by higher taxes and the increase in the Manhattan (elevated) rental effective on July 1, 1924, under the readjustment plan. Though the company was able to lower operating expenses during this period, the reduction was insufficient to escape a deficit after allowing for all charges. This deficit was $136,302, which represented an increase of $1,211,025 over the corresponding 7 months in 1924.

Another Payment on Seattle Debt.—The city of Seattle, Wash., paid another installment recently on the purchase price of the Seattle Municipal Railway, including $833,000 on the principal and $312,525 on the interest. This makes a total of $7,582,100 interest and principal paid on the agreed purchase price. The city still owes $11,688,000 of the $15,000,000 debt incurred.

Collateral Notes Offered.—Blodget & Company, New York; W. W. Armstrong Company and the First Wisconsin Company are offering at 98 and interest to yield more than 6.20 per cent $1,530,000 of 15-year 6 per cent collateral gold notes of the Western United Corporation. The notes are dated Jan. 1, 1925, and are due Jan. 1, 1940. The Western United Corporation on Jan. 1, 1924, acquired ownership of the Aurora, Elgin & Fox River Electric Company, which operates the 30 miles of street railway in Elgin and Aurora, with a population of more than 80,000; also 36 miles of interurban lines serving the Fox River Valley, connecting Aurora and Elgin. The interurban line offers the only direct passenger service between Aurora and Elgin.

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Legal Notes

CALIFORNIA.—*Slackening of Speed Not an Invitation to Alight.*

Where a street car slackens its speed when rounding a curve and approaching a stopping place, an intending passenger should not consider this an invitation to alight from the car, and it was not in itself negligent for the motorman to increase the speed at such a time. (Hildebrand vs. City and County of San Francisco, 231 Pacific Rep., 1008.)

FEDERAL COURT—*Character of Business Determines Common Carrier Conditions.*

A state cannot fetter an interstate carrier by the imposition of unreasonable burdens. A common carrier must serve all, up to the capacity of his facilities, without discrimination and for reasonable pay. Where a motor truck operator had only three customers, made no effort to solicit public business, had no power of eminent domain or franchise and made no greater use of the highways than any other member of the body politic, he was not a public carrier. [Michigan Public Utilities Commission et al. vs. Duke, 45 Supreme Court Rep., 191.]

GEORGIA.—*Stop at Flag Station.*

A motorman made a stop at night on signal at a flag station, but stopped about 50 ft. beyond the station. The signaling passenger, walking down the track to board the car, fell into an underpass. The company was held responsible. (Atlanta Northern Railway vs. Brown, 125 Southeast Rep., 465.)

IOWA.—*Rail Higher than Pavement.*

The elevation of street railway tracks 1 in. or 1½ in. above the pavement does not in itself constitute negligence or present an issue for the jury. (McClosky vs. Iowa Railway & Light Co., 200 Southwest Rep., 913.)

KENTUCKY—*Injury at Turnstile.*

At a loading station a railway company had a series of turnstiles, through which intending passengers passed before reaching the boarding platform. The turnstiles were kept locked, but were released when passengers paid their fares to an operator. The court held that the company had the right to maintain this system of collecting fares and that the operator could keep turnstile locked until he was reasonably satisfied the fare had been paid. Hence, when the operator claimed a fare had dropped on the floor and a woman passenger nevertheless pushed against the turnstile with such force as to injure herself, she was guilty of contributory negligence. [South Covington & C. Ry. vs. Elder, 266 Southwest Rep., 1088.]

MASSACHUSETTS.—*Alighting Passenger Injured by Crowd Attempting to Board Car.*

Where a company should reasonably have expected that a crowd would attempt to board a car and be likely to act in a manner dangerous to other passengers, it should take means to protect them, but the mere knowledge that a crowd would be present at a certain time and place and there was no showing of previous violent misconduct by such crowds, the company is not liable to injuries to an alighting passenger. (Dullea vs. Boston Elevated Railway, 146 Northeast Rep., 237.)

MISSISSIPPI. — *Uninsulated Wire in Trees Near School.*

It is negligent for a company to place an uninsulated feed wire in the branches of trees adjoining a public school playground, where such trees are of such nature as to attract children to climb them. (Laurel Light & Ry. Co. vs. Jones, 102 Southern Rep., 1.)

MISSOURI—*Wife's Negligence as Husband's Chauffeur Chargeable to Him.*

A wife, acting as her husband's chauffeur in taking him in his automobile to a business appointment, was his servant, and her negligence, contributing to his injury, was chargeable to him. [Rose vs. Wells, 266 Southwest Rep., 1015.]

NEW JERSEY—*Injury from Center Door.*

A passenger entering a car at a station was injured when the center door of the car prematurely closed. There was evidence that an unauthorized person had pushed the button permitting the door to close. The trial court ruling in refusing to direct a verdict for the defendant and submitting the case to the jury was upheld. [McPherson vs. Hudson & M. R.R., 127 Atlantic Rep., 23.]

NEW YORK.—*Right of Way at Crossings.*

Priority in time of reaching an intersection of streets is only one of the elements which should be considered in determining the care to be exercised by a motorman in proceeding across a crossing. (Geyer vs. International Railway, 206 N. Y. Sup., 715.)

OHIO.—*Denial of Rehearing by Commission Without Taking Evidence Not Unreasonable — Control of Buses by Commission Constitutional.*

The Public Utilities Commission issued a certificate of public convenience and necessity to a motor bus operator, according to law. Another common carrier filed a complaint, alleging misstatements had been made in the affidavit of the motor bus operator, upon which this certificate was based, but not controverting any of the material statements set forth in the affidavit. The commission overruled the complaint and denied a hearing, without taking evidence on the question of facts raised in the complaint, and its action was upheld. The statute requiring the commission to issue a certificate of public convenience and necessity to bus operators, who were in good faith operating on the date of the filing of the act with the Secretary of State, is a valid constitutional enactment. (Cincinnati Traction Co. vs. Public Utilities Commission of Ohio et al., 146 Northeast Rep., 84.)

PENNSYLVANIA. — *Public Service Commission Cannot Annul Improvident Contract Unless It Affects Adversely the Welfare of Public.*

A street railway company agreed with a railroad company to pay half the expense of watchmen at their crossings, in case it should become necessary later to maintain such watchmen. Without knowledge of this agreement, the Public Service Commission directed the railroad company to provide these watchmen. The court held that the right to annul a contract can be exercised only under the police power of the state, and unless it appears that a contract in some way adversely affects the welfare of the public, the Legislature cannot interfere. (Director General of Railroads vs. West Penn Rys., 126 Atlantic Rep., 767.)

TEXAS.—*"Proper Lookout" Defined.*

The law imposes on the motorman of a street car the duty to keep such a lookout for persons who might be on or near the track as an ordinary person engaged in a like or similar capacity would keep. Where the sole act of negligence of a motorman relied upon for a recovery is his failure to keep such a proper lookout, the charge of the court to the jury should explain what constitutes such a lookout. (Northern Texas Traction Co. vs. Jenkins, 266 Southwest Rep., 175.)

WASHINGTON.—*Advertisement of Intoxicating Liquors.*

A contract for advertising brewery products, which provided for cancellation when prohibition laws went into effect, was effectually cancelled on the enactment of the laws and the adoption of the constitutional amendment in December, 1914, notwithstanding such legislation was not to be enforced until January, 1916. (Street Railways Advertising Co. vs. Olympia Brewery Co., 230 Pacific Rep., 405.)

WISCONSIN.—*Street Railway Is "Railroad" Within Statute Requiring Junior Railroads to Bear Costs of Crossing.*

A Wisconsin statute requires, when one railroad desires to cross another at grade, that the cost of installation and maintenance of the crossing must be borne by the junior railroad. Under this law the Wisconsin Railroad Commission required an electric railway to pay the entire cost of construction of a crossing of two steam railroads and 75 per cent of its maintenance, the other 25 per cent being apportioned to each of the steam railroads, the theory being that this cost of maintenance placed upon the steam railroads would be the same as the cost of maintenance of that section of track had no street car lines been built over the crossing. The electric railway company appealed, but the commission's decision was upheld by the Supreme Court. (Wisconsin Public Service Co. et al. vs. Railroad Commission et al., 201 Northwest Rep., 977.)

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Personal Items

E. S. Fitz Succeeds B. T. Longino at Beaumont

E. S. Fitz has replaced B. T. Longino as general superintendent of the Eastern Texas Electric Company, Beaumont, Tex., who resigned to enter business for himself in Florida. Mr. Fitz's actual business connections began with Stone & Webster in 1911, with the Blackstone Gas & Electric Company of Pawtucket, R. I., where he was employed 2 years as a student in the meter department. He stayed with the company until 1917. In that year he entered the U. S. Army air service. Following his return from abroad he went to the Houghton Electric Light Company and Houghton County Traction Company, Houghton, Mich., as electrical engineer. He remained with this property until 1923.

From the Houghton County property he was transferred to the Betterment Division of Stone & Webster, where he gained an even wider experience in the public utility field. During this connection a few months of this time were spent in Jamaica, W. I., making a study of power units. Six months were spent in Terre Haute, Ind., and two months in Boston doing preliminary work on the starting of new power stations. Mr. Fitz was graduated as an electrical engineer from Brown University, Providence, R. I. His electrical education began while in high school and continued in his spare time and during the summer preceding his final year at Brown when he accepted assignment for Stone & Webster.

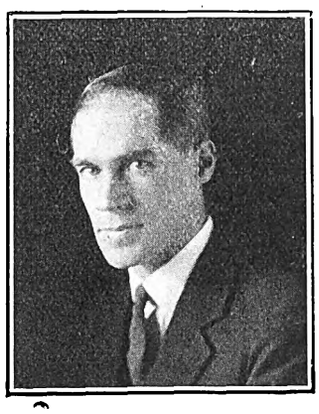
W. H. Goodenough has recently been advanced from the position of master mechanic of the Ohio Public Service Company, Mansfield, Ohio, to that of general superintendent. In this capacity he succeeds H. A. Cowgill. In 1918 he had been transferred from Toledo to Mansfield as master mechanic. In Toledo he had held various positions in the mechanical department of the company since 1910.

H. A. Cowgill, formerly general superintendent of the Ohio Public Service Company, Mansfield, Ohio, has gone to Port Clinton as vice-president and general manager of the Northwestern Ohio Railway & Power Company. This property came under control of Henry L. Doherty & Company last summer and is now part of the Ohio Public Service group through a purchase from the General Gas & Electric Corporation. Mr. Cowgill was superintendent at Mansfield for 6 years.

W. H. McIntyre general manager of the Ottawa Car Works, Ottawa, Canada, has been elected vice-president of that concern in succession to the late W. Y. Soper. Mr. McIntyre entered business in 1891 with the old Standard Electric Company and has worked himself up from the ranks in both the Ottawa Electric and Ottawa Gas Companies, until in 1918 he became assistant general manager of both companies. In 1920 he was appointed assistant general manager of the Ottawa Car Works, later being made general manager, and then being promoted to his present position. In addition to his work with the Ottawa Car Company, Mr. McIntyre is vice-president of the Auditorium, Ltd., vice-president of the Ottawa Artificial Ice Company, president of the Ottawa Auto Dealers' Association, and a director of the Ottawa Motor Club.

Alex. M. Lindsay, Montreal Official, Had Wide Experience

Alex. M. Lindsay, whose appointment as superintendent of rolling stock of the Montreal Tramways, Montreal, Que., was referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 21, 1925, entered the service of the Montreal Tramways in the summer of 1908. From that time until 1912 he was assistant to D. E. Blair, superintendent of rolling stock, who was recently promoted to be general superintendent.



A. M. Lindsay

Mr. Lindsay was born in Waimate, N. Z., in 1883. He was educated at the public and high schools and served part of his apprenticeship in mechanical engineering at Southland Engineering Works, Invercargill, N. Z. His time was completed at John Brown & Company's works at Clydebank, Scotland. Here he worked on the first large turbine installation on the *Carmania* and *Mauretania*. He spent some time at sea and went to Canada in 1905. His electrical education was started immediately and 4 years later he was graduated at McGill University.

In the year 1912, after he had served under Mr. Blair, he was chief inspector at the Canadian Steel Foundries on trackwork and general railway equipment. For the next 3 years he was general manager of the Record Foundry & Machine Company in the shell department in Moncton, N. B. His next post was factory manager of the National Acme Company, Montreal. His last affiliation, extending from 1923 to 1924, before his return to the Montreal Tramways, was with the J. T. Donald Company, Montreal, in charge of the inspection department.

The promotions of Messrs. Thornton and Blair were also referred to in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 21.

Change in Titles at Pittsburgh

F. R. Phillips, mechanical and electrical engineer of the Pittsburgh Railways, Pittsburgh, Pa., has been appointed general manager in charge of maintenance and operation, effective March 1. W. T. Rossell, superintendent, has been appointed general superintendent in charge of maintenance. Their headquarters will be at the central office building, Pittsburgh. Oscar Williams has been appointed superintendent of way, with headquarters at the Manchester office.

C. W. Gifford, vice-president, general manager and purchasing agent of the Plymouth & Brockton Street Railway, Brockton, Mass., resigned to become general superintendent of the Gary, Street Railway, Gary, Ind. Mr. Gifford started with the Bay State Street Railway in 1910 as a conductor. He then served as night foreman, dispatcher, day foreman and traveling inspector. Later he worked as efficiency and service man under Hiram Sparks, transportation manager. In 1919 he was appointed general manager of the Plymouth & Brockton Street Railway. In July, 1923, he was made vice-president of the property. The railway at Gary with which Mr. Gifford will become identified operates 29 miles of track in Gary, Hammond and East Chicago, Ind.

A. W. Baker has been appointed assistant to G. C. Hecker, special engineer of the American Electric Railway Association. The need for an assistant to Mr. Hecker with the qualifications possessed by Mr. Baker has long been apparent. In his new work Mr. Baker will relieve Mr. Hecker of a considerable amount of detail. Among other things, Mr. Baker will take charge of the question box department run monthly in *Aera*, will edit parts of the engineering manual of the association and will assist at committee meetings. For all of this work Mr. Baker, although a very young man, is well qualified. He has behind him the recommendation of the head of the English department of the Polytechnic Institute of Brooklyn and has a short but adequate experience in the application of engineering knowledge which followed his work at the Brooklyn college, from which he was graduated in June, 1924, with the degree of electrical engineer. Before he was graduated from the Polytechnic Institute but after he was graduated from the scientific course of the Brooklyn High School Mr. Baker was connected with the research department of the Western Electric Company. After he was graduated from college Mr. Baker enrolled in the student course of the Westinghouse company at East Pittsburgh. There he assisted in the locomotive erecting plant and in the railway section of the engineering department.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Standard Contract Form Adopted for Engineering Construction

A standard form of contract for suggested use in engineering construction was agreed upon by the Joint Conference on Standard Construction Contracts held in New York on Feb. 25. Copies will be issued to the organizations composing the conference and to allied associations within a few weeks.

Owing to the varying conditions necessarily involved in work in the engineering field, it is not expected that it will always be possible to use the standard contract without changes, but the idea in drafting this document has been to embody certain fundamental principles, based upon the best existing practice and the ideal toward which the professions involved and the contractors are aiming.

Representatives of the joint conference at the New York session met with legal representatives of the American Arbitration Society and of the Chamber of Commerce of New York State to redraft the suggested arbitration clause. This was the only point that had remained undecided after a previous conference in Washington, when the building construction standard contract form was adopted and material progress on the engineering contract was made. As redrafted, the arbitration clause lays down a recommended practice as to arbitration procedure.

It is expected that organizations interested will from time to time propose modifications of the engineering standard contract, the understanding being that the document as it stands now is subject to future revision.

Another Big Garage for Boston Elevated

One of the largest unobstructed floor spaces for garage purposes in the New England States, if not east of the Mississippi, is at the new Forest Hills garage of the Boston Elevated Railway, Boston, Mass. There is space for 42 buses. This garage, with future additions for growth, will take care of the buses in the southern portion of the city. In order to take care of the buses in Somerville and Medford it is planned to build a similar unit at Salem Street, Medford.

The dimensions of the Forest Hills building are 151 ft. x 125 ft., 14 ft. 6 in. high from the floor to the under side of the trusses, with the trusses 15 ft. high at the center of the building. The roof trusses have a span of 150 ft.

A two-story portion comprises stock room, welding room, wash and locker rooms, adjoining the garage, 22 ft. by 103 ft. in area and 18 ft. in height. Driveways are provided so that the operation is carried on in a definite direction by means of large entrance and side doors. The buses are stored across the garage, between the doors, ready at all times for service. In order to eliminate danger from fire provision is made by an island in the driveway for the proper filling of gasoline for the buses, rather than inside the building.

The building is of fireproof construction throughout, with facilities for light repairs and inspection, proper washing and filling of buses. There are proper washing and toilet facilities as well as shower baths and a smoking room.

American Brake Shoe & Foundry Extends Operations

The annual report of the American Brake Shoe & Foundry Company, New York, issued on March 1, recites the purchase by the company during 1924 of the National Car Wheel Company, which has since been consolidated with the Southern Car Wheel Company under the name of the latter corporation as one of the subsidiaries of the American Brake Shoe & Foundry Company. Another subsidiary, the Ramapo Ajax Company, has acquired the plants of the Eliot Frog & Crossing Company at St. Louis and Pueblo. The patent rights, tools and machinery of the Pittsburgh Brake Shoe Company were also purchased during 1924 to aid the company in the development of a composite brake shoe. Experimental work with this shoe is being conducted.

Business fell off between May and October last year, but beginning with the latter month there was a distinct increase in sales. The net profits of the company for 1924 were $2,454,904. These compare with $2,727,097 reported in 1923. After reserves for dividends of subsidiary companies and preferred dividends, the company reported a balance equal to $11.46 a share earned on the 154,918 shares of no par value common stock, against $13.35 in 1923.

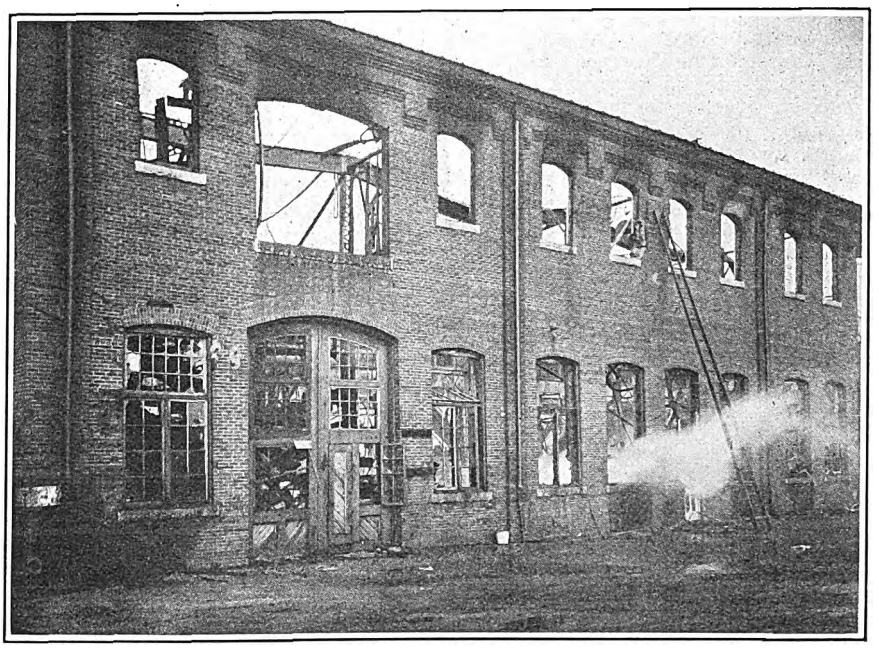
The consolidated statement of earnings for 1924 and 1923 follows:

	1924	1923
*Net income	$2,454,904	$2,727,097
Subsidiary companies' dividends	11,617	113
Preferred dividends	667,695	667,694
Common dividends	789,598	792,083
Surplus	$985,994	$1,267,207

*After depreciation and estimated Federal taxes.

Burned Long Island Railroad Shop to Be Rebuilt

Plans are under way for the construction of new buildings to replace those destroyed in a fire of unknown origin which started in the pipe fitting department of the Long Island Railroad's shop at Morris Park, L. I., early on March 2. It spread to adjacent departments, which include the section used for the repair of air brakes, the tin shop, wood mill, upholstering shop, cabinet shop, dipping room, wheel shop, armature room and department of electrical repairs. In the buildings destroyed repairs to the electrical equipment were carried out. The estimated loss in machinery and equipment is $500,000. The truck overhauling shop, inspection shop for electric rolling stock and the paint shop were not damaged. No rolling stock was burned.



All That Remained of the Long Island Railroad Shops After the Fire

In order to carry on the work of the departments which were destroyed, a section of the paint shop has been cleared out and equipment is being installed to take care of all the bench work. A section of the shop of the

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Columbia Machine Works has been taken over by the railroad and the company's men will carry out armature winding, coil winding and repairs to electrical equipment there.

The new buildings will include a modern layout with solid concrete building. The latest type of equipment for repairing rolling stock will be installed in the new building.

Metal, Coal and Material Prices

Metals—New York	March 3, 1925
Copper, electrolytic, cents per lb.	14.60
Copper wire base, cents per lb.	16.75
Lead, cents per lb.	8.975
Zinc, cents per lb.	7.75
Tin, Straits, cents per lb.	55.30
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	2.05
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$7.00
Weatherproof wire base, N.Y., cents per lb.	19.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1272
Turpentine (bbl. lots), N.Y., per gal.	0.94

Money Needed for Construction

According to John Griffith, superintendent of public works, reconstruction of the Eureka Municipal Railway, Eureka, Cal., will have to be stopped unless a bond issue is authorized. All the rails that have been purchased with the proceeds of the last bond issue have not been laid, there are no new rails available for J Street, because at first there had been no inkling that J Street was to be paved, and with the laying of high T-rails on E Street and A Street the ability of the company to proceed further without more money will be exhausted. Another bond issue must be ready to provide money with which to complete the last 2½ miles of rails, purchased under the $100,000 bond issue voted by the people more than a year ago. From the $100,000 appropriation approximately $65,000 was spent for rails and other materials, leaving $35,000 with which to perform the repairs. Of this latter sum only $15,000 now remains. The calling of a second bond election for the purpose of raising the $50,000 or $60,000 necessary has been suggested.

American and German Manufacturers to Co-operate

The Westinghouse and the Siemens & Halske electrical interests have entered into a 10-year "patent, experience and practice" agreement whereby the American and German concerns will benefit mutually from the research, inventive genius and electrical methods of each other.

Rolling Stock

Los Angeles Railway, Los Angeles, Cal., is working on changes in motor equipment in a number of types of cars. The installation of four motors in place of the original two motors on the first 75 multiple-unit type cars is practically completed. These cars will then be interchangeable for train service with the other cars of types H and K of the company, of which the company has now 326. Sixteen type F multiple-unit cars are now going through the shops for changes in brake equipment. They are being changed from outside to inside hung type brakes and are having the motor armatures dipped and baked. Although these cars have four motors, they usually are operated independent of the other four-motor cars due to a different motor capacity. The first of 82 type B cars to be changed from two-motor to four-motor equipment is now in the shop.

Duluth Street Railway, Duluth, Minn., has announced specifications on five new cars. The details follow:

Date order was placed	September, 1924
Date of delivery	February, 1925
Builder of car body	Light Weight Noiseless Electric Street Car Company
Type of car	One-man, double-truck passenger
Seating capacity	43
Total weight	22,000 to 24,000 lb.
Bolster centers, length	17 ft. 6 in.
Length over all	35 ft. 10¼ in.
Truck wheelbase	4 ft. 6 in.
Width over all	9 ft. 0 in.
Height, rail to trolley base	10 ft. 5¼ in.
Body	Steel
Interior trim	Philippine mahogany
Headlining	Agasote
Roof	Arch
Air brakes	General Electric CP-25
Armature bearings	Ball
Axles	Center bored
Bumpers	Oak with steel plate
Car signal system	Electric
Car trimmings	Bronze
Control	General Electric K-28
Destination signs	Hunter
Door operating mechanism	Air
Fare boxes	Cleveland
Wheelguards	Local standard
Heaters	Electric
Headlights	Golden Glow
Journal bearings	Hyatt roller
Motors	Four General Electric 258, inside hung
Sash fixtures	Twin City
Seats	Cross and longitudinal
Seating material	Rattan—spring cushion
Springs	Combination coil and elliptic
Step treads	Twin City
Trolley catchers	Knutson No. 5
Trucks	W. J. Smith No. 12
Wheels	26-in. rolled steel
Special devices	Simplex safety system

Lake Superior District Power Company, Ashland, Wis., plans to purchase one new car.

York Utilities Company, Sanford, Me., has ordered two new buses for use between Sanford and Biddeford when the commission authorizes such service.

Track and Line

Lake Superior District Power Company, Ashland, Wis., plans to spend approximately $25,000 on track and other improvements at Hurley, Wis., and Ironwood, Mich.

Wisconsin Public Service Corporation, Green Bay, Wis., plans to spend $100,000 improving its city property and $6,000 on its interurban property.

City of Ashtabula, Division of Street Railways, Ashtabula, Ohio, has plans under way for an extension of its line into the Bunker Hill residence section, a suburb. Material has been purchased for the new line and work will be started as soon as the supplies arrive.

Pacific Electric Railway, Los Angeles, Cal., plans to spend some $10,500,000 for new equipment and development in southern California during 1925.

Shops and Buildings

New York, N. Y.—The Board of Transportation recommended recently to the Board of Estimate and Apportionment the award of the contract for the construction of the foundations for the main repair shops of the Brooklyn-Manhattan Transit Corporation at the Coney Island yards to John H. Duncan, Inc. The bid price was $534,702. It was the lowest of seventeen bids received on Feb. 13.

Trade Notes

Carl P. Nachod has been awarded by the Franklin Institute of Philadelphia, Pa., through its committee on science and the arts, its Edward Longstreth medal for ingenuity, novelty of design and general excellence of construction as embodied in his system of signals for electric railways.

Morton Manufacturing Company, Chicago, Ill., announces the appointment of the Crowe-Matthews Company, with offices at 212 Douglas Building, Seattle, Wash., and 1177 Dock Street, Tacoma, Wash., as its exclusive and direct representative covering the sale of its Acme line of railway appliances in the Northwest.

Okonite Company, Passaic, N. J., manufacturer of insulated wires and cables, has opened a sales office in St. Louis at 444 Frisco Building, with L. R. Mann in charge.

Gibb Welding Machine Company, Bay City, Mich., successor to the Gibb Instrument Company, manufacturer of electric welding equipment, announces the appointment of the Welding Service & Sales Company, Donovan Building, Detroit, T. M. Butler, manager, as agent in the Detroit territory for its arc, spot and seam welding machines.

Michigan Electric Railway, Jackson, Mich., has ordered Economy meters with inspection dials to equip all of its cars. This includes freight and passenger interurban equipment and also the city cars in Jackson, Lansing, Kalamazoo and Battle Creek.

New Advertising Literature

Vielé, Blackwell & Buck, New York, N. Y., United States representative of Mannesmann Röhren-Werke, has issued bulletin No. 12 on "Weldless Steel Poles." The pamphlet lists 15 advantages of Mannesmann steel poles.

Irving Iron Works Company, Long Island City, N. Y., has issued a catalog 4A-166 on open steel flooring.

Wagner Electric Corporation, St. Louis, Mo., has issued Bulletin No. 143 describing Wagner fans and to sell them.

Nichols-Lintern Company, Cleveland, Ohio, has issued "Ventilator Tests," a 28-page pocket size booklet which describes N-L bus and railway ventilators by illustrations and dimensional drawings, together with actual service tests of the exhaust capacity of each type ventilator at various speeds.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, March 14, 1925 *Number* 11

An Analysis of the St. Louis Situation

ATTENTION was recently focused on existing conditions in the St. Louis transportation situation as a result of the statement made at the Midyear Meeting of the American Electric Railway Association last month by Col. A. T. Perkins, general manager for the receiver of the United Railways of St. Louis. This was to the effect that destructive competition was being carried on by the bus company which has for the past 2 years been doing business in that city, largely along the streets on which the railway operates. He stated specifically that a bus manufacturer started a competing bus service with the result, if not the purpose, of giving that service a big nuisance value.

The matter appeared to be of such importance that the editors of this paper and *Bus Transportation* determined to see first-hand the actual conditions and to present them to the industry. The article on the subject in this week's issue is an unbiased analysis of the present situation in St. Louis and of the events that have led up to it.

The additional service as given by the competing buses does not appear to be a necessary addition to the transportation facilities, or essential to the welfare of the public. The street cars have capacity to provide better than a seat per passenger in the normal hours, and have sufficient capacity to handle all passengers in the rush. The buses merely duplicate the car service except in the outlying districts. There does not appear to be anything peculiar about these districts that would justify exclusive individual routes through to the center of the city. Whatever advantages there might be in the bus service are nullified by the fact that by using the car line streets the buses are causing added congestion and delays to traffic in the heart of the business district. With unified control, buses may well be used in St. Louis to give a different type of service from that furnished by street cars. This will mean rerouting of both cars and buses so as to segregate the two and eliminate direct competition. A close study will indicate many ways through which this may be brought about.

The real responsibility for the situation rests on the city government, first for permitting competition to get a foothold, and then allowing it to expand to its present proportions. Local transportation is a natural monopoly, as much so as any other utility. Perhaps the original grants of street railway franchises in St. Louis permitted destructive competition with lines on adjacent streets. After the lesson had been learned that this arrangement was unwise for the welfare of the people, the competing lines were allowed to consolidate and then were brought under drastic public regulation. But now to allow a transportation system with little or no regulation to compete against a closely regulated utility is, to say the least, not productive of the best results to the public and the investor. The speculator or the promoter who takes a chance in the inauguration of such competition unquestionably expects to reap a harvest. This, however, can only be done at the expense of the residents of the city—the car riders—who in the end will have to pay the bill.

Interstate Bus Lines May Be Under I.C.C. Jurisdiction

THAT it was a pronouncement of dangerous doctrine was the first reaction to the news that the Supreme Court in two decisions rendered on March 2 denied the right of the states to interfere with interstate commerce passing over their highways in motor vehicles. That reaction was the natural one. It appeared at first that interstate bus lines, which in some instances have flaunted the authority of state commissions, would be free to continue carrying on their nefarious practices, which in some cases have interfered with established bus lines as well as with interurban electric railways.

Technically, the states lost these cases, but the type of carriers it was sought to bring under jurisdiction are not to be permitted to continue to run without any measure of adequate responsibility either to the states or to the nation. Not only does the latest decision of the court distinctly say that the highways belong to the states and that certain rights to regulation adhere to the states, but the rendering of the decision serves to call attention anew to the need for the more definite fixing of regulatory responsibility. As a result a new measure has been introduced into Congress that would authorize the Interstate Commerce Commission to "make all rules and regulations of said motor transportation companies applicable to interstate business over public highways."

As the court saw it in the cases under review, the primary purpose of the state was not regulation with a view to safety or to conservation of the highway, but the prohibition of competition. The state denied to one and gave to another. One state approved the line; the other did not. Thus the Washington provision was interpreted as a regulation not of the use of the highways but of interstate commerce, which the court held it not only burdened but obstructed.

The new measure just introduced into Congress seeks definitely to fix responsibility. That is as it should be, but even now appropriate state regulations adopted primarily to promote safety upon highways and conservation in their use are not obnoxious to the commerce clause of the federal Constitution where the indirect burden imposed upon interstate commerce is not unreasonable. It is not an easy task, however, for the states to exercise the power that adheres in them and still not contravene the provisions of the commerce clause. It was in drawing this fine distinction that the state of Washington erred. If the new legislation goes through there will apparently be no need hereafter for the states to attempt to draw any fine distinctions.

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Renaming the American Association

A SUGGESTION that has caused widespread comment in the electric railway industry is that the electric railway men change their name. This suggestion was made at the Midyear Meeting of the American Electric Railway Association by Matthew C. Brush, president of the American International Corporation and formerly president of the Boston Elevated Railway. With his long experience in the street railway business, he feels that the men in the industry are not street railway men or electric railway men. Rather they are transportation men, and should stand ready to handle urban and interurban transportation of all sorts, "whether run by a gallon of gas or a few kilowatts."

The possibility of changing the name of the association is not entirely new, as was pointed out by L. H. Palmer in last week's issue of this paper and by H. L. Brown this week. It was discussed editorially by the JOURNAL in the issue of Feb. 2, 1924, at which time "American Transportation Association" was proposed. Mr. Brown this week points out the desirability of this name from the standpoint of euphony and ease in adapting it for the affiliated associations.

There may be some argument that the name is too inclusive. While the term is broad, the same thing may be said of the "American Railway Association," which might easily be interpreted to include electric railways.

It is desirable before any change such as this is proposed in definite form that it receive full discussion, and that arguments be brought forth representing all viewpoints. It is to be hoped that others will add their views to those already presented so that it will be apparent whether a change in the name of the association is desirable, and if so, what will best express its aims and purposes as they exist today.

Lessons to Be Drawn from the Pittsburgh Report

AN EDITORIAL in this paper about a month ago, in connection with recent figures on cost of subway construction in New York, pointed out that only the very largest cities in the country can afford the construction of subways. It is equally true that only the largest cities in the country need subways. To determine whether Pittsburgh has reached this point, Messrs. Turner and Haydock recently used the measuring stick of 5 miles from the business center to the built-up city limits. This distance was selected because it is about as far as can be covered in three-quarters of an hour by a passenger traveling by a street car or bus when he has a walk at each end of his trip. According to this criterion, Pittsburgh does not need a subway because most of the city is now within a circle with the radius mentioned.

There are two conditions, however, which suggest the desirability of a subway in Pittsburgh. One is that its main business district is contained in a small triangle, hemmed in on two sides by rivers and on the third by steep grades. This is very unusual. Logical expansion of this district is across one of these rivers where some business development has already taken place. It is partly to make this new business district more accessible and partly to reduce the street congestion in the triangle that a short subway through the old business district and extending to the new one is recommended by the engineers studying the situation. This subway would be used at present by surface cars, and a gallery or floor above the tracks is suggested for pedestrians.

The other condition favoring subways in Pittsburgh is that several of the districts outside the city limits are sufficiently populated so that with the city districts they could support a rapid transit line to Pittsburgh now or in the early future. The engineers therefore recommend that a rapid transit commission be organized promptly by the metropolitan district of which Pittsburgh is the center. The first work of this commission, after laying out desirable routes but before building subways, would be to acquire rights-of-way for high-speed surface transit in the suburbs. This should be done before the ground becomes too expensive, which will happen when the territory is settled.

The advice given to Pittsburgh in this particular can well be repeated to other cities. The principle too often followed is to postpone all thought of future transit needs on the theory that the future can care for itself. It can, but only at greatly increased expense and often discomfort. Transit planning should precede, not follow, the population. Every expanding city should be locating and reserving for future public use radial avenues in all reasonably possible directions of growth, and these avenues should be wide enough to accommodate rapid transit lines as well as future vehicular traffic. Many cities in Europe are following this plan now.

Preventing Carhouse Robberies a Present-Day Need

DESPERADOES appear to be making a popular pastime of holding up electric railway employees. There have been at least half a dozen of these occurrences in the last year. The latest successful coup was at Chicago recently. The bandits are said to have got away with $9,000. The amount may be exaggerated. It is to be hoped that it is. Entirely aside from the matter of the difference between the actual and the estimated loss in cases of this kind, there is always the attendant physical danger to the employees and the likelihood of the breaking down of the morale among the men. Fortunately in the Chicago case there were no untoward circumstances other than the loss of the money.

The Chicago hold-up was unusually spectacular. The carhouse appears to have been fairly well protected from approach by the ordinary channels. Evidence, however, indicates connivance from the inside, not deliberate, perhaps, but connivance based on fairly exact knowledge of what was going on at a particular time and of the best means of indirect approach. It is nearly always difficult to guard against such knowledge getting abroad, but it is particularly difficult to do so where so many men are employed and the same processes are carried out day in and day out and year in and year out.

The criminal is not slow to ponder the news of the day. The successful hold-up has a meaning all its own to him. With him, no less than with others, success is something to be emulated.

The dangers to which the Chicago company was open are largely inherent everywhere in electric railway work, not only at carhouses but at passenger stations on interurban and rapid transit lines. It behooves companies everywhere to be doubly on their guard against the temptations which the accumulation of ready cash offers to the culprit.

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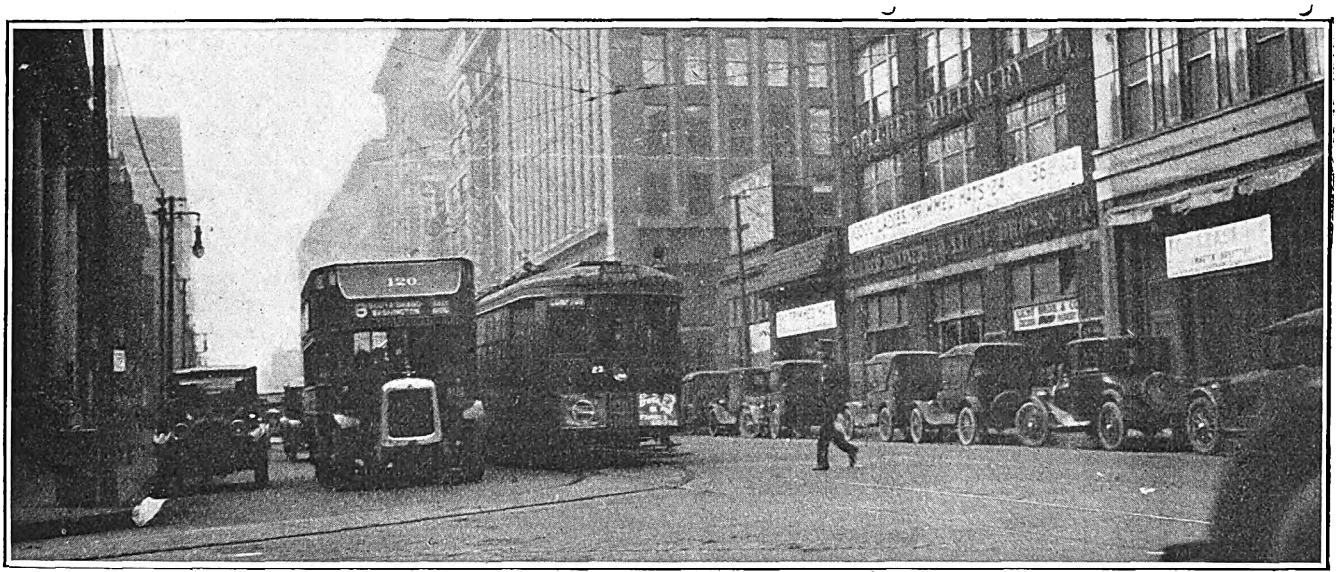
Transit Conditions in St. Louis Today

Traffic Congestion on Principal Streets Is Directly Traceable to Inadequate Traffic Ordinances and to Lax Enforcement—Competition Between Street Cars and Buses on Same Streets Leads to Much Interference—Conditions Surrounding Entrance of Competing Bus Systems in City Are Given, as Well as Developments Leading Up to Present Situation

By Morris Buck and Carl W. Stocks



Washington Avenue, St. Louis, Looking West at 18th Street, as It Appeared on the Afternoon of Feb. 24. Note Parked Vehicles and Lack of Clearance Between Car and Bus

ST. LOUIS at the present time has what may be termed two major and one minor passenger transportation systems, a street railway, a bus system and a jitney line operating in several instances over double-tracked narrow streets in the heart of the city on which parallel curb parking is permitted for the greater portion of the time. This means that the traffic strip consists very largely of that part of the street occupied by the car tracks, with the result that in actual operation there is continual interference between the different classes of street users to the detriment of the passenger traffic of the transportation systems. Each of the two major transportation systems covers the city to a greater or lesser extent. The United Railways Company, which operates the street cars, is the result of a consolidation some 25 years ago of all the surface car lines of the city. The buses operated by the People's Motorbus Company have been in use only since May 28, 1923, when the company began service with its first series of 17 buses.

St. Louis is situated on a bluff on the west bank of the Mississippi River. The business district extends from the riverfront westward for nearly a mile. The portion of the business district extending from the river front up to Third Street is on the side of the bluff, and is of no importance in the transportation picture. The city has an area of 61 square miles, with a population as given by the 1920 census of 772,897. There are more than 1,000 miles of streets, some 70 per cent of which are paved.

Street car lines cover the entire city, with the exception of a few residential districts developed in the last few years. The United Railways operates 436 miles of single track, exclusive of the interurban line from Hodiamont to St. Charles. Practically 90 per cent of this is double track. There is proportionally more track in St. Louis than will be found in almost any other large American city, or more than 7 miles of track per square mile.

In addition to the United Railways, the Illinois Traction System enters the city over the McKinley Bridge and reaches an interurban station at 12th and Lucas Streets. Through trains are operated between St. Louis, Springfield and Peoria and connections are made for Decatur, Champaign, Urbana and Danville. The East St. Louis & Suburban Railway and associated lines enter the city of St. Louis over the Eads Bridge, the terminal being at the end of the bridge at Third and Washington Streets.

Besides the electric railways covering St. Louis, the People's Motorbus Company, an independent system, gives service on several of the main streets. The principal downtown terminal of this system is at Third and Washington Streets, at the end of Eads Bridge. A number of the most important street car lines also terminate at this point on loop tracks in the plaza.

The minor means of passenger travel applies only to one route, along the line of the Washington-Delmar bus route. Here are operated a number of passenger automobiles, which are known as "service cars," and which in character of operation differ but little from the jitneys which have been familiar in various American cities. Their number is variously estimated at 100 to 400. Ne definite information was obtainable as

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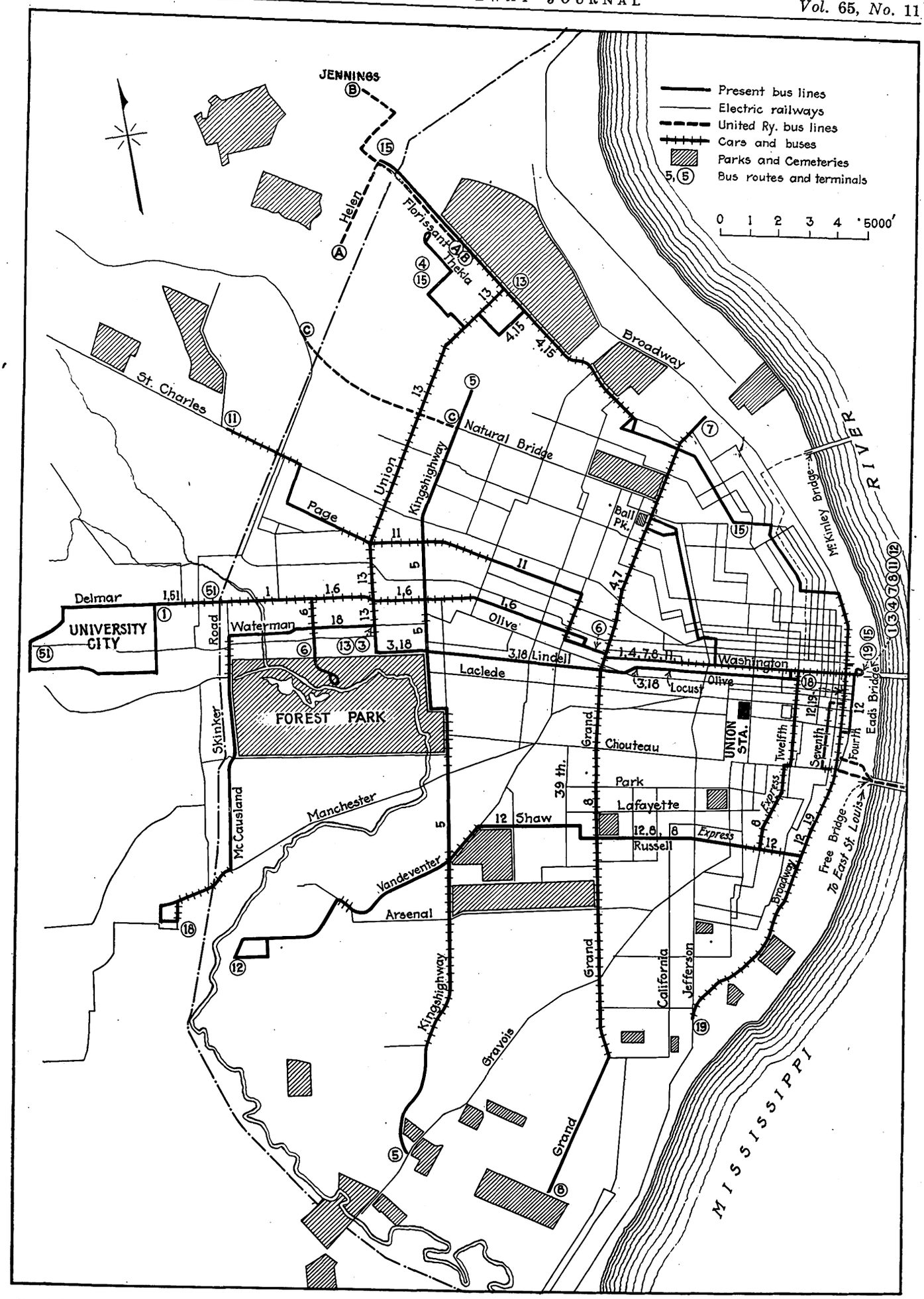

Street Car Tracks and Bus Routes in St. Louis and Environs. The People's Motorbus Company's Lines Are Shown Solid and Those of the St. Louis Bus Company Are Shown in Dotted Lines

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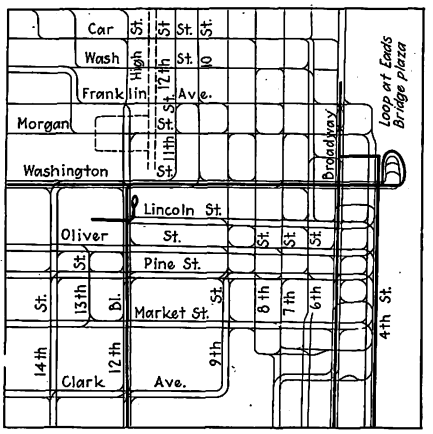
to the exact number licensed by the city authorities. These service cars carry between 2,000 and 3,000 passengers a day, as indicated by the checks taken last December and February. Details of the observations are given in an accompanying table.

The People's Motorbus Company in recent advertising states that it is operating 89 miles of lines, although the table on page 404 shows but 67 miles of streets covered. Over these streets 12 routes are in daily operation.

Representatives of the bus company say that only 25 to 30 per cent of the bus routes compete with the car lines. Inspection of the map of car and bus routes indicates, however, to what extent the bus system can be considered directly or indirectly competitive. At the ends of several of the bus routes exclusive territories are served, such as Lindenwood, Carondelet Park, University City, and several districts along Kingshighway.

The methods of routing the cars and buses differ. All the bus lines running into the heart of the city start at the Eads Bridge Plaza at Third Street and Washington Avenue with the exception of the route that terminates on Twelfth Boulevard. All but three of these lines run on Washington Street through the congested business district.



Track Layout in the St. Louis Congested District, Showing Also Bus Routes

NUMBER OF "SERVICE CARS" OPERATED AND PASSENGERS CARRIED BY THEM ON WASHINGTON-DELMAR ROUTE, ST LOUIS

	Eastbound				Westbound			
Number of "Service Cars"	7–8 a.m.	8–9 a.m.	9 a.m.–3 p.m.	Total	3–5 p.m.	5–6 p.m.	6–7 p.m.	Total
Dec. 17, 1924	116	107	260	483	75	63	68	206
Dec. 18, 1924	70	89	286	445	74	89	73	236
Feb. 17, 1925	88	96	256	440	61	88	80	229
Feb. 18, 1925	126	140	317	583	52	99	96	247
Number of Passengers								
Dec. 17, 1924	444	444	395	1,283	286	293	217	796
Dec. 18, 1924	163	402	443	1,008	244	307	245	796
Feb. 17, 1925	389	410	661	1,460	164	353	378	895
Feb. 18, 1925	466	581	680	1,727	114	417	425	956

The railway owns 1,435 motor passenger cars and 179 trailers. Practically all are double-truck cars seating from 50 to 60 passengers. The older motor cars are of the rear-entrance, front-exit, prepayment type, while the more recent ones are of the front-entrance, center-exit, pay-as-you-pass type. The trailers are all of the center-entrance type.

Three different kinds of buses are in use. Those first placed in service, of which there are 17, are of the Fifth Avenue L type, seating 22 passengers on the lower deck and 29 on the upper deck, a total of 51. The newer double-deck buses, numbering 103, are of the Yellow Z type with a capacity of 67 passengers, 28 on the lower deck and 39 on the upper. In addition the company has 53 single-deck Yellow type Z buses seating 29 passengers.

There is some difference in the wage scales of platform men on cars and buses. Since Aug. 1, 1922, operators receive a maximum of 67 cents per hour after 3 years of service, the rates for earlier years being 50, 56 and 62 cents. Bus conductors receive as a maximum 60 cents and drivers 65 cents.

Fares Charged and Traffic Regulations

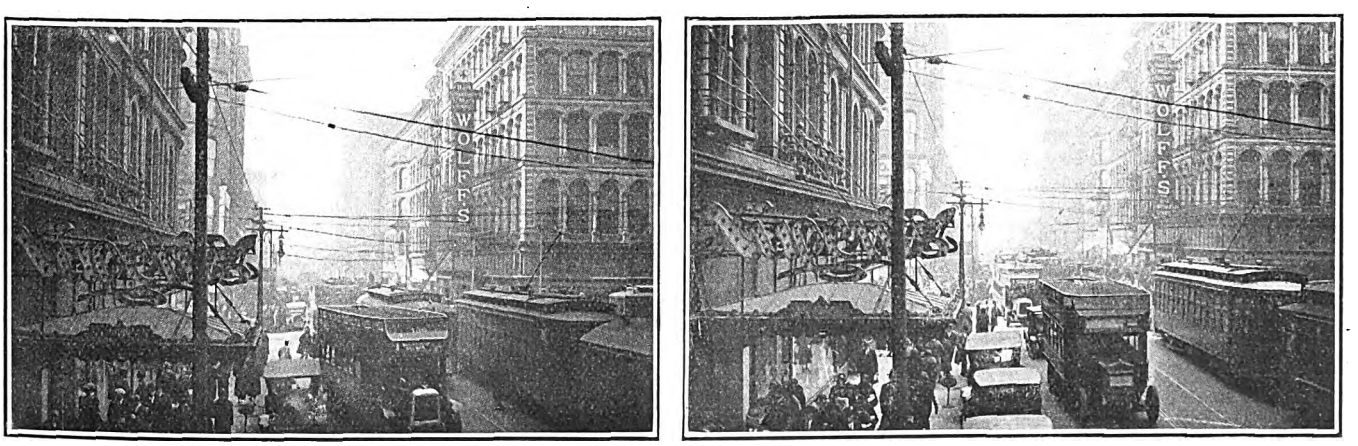
Street car fares have changed to some extent during the receivership period, which began in 1919. Present fares are 7 cents cash with universal free transfers, and 3 cents for children under 12 years of age. Tokens are sold in any quantity by conductors for convenience only, at the full fare rate.

On the buses operated by the People's Motorbus Company a straight 10-cent fare is charged. Free transfers are issued to provide a continuation of the ride in the same general direction but not to permit doubling back.

The St. Louis Bus Company, controlled by the reorganization committee of the United Railways, charges a 10-cent fare, with free transfers to street cars. The street cars issue transfers to these buses at 3 cents. This gives the same 10-cent rate of fare for through rides into the territory served by either bus company.

The many "service cars" in operation along the Washington-Delmar Avenue bus route charge a flat fare of 25 cents. Railway officials state that these cars furnish very little competition, though it is apparent that they do a considerable amount of business. The service cars or jitneys furnish the most rapid means of transportation in the city for the territory served.

Traffic movement in St. Louis is under control of a traffic council which was created by a city ordinance approved on Feb. 28, 1924. Under the terms of this



Two Views on Washington Street Looking West at Broadway. These Were Taken During the Noon Hour on Jan. 24. Note Parked Vehicles Near Corner and Buses Running on Car Tracks

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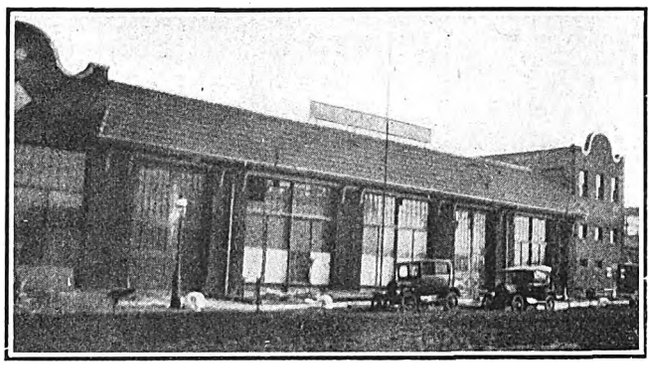

One of the Garages and the Office of the People's Motorbus Company Are Housed in This Building at 5615 Forest Avenue

ordinance the traffic council has power to control and to prohibit parking as found necessary; to regulate the movement of vehicles and pedestrians; to erect traffic signals and signs; to establish safety zones and one-way streets.

What is known as the "congested district" has been established in the business section of the city. This extends from Franklin Street on the north to Market Street on the south, and from 12th Street on the west to Fourth Street on the east. This district is 9 blocks or approximately 3,000 ft. in each direction. On Olive, Locust and Washington Streets within the congested zone all parking is prohibited from 7 a.m. to 10 a.m. and from 4 p.m. to 6 p.m., except that commercial vehicles may park for periods not to exceed 15 minutes. These are the principal east and west traffic arteries. Washington Street terminates at the Eads Bridge and is the principal thoroughfare for reaching East St. Louis across the Mississippi River, although its width between curb lines is only 50 ft. On the north and south streets, Sixth, Seventh, Eighth and Ninth, parking is prohibited on the left-hand side in the direction of travel. Parking of one vehicle alongside another is also prohibited. Vehicles are not permitted to stop except near the right-hand curb, and so as not to obstruct the sidewalk crossing.

Continuous parking is not allowed in the congested district for a longer period than 1 hour. This is intended to include also the case where a vehicle is moved within the limits of the block in which it is parked or where it is moved out of the block and returned within 15 minutes.

Vehicular traffic is required to stop not less than 5 ft. behind any street car going in the same direction which has stopped for the purpose of taking on or discharging passengers, and is required to remain standing until the car has taken on or discharged its passengers. An exception to this is made at regularly established safety zones, or where the street width is great enough that the vehicle may pass at a distance not less than 8 ft. away. In such cases, vehicles are required to slow down and proceed cautiously. Drivers of vehicles are permitted the right-of-way along street car tracks, provided they do not interfere with the use of the tracks by street cars or violate other provisions of the traffic ordinances. The ordinary restrictions prohibiting passing a street car on the left or passing other vehicles to the left of the center line also apply.

Vehicular speeds in excess of 25 m.p.h. are prohibited anywhere within the city, and in the congested district the speed is limited to 15 m.p.h. Motor trucks with a capacity of 2 tons or less are limited to 20 m.p.h. and those with a capacity of more than 2 tons to 15 m.p.h. Vehicles with metal tires are restricted to 6 m.p.h.

Lax Enforcement of Traffic Laws

Observations made in St. Louis indicate that the traffic regulations are not strict enough, and that they are not rigidly enough enforced. The parking regulations allow a car to remain in a location for 1 hour. At the end of this time it must leave, but another vehicle can take its place, so that all the available parking space is likely to be occupied throughout the day. In fact, it is the more difficult for moving traffic on account of the continual changing of cars in the parking space.

Conditions on some of the streets in downtown St. Louis are shown in accompanying illustrations. Attention is called to Pine Street, which is typical. There is a row of parking on each side, extending from one street intersection to the next. Some years ago 12th Street was widened between Washington and Market. The wide roadway there is not being used as it should be, since the 120-ft. space between curbs is used for rows of automobiles parked parallel to each curb and in addition there is usually a row of automobiles parked crosswise on either side of the car tracks in the center.

Street car stops are laid out almost uniformly on the near side of street intersections and bus stops on the far side of the intersections. Parked automobiles were found to encroach on the space laid out by the department of streets and sewers for such car and bus stops. While it is perhaps not so serious at the street car stops on the near side, the intrusion of parked automobiles into the bus stopping places makes it the practice of the bus drivers to run up as close as possible to the curb near the street intersection and then turn the front end of the vehicle sharply toward the street car tracks, so the bus can start up without backing. Frequently, the front end of the bus when so stopped does not clear the street car track. This is particularly true on certain parts of Washington Street, that have not been widened. The large number of parked automobiles makes it necessary for the buses to run in the roadway between the line of parked vehicles

RELATIVE TIME OF TRIPS ON CARS AND BUSES IN ST. LOUIS, JANUARY AND FEBRUARY, 1925.

Note—Inbound trips in morning rush; outbound trips in evening rush.

Observer	Route	Vehicle	Direction	No. of Trips	Minutes, Average Wait	Ride	Total
A	Thekla and Kingshighway to 4th and Lucas	Bus	In	4	6½	37½	44
	Florissant and Robin to 8th and Locust	Car	In	7	1	41	42
	Fourth and Lucas to Thekla and Kingshighway	Bus	Out	1	17	38	55
	Ninth and Pine to Florissant and Robin	Car	Out	6	2½	41½	44
B	Clara and Page to 7th and Washington	Bus	In	7	6	33	39
	Clara Way and Hodiamont to 7th and Locust	Car	In	15	1½	35	36½
	Seventh and Washington to Clara and Page	Bus	Out	3	14	34	48
	Seventh and Locust to Clara Way and Hodiamont	Car	Out	10	2	35	37
C	Grand and Crittenden to 7th and Washington	Bus	In	10	7	30	37
	Arsenal and Louisiana to 7th and Pine	Car	In	9	1½	27½	29
	Third and Washington to Grand and Crittenden	Bus	Out	7	2	38	40
	Sixth and Pine to Arsenal and Louisiana	Car	Out	9	4	31	35

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and the tracks. The space is so small that in order to obtain running clearance the buses frequently have to encroach on the car track area. In some cases, where there is a double line of automobiles next to the curb, the buses must run on the street car track if they are to operate at all.

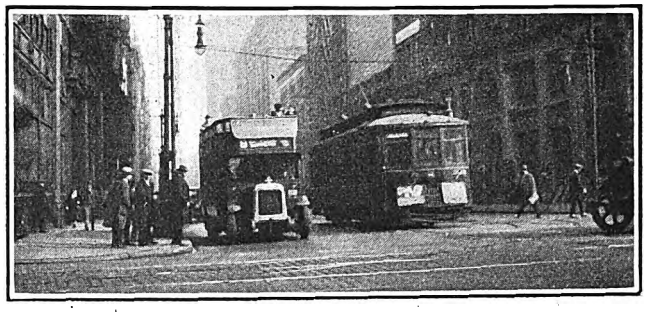
Naturally, under conditions such as these, there is considerable interference between street cars and buses operating on the same street. Charges are made that buses interfere maliciously with the operation of cars, and on the other hand that cars interfere in the same manner with the operation of buses. The writers, observing traffic conditions in St. Louis for several days, did not see conditions that actually confirmed these charges. Individual bus operators did run their buses too close to the car tracks and did operate between safety zones and curb, where there was considerably less space than would be considered ordinarily running clearance. In other cases, they passed between the street car and the curb where there was no safety zone and where the clearance was less than the 8 ft. provided by the traffic ordinance. Passengers attempting to board or leave standing street cars had to dodge to keep out of the way of the bus, even though it was running at comparatively low speed. The actions of the bus drivers, however, did not differ from those of the drivers of private automobiles which were passing along the street at the same time.

Observations made in the congested district and elsewhere showed that where there is considerable vehicular traffic, neither car nor bus has any decided advantage as to running time. The speeds of the two are about the same. The street cars accelerate more quickly than the buses, while the buses brake more quickly than the cars. Determination of which one leads appears to depend principally on which vehicle gets away first.

Naturally, with the buses running along the same streets with the cars and running on the tracks at certain points as they do, their operation slows down the street cars to an appreciable extent. A similar result would occur, of course, if the vehicular traffic increased from any other source.

Other competent observers say that the bus service is not elastic enough to take care of the afternoon rush, which is short and very sharp, coming between 5 and 5:30 o'clock. The loading does not all take place at one point in the evening, but it is distributed along the main arteries leading out of the business district, such as Washington Street. Queue loading is practiced for the buses at certain heavy loading points. Frequently passengers have to wait some time to get accommodation on a bus. An instance was cited where passengers had to wait as long as 17 minutes at a loading point.

In order to determine the comparative running time of cars and buses, and particularly the elapsed time, including waits, the men of one business firm rode both cars and buses to and from their work. The results are tabulated herewith. One man, for instance, took the bus 4 days and the car 7 days from Thekla and Kingshighway to Fourth and Lucas Streets. On the average, he had to wait 6½ minutes for the bus, followed by a ride of 37½ minutes, or a total of 44 minutes. Riding the street car for 7 days, the average wait was 1 minute, and the average ride 41 minutes, making a total of 42 minutes, or 2 minutes less than the time taken on the bus. Other men have had similar experiences. In general, the time required on the bus



Washington Street Looking East at 12th, about 3 o'Clock on Feb. 24. The Bus Is Stopped Opposite a Safety Zone

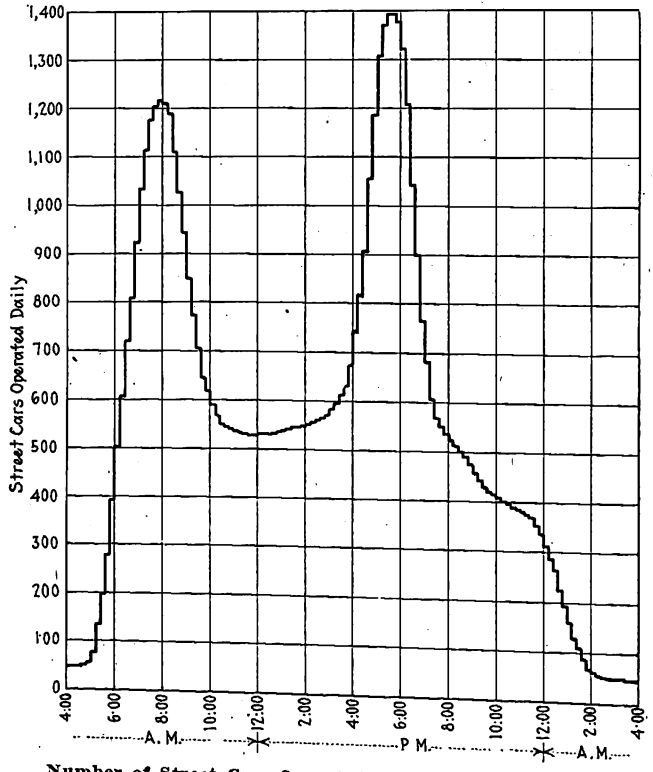
was from 2 to 11 minutes greater than on the car. Personal observations indicate that these figures are fair, although they do not give the total time between home and office.

These results indicate that the factor which makes the bus ride take more time is the greater street wait. In some cases, this was merely due to the longer headway, while in others it included an additional wait, due to buses passing up passengers on account of the seat for every passenger policy.

Schedule Requirements of Street Railway

The street railway is required by regulations of the state commission to operate a certain minimum schedule with a 6 to 7-minute headway in the non-rush hours. The regulations further require that seats furnished in the non-rush period shall average 30 per cent above the number of passengers. Extra seats must always be available in the street cars, and could be used by persons now riding buses without extra cost to the street railway.

The buses do cut down the peak loads on the street cars, but it is not yet apparent that the street railway has reduced service in the rush. This is evident from charts furnished by the railway and which are shown herewith. Car riders are glad to have the buses take



Number of Street Cars Operated on a Typical Weekday, Plotted by 12-Minute Periods

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away a certain amount of the peak congestion, as more room is left for them on the street cars. This, of course, gives a certain amount of popularity to the bus even among people who do not care to use it regularly.

The gross revenues of the street railway last year were approximately $1,250,000 under those of 1923. In that year the United Railways carried approximately 280,000,000 revenue passengers, while in 1924 there were only 267,000,000, a reduction of 13,000,000. The number of people carried on the buses during 1924 was approximately 13,000,000. While this number is almost identical with the number lost by the railway, it would be inaccurate to state that the one balances the other. Business conditions were bad all over the country for a certain part of last year, and St. Louis was no exception. Then, too, the buses have obtained riders from other sources and there has been a certain increase in the riding habit due to the introduction of a new means of transportation.

Financial History of United Railways

The St. Louis railway system has always been a good earner since its constituent companies were consolidated in 1899. For the past 25 years it has earned well over its bond interest, except for 1918 and 1919. The present financial set-up of the company includes $100,000,000 of stock and bonds. There are about $60,000,000 in interest-bearing securities with an average rate of 4½ per cent. The gross income has averaged $3,500,000 or more, while the fixed charges were approximately $2,750,000. In 1924, it is said that the net income had fallen off to $2,900,000, while fixed charges had risen to about $3,000,000, so that it was necessary to dip into surplus to meet them. Actual figures for the year are not yet available.

SCHEDULE SPEED, UNITED RAILWAYS OF ST. LOUIS, 1919–1924

	Car-Miles per Car-Hour	
	Entire Year	Month of December
1924	9.73	9.55
1923	9.75	9.66
1922	9.85	9.79
1921	....	9.81
1920	....	9.83
1919	....	9.80

In 1900, just after the consolidation, the physical property of the United Railways had a value of not more than some $30,000,000 or $40,000,000. Earnings, however, were capitalized regularly, and this money was put back into the property. In several years, in the period from 1899 to 1909, the company paid dividends on its preferred stock amounting to $900,000 a year, just about using up net income. Nothing was ever paid on the common stock. While the business grew steadily, the net income remained about the same, operating cost rising approximately as fast as revenues.

There was, however, no attempt made to starve the property. Even at the time of the receivership, the property was not run down and it has been well maintained since the receiver has been in control.

In 1909, with several maturities approaching, the bankers would not refund with the then existing capital structure. Preferred dividends were cut off and the money was used for retiring the bonds as they came due, and also to make betterments in the way of tracks, loops, and new cars. In the period from 1909 to 1919, the company actually paid off about $6,000,000 worth of bonds and reinvested in the property some $10,000,000 of earnings.

In 1918 another bond issue of $3,500,000 came due. The company paid off $1,200,000 of this out of earnings. The War Finance Corporation supplied the remainder, or $2,300,000. After the close of the war the War Finance Corporation called its loan at about the same time that another $2,000,000 issue came due. With no funds available the company was forced into receivership. The receiver immediately issued receiver's certificates to the amount of $4,200,000 to apply in payment on the principal of the bonds. These certificates have been extended three years, or to Oct. 1, 1926.

Track Extensions

In 1899, when the companies were brought under one control, the city of St. Louis was already overtracked. By 1904, however, the lines were extended and new money was put in so as to make a fine system serving all parts of the city. It is said that all track extensions that could possibly be considered as necessary at any time within the last 10 years, or even today, could be built for less than $1,000,000. During the period from 1910 to 1914, when regulation was under control of the city, there was some demand for extensions, but the company could not finance them, due to lack of credit. After the formation of the State Public Utility Commission in 1914, those who had been seeking extensions appeared before it and the extensions were ordered. The company appealed to the courts, and finally the State Supreme Court decided that no state authority could order extensions not provided for in the company's franchise.

Reorganization Plans

After the receivership began in 1919, a reorganization committee was appointed, with instructions to reduce the capital to a reasonable basis. The first step was a valuation by the State Public Service Commission, in which the commission, the city and the company were represented. The valuation was made in line with present-day prices. Pre-war prices were adopted as a basis and 50 per cent added to bring them up to date, with a deduction made for depreciation. On this basis, the valuation as of January, 1919, amounted to $51,800,000. This amount has since been added to by the reinvestment of earnings from the property, until today the figure has gone up to about $58,000,000.

The reorganization committee has worked out a plan whereby the capital structure approximates this amount. This plan has been carried through in detail, and is now understood to be near acceptance.

No fixed return is provided for in this reorganization plan. A reasonable return in this case has been assumed at about 7 per cent, which means gross income of some $4,000,000. Last year the company made about $2,900,000 net. This year, unless there is a big resumption of business, it is likely that the net return of the railway system will be less. This is to a considerable extent because the latest bus lines were not installed until so late last fall that the full measure of competition will not be felt until such time as the buses obtain full riding on the top deck.

What Increased Fares Would Mean

It is said that an increase from the present straight 7-cent fare to an 8-cent cash fare with reduced-rate tickets would make up the loss caused by the reduction in business which has taken place since the buses have been in operation. An 8-cent straight fare would give

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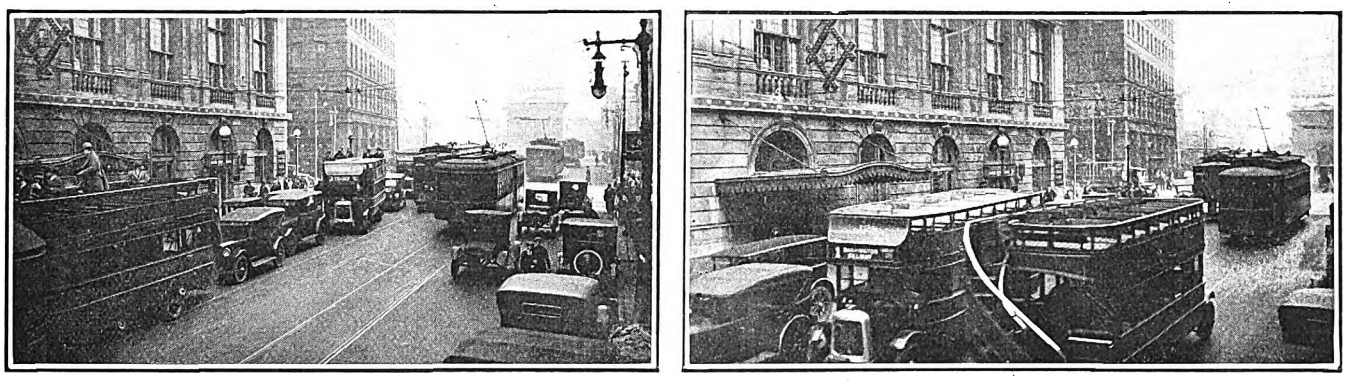
an increase over the present revenue of about $3,000,000, which would leave a considerable margin above the reduction due to bus competition.

One of the principal reasons why the company has not applied for a higher rate of fare at present is said to be that franchises for three-quarters of the system expire in 1939, while those for the remainder of the system, which includes the best-paying lines, expire in 1942. The bankers have been reluctant to furnish the necessary capital to effect the reorganization without a new long-term franchise.

Others familiar with the situation are of the opinion that it would be better to apply for an increased fare now and so get the company out of receivership, even though the franchises expire in a relatively short time. It would then be possible for the reorganized company to apply for a new franchise providing for a reduction in fare.

Scheduled speeds of the United Railways cars for a number of years previous to the advent of buses have risen to approximately 9.8 car-miles per car-hour actually run. In 1923, after the first bus line had been started, there was some reduction in speed, the average for December being 9.66 m.p.h. There was a further reduction during 1924, after the last series of bus lines was put in operation. The average speed for December was 9.55 m.p.h. These changes are shown in one of the tables. The reduction in speed, according to the company, is mainly attributable to the presence of buses on the streets, with resultant interference.



Congestion Caused by Buses and Other Vehicles. These Views, Taken Jan. 24, Are Looking East on Washington Street Near Fourth, with the Eads Bridge in the Background

Bus Competition Started

The Missouri Motor Bus Company, which was formed in 1919, began operating on Feb. 10, 1920, a bus line on a route approximately the same as the present Delmar line of the People's Motor Bus Company. A 10-cent fare was charged. The buses were not entirely satisfactory, being mounted on truck chassis. The management was not familiar with modern transportation methods, and the enterprise failed after about a year of operation.

Augustus Barnes next came into the picture. He was a theatrical man from New York. He obtained the passage of an ordinance known as 30,911, which gave to the Board of Public Service the right to grant permits for bus operation, thus taking it away from the province of the Board of Aldermen. This ordinance was approved on July 12, 1920. It includes general regulations regarding the granting of permits under which motor buses may be operated in the city, but states that buses may not be operated until properly licensed and bonded. The bond that must be provided is $3,000 for each vehicle operated, except that if one person, firm or corporation proposes to operate more than five such vehicles the total bond required shall be $10,000. When once granted permits are revocable only after an advertised public hearing similar to that for the granting of a permit, and revocation cannot become effective until 30 days after action by the board. It is also provided that in case the bus company shall have been in operation for a considerable period of time an additional 10 days shall be included for each year of operation above the 30 days. Competing motor buses are not permitted on a route already established unless the applicant shall demonstrate to the board that such additional service is necessary.

Permits are granted upon payment of $25 as an annual license tax for each motor bus, and in addition a sum equal to 3 per cent of the gross receipts derived from transportation. Payment of these taxes does not exempt the owner from payment of all the ordinary licenses and taxes levied by the city and state.

The rate of fare that may be asked for bus service cannot be in excess of 10 cents for the entire journey or any part thereof designated by the passenger. There is nothing in the ordinance, however, to prevent a lower rate being charged.

Bus permits may be transferred from one owner to another upon application with affidavit proving the sale. The license collector must then issue a new license in favor of the purchaser.

The original bus permits, which were granted on Oct. 3, 1922, and accepted on the 16th of the same month by Augustus Barnes, covered principally an east and west route along Washington Avenue and Delmar Boulevard from the Eads Bridge to the city limits at University City; a north and south route along Grand Avenue from Carondelet Park to the Water Tower at the intersection of 20th Street; certain deviations from the Washington Avenue route to cover the downtown theater district during the evening; a route from the east plaza of the Municipal Bridge in East St. Louis over the bridge and through the business district to the McKinley terminal at 12th and Lucas Streets; a route along DeBaliviere Avenue from Delmar Boulevard into the municipal theater in Forest Park. A fare of 10 cents was specified with free transfers between intersecting routes. Other conditions were inserted conforming to the terms of the ordinance of 1920. All these routes were later operated with the exception of the one over the municipal bridge to East St. Louis.

On Nov. 21, 1922, an additional permit was granted

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OPERATING DATA, PEOPLE'S MOTORBUS COMPANY OF ST. LOUIS, AS OF FEB. 26, 1925

Route	One-Way Mileage Gross	Net	Number of Buses A.M. Rush	Mid-day	P.M. Rush	Evening	Headings, Minutes A.M. Rush	Mid-day	P.M. Rush	Evening	One-Way Running Time, Minutes A.M. Rush	Mid-day	P.M. Rush	Evening
1. Washington-Delmar	7.01	7.01	26	21	31	18	4	4	4	5	39	39	44	41
3. Locust-Lindell	4.85	4.28	8	8	8	0	8	8	8	..	30	30	35	..
4. North Grand-Florissant	8.62	....	7	7	7	8	16	16	16	12	51	51	55	51
5. Kingshighway	8.14	8.14	14	10	10	10	8	8	8	8	38	38	40	38
6. Forest Park via DeBaliviere Avenue	3.69	0.57	Sunday Only—Weather Permitting											
7. North Grand-Washington	5.02	2.50	4	4	4	0	16	16	16	16	29	29	33	29
8. South Grand-Washington	8.13	5.61	19	17	21	17	6	6	6	8	48	48	52	48
9. Grand-Russell express	7.93	1.90	3	0	0	0	10	..	..	..	38	..	..	..
11. Page Boulevard	8.00	5.34	19	19	21	19	5	5	5	5	44	44	50	44
12. Lindenwood via Russell Boulevard	8.45	8.31	13	13	13	13	8	8	8	8	49	49	51	49
13. Union Boulevard	4.07	4.07	6	6	6	5	10	10	10	10	20	20	21	20
15. Florissant-Broadway (Helen)	7.72	7.72	5	5	5	5	16	16	16	16	38	38	40	38
15. Florissant-Broadway (Thekla)	7.58	2.05	5	5	8	8	16	16	16	12	38	38	40	38
18. McCausland-Skinker-Waterman (12th Street)	9.56	....	12	12	12	0	9	9	9	..	50	50	54	..
18. McCausland-Skinker (Eads Bridge)	10.13	4.84	0	0	0	14	..	..	..	8	..	..	..	53
19. South Broadway	3.98	1.98	5	5	5	4	10	10	10	15	23	23	25	25
21. University City-Clayton	2.88	2.31	2	2	2	2	15	15	15	15	12	12	12	12
Totals	115.76	66.53	148	134	153	123								

Total schedule miles operated: Weekdays, 23,251; Sundays, 17,521.
The first bus out on each route leaves outer terminal at 6 a.m. weekdays, and on Sunday at 7 a.m.
The last bus leaves downtown terminal at 12:30 a.m. daily.

for a route running along Locust Street and Lindell Boulevard from the downtown district to Washington University.

The original permits issued to Augustus Barnes were transferred to the United States Bus Transit Corporation, which was incorporated under the laws of the state of Delaware on Nov. 12, 1922, with a capitalization of $3,000,000. The officers of this company were Joseph L. Rhinock, president; John H. Havlin, vice-president and treasurer; Benjamin L. Heidingsfeld, secretary and general attorney.

On May 25, 1923, the People's Motorbus Company of St. Louis was chartered under the laws of Missouri, with a capital represented by 10,000 shares of common stock of no par value, which were outstanding. On the date of its formation, the permits then held by the United States Bus Transit Corporation were assigned to the new company, and operation actually began on May 28, 1923. The officers of the People's Motorbus Company are Richard W. Meade, president; Robert Burkham, vice-president, and W. Frank Carter, general counsel.

Desiring to secure the protection of the Public Service Commission of Missouri, it applied to the commission for recognition as a common carrier and asked for certificates of public convenience and necessity along the streets occupied by the company at that time. The commission denied the application on Oct. 13, 1923, holding that the People's Motorbus Company was not a common carrier within the meaning of the public service commission laws of Missouri.

Chicago Motor Coach Enters Picture

In the latter part of 1923, interests representing the Chicago Motor Coach Corporation, which later was merged with the Omnibus Corporation, exercised an option obtained for the purchase of the People's Motorbus Company of St. Louis. This was done through a holding company, the St. Louis Motor Coach Corporation, which was organized with a capitalization of 35,000 shares of Class A or preferred stock and a like amount of Class B or common stock. The Class A shares were sold at $45 or $50 each, with a bonus of one-fifth share of Class B stock. Figured out roughly on the basis of sale price, the stockholders received around $62 a share on their original investment when the property was taken over by the Chicago Motor Coach Corporation. The principal owners are John Hertz of Chicago, F. F. Sims of Houston, Tex., and J. L. Rhinock of New York. The latter two formerly held 40 per cent of the securities of the People's Motorbus Company of St. Louis.

When the People's Motorbus Company interested other capital, 50 more buses were put on, principally on North and South Grand Boulevard, Lindell Avenue to Forest Park, and in increase of service on Delmar Avenue.

Realizing that the bus competition might prove serious, representatives of the railway reorganization committee obtained an option to buy out the bus company. The option price agreed on was as follows:

Physical property (82 buses and equipment)	$1,000,000
Cash, rights, etc.	1,400,000
From first year's operation as earned	400,000
Total	$2,800,000

The negotiations failed because holders of the St. Louis Transit 5s, one of the underlying railway bond issues, would not consent to the plan after a tentative agreement had been reached with the holders of all the bonds. Since these bonds had the lowest seniority rating, it was questionable, on the basis of a $58,000,000 valuation, whether they would receive the same satisfactory treatment as other bonds in the reorganization. Hence, the request was made by the reorganization committee that holders of these bonds assume the responsibility for raising funds for purchase of the bus property.

Following the failure of this agreement in August, 1924, the bus company pressed its application for additional permits. Fifty buses were purchased from the Yellow Coach Manufacturing Company.

The city administration is reported to have warned the railway company of developments with regard to bus operation. The railway company maintained that it could not put on buses nor build extensions, as the right to do these things had been refused by the federal court. The reorganization committee, however, believed that it was necessary to get into the bus business. The St. Louis Bus Company was formed by the committee and applications filed for a considerable number of routes practically identical with those asked by the People's Motor Bus Company. As for fares, each bus company proposed a 10-cent rate, but the St. Louis Bus Company offered free transfers between its buses and the street cars. The People's company, on the other hand, refused to consider any transfer arrangement with the street cars, but was willing to grant transfers between its own routes.

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Public hearings were held by the Board of Public Works on both applications. It was here that the first clash of interests occurred between the two bus organizations. The city's public service board was then composed of E. R. Kinsey, president; J. A. Hooke, director of public utilities; C. H. Fiske, director of streets and sewers; Nelson Cunliff, director of public welfare; and J. A. McKelvey, director of public safety and building commissioner. Messrs. Kinsey and Hooke at that time appeared to favor the application of the St. Louis Bus Company. Mr. Hooke went away on a vacation in the latter part of August. Mr. Kinsey left St. Louis on Labor Day with a committee of the Board of Aldermen, which had been appointed to make a tour of the principal cities in the East for the purpose of investigating rapid transit and for studying motor bus policies. It is said by some that these two men left St. Louis under the impression that they had the promise of the other three to do nothing until they returned with regard to the granting of any bus permits. Others say that they left with the understanding that what the remaining three members did would be agreeable to them. On Tuesday, Sept. 2, the day after Mr. Kinsey left St. Louis, the remaining three members, who constituted the majority of the board, voted to grant the permits requested by the People's Motorbus Company. Soon afterward the board granted a few permits to the railway for the operation of stub-end bus lines as feeders to its railway lines in outlying territory.

Interviews with disinterested persons indicate that a great majority, possibly 90 per cent, of the population approves the attitude of the street car company. Its past mistakes have largely been forgotten in view of its present good performance. The track and paving are in good condition, the rolling stock is fairly modern and well kept, the service is adequate, and the speed is above that found in many cities.

Of course, there always are a few soreheads. Such persons often make the bulk of the noise that is heard in criticism. They do not, however, represent any large share of the riding public.

As for the buses operated by the People's Motorbus Company, they have made many friends since they have been in operation. The operating company is aggressive, it employs excellent publicity methods, and tries to render good and efficient service. Local opinion is that the buses in St. Louis are there to stay. The public does not care greatly who operates the buses, but does desire a co-ordination of service, so that a maximum of benefit will be obtained from the two systems. By this it is not inferred that the buses should be relegated to outlying areas. Undoubtedly, certain routes will have to come to the business district. Whether the present routes are the ones which should be retained will probably depend largely on developments of the near future.

It is understood that a plan is now under way for a rerouting of the street cars to provide more direct entrances to the business district.

Expressions of the Railway and Bus Managements Regarding Bus Expansion

THE opposing positions of the railway and the bus company's operating organizations are well expressed in the public statements made at the time the matter of additional bus permits was pending before the Board of Public Service. The expressions of opinion in these briefs have such an important bearing on the subject that quotations are given here covering the main points at issue:

The Railway's Position on Bus Permits

EXCERPTS from brief filed with the Board of Public Service on April 30, 1924, by Col. A. T. Perkins, manager for receiver United Railways, in the matter of certain petitions for motorbus permits.

The permits already issued to the People's Motorbus Company cover 19.82 miles of streets; the additional permits asked for 49.54 miles, a total of 69.36 miles. Of these 69.36 miles only 4.89 miles can in any way be deemed to extend the service into new fields and that only for small sections of the proposal routes. These sections are for the most part on streets over which the management of the United Railways has for several years desired to extend its service either by actual street railway construction or by supplementary motorbus service, but which both by reason of the receivership restrictions and the great financial cost involved, it has up to the present time been unable to do.

* * *

Out of the total authorized and proposed mileage, however, no less than 31.95 miles actually cover streets on which car tracks have been constructed under franchises which still have a considerable number of years to run.

The receiver of the United Railways of St. Louis is maintaining service on some 460 miles of line in St. Louis and St. Louis County, day and night, and in all kinds of weather, covering a widely varying volume of traffic. The average number of revenue passengers per car-mile for the entire system for the year 1923 was only 6.41, and of total passengers, including transfers, it was only 9.81. Taking into account the totals, including transfers, the number per car-mile varied on the approximately 40 lines operated from 1.84 per car-mile up to a maximum of 15.55. On not less than 10 lines the traffic is less than five per car-mile. Service has to be maintained at all times and in all weathers, for the benefit of the public generally on all of these lines, no matter whether profitable or unprofitable; and it has been the intention to extend service into additional districts as soon as financial and other arrangements could be made therefor.

The permits issued to the bus company have, on the other hand, been for the purpose of enabling it to cut in, as may be seen from the foregoing figures and from the attached map, to the better part of the business. The operation of buses on Washington Avenue and Grand Avenue has already seriously affected the earnings of many of the better paying street car lines which have to carry the non-paying lines; and these reductions in revenue not only reduce the ability of the United Railways to extend its service, but actually reduce the revenues to the city.

* * *

Outside of reduction in gross revenue due to the business directly taken from the street railways by the buses, the operations of street cars have been and are being seriously interfered with, the service delayed and the expense thereof materially increased by the buses (a) holding or "dragging" the tracks ahead of street cars, (b) stopping in car tracks to load and unload passengers, (c) turning front truck out so as to foul tracks while making their stops, (d) cutting into front of street cars in manner to cause frequent collisions and emergency brake applications, (e) stopping beside street cars in a manner to prevent safe loading and unloading of street car passengers, (f) passing street cars loading and unloading passengers, etc. This situation is causing a seriously increasing delay in moving thousands of street railway passengers to and from their homes and their business, and tending toward a necessity of increased fares.

* * *

As the receiver of the United Railways has not been in a position, on account of legal restrictions imposed by

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court orders, to supply service perhaps really needed on the three stretches of line, totaling 4.89 miles * * *, he cannot object to permits being issued for temporary operation of buses on those stretches, notwithstanding the fact that he has desired to and has made efforts to procure authority to make extensions of his own service over those particular routes. But the receiver believes that this service can be given by a reorganized street railway company to much greater advantage to the public than by a separate motorbus company. The receiver also perhaps should not object to the present permit to the bus line on Lindell Boulevard, provided it were confined to its original route on Lindell Boulevard and Locust Street and not permitted to extend into the congested district on Washington Avenue.

It is further suggested that if permits are to be issued to an independent motorbus company there should in their terms be no discrimination against the millions of street car riders; but that the bus company should be subject to the same tax and street maintenance burdens, and to the same principle of service at cost as the receiver of the railway company.

Attitude of People's Motorbus Company

EXCERPTS from the statement of May 9, 1924, by the People's Motorbus Company of St. Louis to the Board of Public Service in answer to the railway's brief of April 30:

The People's Motorbus Company of St. Louis desires to point out that its service is supplemental, because it gives a character of service not supplied by the railway company—a service of a different class, and at a higher fare * * *. Filling a place somewhere between the street car and the taxicab, the 10-cent bus is a boon to that great body of people of all classes * * * who are unable or unwilling to subject themselves to the discomfort of street car crowding but cannot afford the expense of a private motor car or a public cab. The motorbus has been well termed "the poor man's automobile." While the wage earner may not be able or willing to pay 10 cents for daily travel, it is a sum he will gladly pay to take his family on a Sunday or a holiday for a picnic to Carondelet or Forest Park, as is testified to by the crowds that assemble at the Third Street Bus Terminal on such days. To this class the 10-cent bus line offers the best and cheapest excursion obtainable. Nor does it seem unreasonable that the taxpayer who is willing and able to pay 10 cents to assure himself of a seat should feel himself entitled to that privilege.

Because the People's Motorbus Company, in offering to meet the needs of certain isolated sections of the city, is obliged, in order to reach them, to traverse arterial thoroughfares on which the United Railways has its tracks, this distinctive *supplemental* character of its motorbus service should not be overlooked. * * *

* * *

But the motorbus furnishes something more. * * * The feature of an open-air ride on the upper deck of the bus will prove an important factor in the general health of the city if placed within reach of the people in its various residential localities. It adds a new and valuable form of wholesome recreation that can be availed of in the easiest possible way—notably as an incident to daily travel to and from work. * * *

There are many other ways in which a bus system is of value * * *: First, there is no better way for a visitor to a city to see it than from the top of a bus, and a comprehensive system such as is proposed is a definite asset in giving strangers a pleasant recollection of a city and fostering a desire on their part to return on some other occasion. * * *

* * *

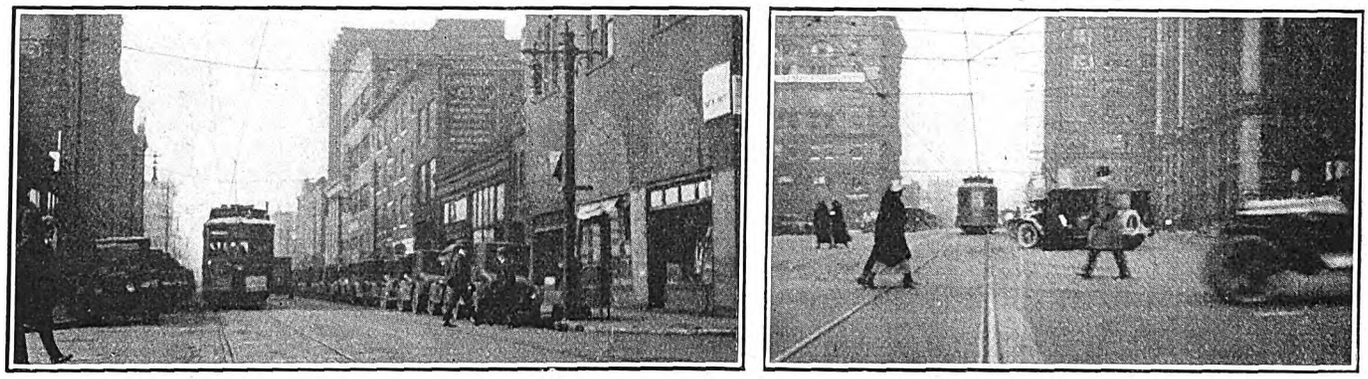
With regard to the paralleling of street car lines, about 11.5 miles of the mileage mentioned is on the routes already in operation and 8 miles on South Broadway and Union Boulevard. The South Broadway route was included in our application at the urgent request of the merchants and manufacturers in that district, who did not consider that the Seventh Street route, proposed by us, would meet their needs. We therefore included both routes, leaving the decision between the two to the judgment of your board. Union Boulevard being the only means of access from the west to the neglected West Walnut Park district (which is not one of those localities recognized by the United Railways as needing attention) it is necessary to use that route in order to reach localities to which access is desired by the West Walnut Park residents, but it is such a broad thoroughfare that, even with a line of cars parked at the curb, the bus service should not cause the least interference with that of the street railway. West Florissant Avenue, which is the only northern and eastern outlet of the West Walnut Park district, is used for about 2 miles alongside the United Railways tracks. This is also a fine, broad thoroughfare and for the most part the tracks are completely segregated from the remainder of the roadway.

In the 8 miles of the Kingshighway route there are 2½ miles of street car tracks, consisting of a block of the Olive-University lines, § mile of the Taylor-Euclid line, and 1⅞ miles of the Southampton line between Vandeventer and Devonshire Avenues. * * * We have indeed sought so to lay out our routes as to avoid, so far as possible, traversing streets occupied by tracks, and have only so routed them where we believed it was essential to the broad public interest. * * *

* * *

* * * The People's Motorbus Company of St. Louis has 72 motorbuses with a maximum carrying capacity of 4,552 persons and, on the present basis of operation, will carry from 13,000,000 to 15,000,000 passengers in the year 1924. Fully half of this bus traffic will be created—in other words, rides that would not be taken were it not for the presence of the motorbus service.

The bus came to St. Louis because it was needed, the lack of adequate transportation facilities being widely recognized. The United Railways' trackage is today substantially the same as it was 20 years ago, while the city and its metropolitan district, from which the street railway traffic is drawn, has forged ahead, as evidenced by every index of growth and activity that may be examined. * * * It is evident that the natural traffic of the street railway, which, cultivated and encouraged, should show a substantial increase year by year, has been steadily alienated by the lack of sufficient increase and improvement of facilities and serv-



At Left—Solid Rows of Automobiles Are Parked on Both Sides of Pine Street Between Tenth and Twelfth. At Right—Angle Parking in the Center of 12th Street Between Locust and Washington Cuts Down Roadway

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ice; that traffic is today being largely carried by the private automobile, with the result that the disposition of the multiplicity of cars that enter the central business district in the mornnig and remain there all day has produced a critical situation that requires drastic treatment. If the parking of cars in the main streets of the business district is to be prohibited, some substitute must be given the people who have acquired this habit, and that substitute, as shown by experience in other cities, can be best supplied in the form of the motorbus with an assured seat.

* * *

The interference by the buses with the street car service of which the United Railways complains is due, almost entirely, to the presence of parked cars along the curb—especially in the district between Twelfth Street and Eads Bridge. In this district it has been practically impossible, during business hours, for a bus to reach the curb to load or unload passengers. Due to careless parking there is seldom sufficient clearance between the cars parked at the curb and the street car track for a bus to run or to stand. With this situation cleared up, as proposed by the Traffic Council, the whole problem will be simplified, and interference with the street railway service should be eliminated and the running time of both services effectively shortened. * * * [Note—Ordinance has since been passed by the City Council and approved.—Ed.]

* * *

As to the suggestion that the motorbuses should be subject to the same taxes and pavement maintenance as the street railway, we submit that any such policy would be grossly unfair. * * * The contention commonly made by street railways that their service does not damage the pavement and that they should, therefore, be relieved of the pavement burden is hardly well taken, as the most casual examination of the paving along the rails of the average street railway line will show. It is eminently proper that this extreme occupation of the public thoroughfare should be compensated for by taxes and paving requirements, while it would be entirely unfair to similarly penalize the motorbus, which involves no element of physical preemption of the public street, and which creates no appreciable damage to a pavement adequate for any heavy commercial traffic. A tax such as is imposed on motorbuses by the city of St. Louis in addition to the license fee is sufficient, if the fund is applied in that manner, to pay interest and debt service annually on an amount of reconstruction that, within a few years, will make St. Louis one of the best-paved cities in the country.

The Railway's Rejoinder

EXCERPTS from the address of Col. A. T. Perkins before the Board of Public Service on July 28, 1924, in the matter of the petition of the People's Motorbus Company for permits on additional routes:

* * * On the other hand, the motorbus company operates simply under temporary permits issued by the Board of Public Service, based on provisions of Ordinance 30911, is owned primarily and controlled in Chicago, with only nominal headquarters in St. Louis, making public simply its gross receipts in its quarterly reports to the city, and is under no obligation to and is without the jurisdiction of the Public Service Commission.

Whatever the validity of the present permits under which it operates, I shall beg the liberty later of arguing that under no circumstances can the agreements or even general understandings under which the permanency of these bus lines has been asked for by your honorable body and promised by the motorbus company be legal under the terms of Ordinance 30911.

* * *

Now, frankly, it seems to me that the continuance of this policy of issuing bus line permits will have certain very serious consequences both during and at the close of the receivership.

First—During receivership, the issuance of these permits will make necessary either

1. An increase in street car fare affecting fully 90 per cent of the traveling public, and
2. A material reduction in service, or
3. A material reduction in wages, and
4. The loss of regular runs by a considerable number of motormen and conductors, and reduction in number of other employees.

* * *

As I have stated repeatedly in the past and in my brief of April 30, 1924, I realize the urgency of extensions of service into certain districts now not supplied by service; and near as we believe a reorganization of the United Railways to be we cannot insist that such an extension of service should necessarily wait even on the reorganization, but we thoroughly believe that all this service should be a co-ordinated service between the street railways and the buses. For example, I believe, as I stated to your honorable body fully two years ago, that a bus system should be put in to take care of the Lindenwood District, which I understand to be at present the most pressing case before your body. I therefore propose that, subject to permission of the U. S. Court and the Missouri Public Service Commission, which I believe can be obtained, a permit be issued to the bus company for service beginning at Wood Street, where transfers should be made to and from the Tower Grove line street cars and looping through Lindenwood. The 10-cent fare in that district within the city limits to cover transfer to the street railways, and the street railway fare plus 3 cents to cover transfer to the buses. This would make for a very large proportion of the people to their destinations a 10-cent fare instead of a 17-cent fare; as in a considerable proportion of cases they would have to use the street cars anyway. The division of this 10-cent fare as between the United Railways and the buses in this case we should be willing to leave to the decision of the Missouri Public Service Commission.

* * *

If this arrangement is not acceptable to the motorbus company, I have been authorized by certain parties interested in the reorganization of the United Railways to say that a separate bus company will be immediately formed to provide this supplemental service with transfers for the 10-cent rate to and from the street railway cars, under the direction of your honorable body, and that this new company will be prepared to make further extensions of such service as needed. The parties in question are prepared to have a sufficient number of buses in operation within 90 days.

Large Single-Phase Locomotives

THE Loetschberg Railway has just placed an order with the Société Anonyme des Ateliers de Sécheron, Geneva, Switzerland, for two large single-phase locomotives. Each of these engines is to be rated at 4,200 hp. on the 1-hour basis. More powerful engines are, of course, being built in America, but these locomotives will be equipped with phase converters for changing the single-phase current collected from the overhead wire into polyphase current. The new Swiss locomotives are to be used for freight and passenger traffic, and will be employed more particularly on the heavy grade division of the railway, between Frutigen and Kandersteg.

The engines are to be designed for a normal speed of 31 m.p.h., and a maximum speed of 43.8 m.p.h., the load on each driving axle being 19 tons. Trains weighing 560 tons, excluding the weight of the locomotive, will be hauled on a gradient of 2.7 per cent at a speed of 31 m.p.h. The locomotives will be of the 2-6-6-2 type with six twin motors, each capable of developing 700 hp. for 1 hour, thus giving a total output of 4,200 hp. Power will be transmitted to the driving wheels by means of an individual drive of the Sécheron type. Oil immersed transformers are to be used for reducing the line pressure and for supplying a variable voltage to the driving motors, which will be controlled by means of electro-pneumatic contactors, the arrangement being the same as that adopted on the single-phase

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locomotives built at the Sécheron works for the Swiss Federal Railways.

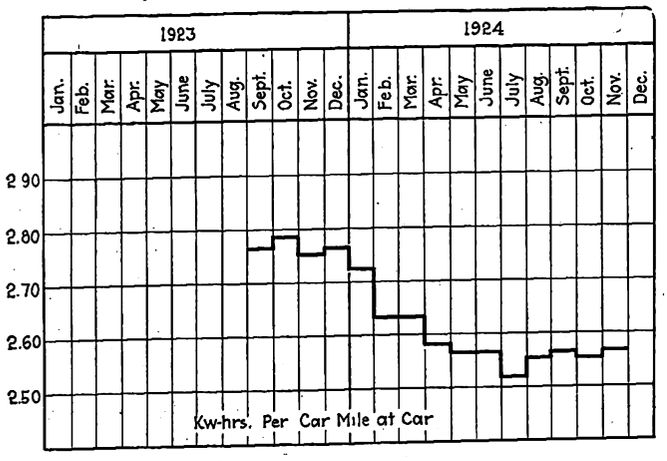
The principal dimensions, weights, and capacities of these new engines are as follows:

Length over buffers	66 ft. 3½ in.
Diameter of driving wheels	53.1 in.
Number of twin motors	Six
One-hour rating measured at the rim, at a speed of 31 m.p.h.	4,200 hp.
Tractive effort measured at the wheel rim, 1-hour rating	22.6 tons
Tractive effort at starting	34 tons
Total weight of the mechanical parts	67 tons
Weight of electrical parts, including individual axle drive	68.5 tons
Total weight in service	135.5 tons
Adhesive weight	114 tons
Maximum speed	43.8 m.p.h.
Line voltage	15,000 volts
Frequency	16 2/3 cycles per second

Power-Saving Chart Stimulates Interest

Each Man's Record on Denver Tramway Is Shown in Comparison with Average for His Time, so as to Stimulate Individual Interest in Saving Energy

FOR stimulating interest on the part of its motormen in energy saving an interesting form of chart is used by the Denver Tramway Company. This is made up as a semi-monthly report, which shows the standing of each motorman with reference to the average power consumption per car-mile during that period on the line on which he operates. It is posted where it may be seen by all motormen in each division.



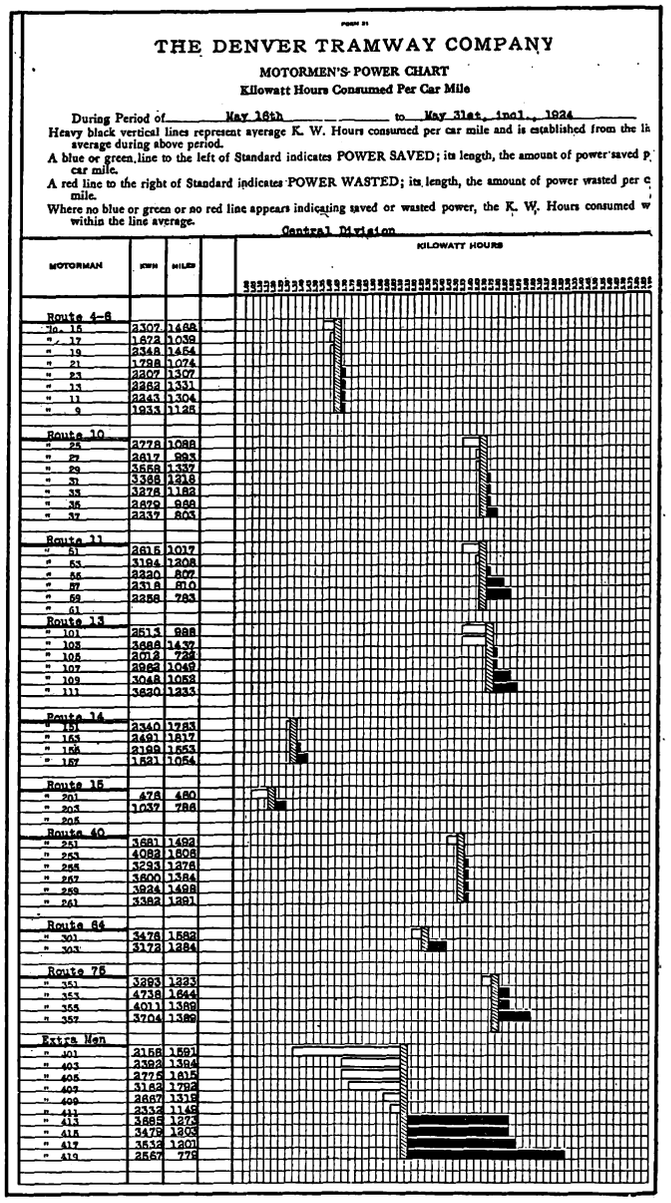
Results Accomplished by Attention to Power Saving Are Shown by This 15-Month Graphic Record of the Denver Tramway

This chart has been adopted from a similar idea originally developed in San Diego. The cross-hatched vertical line indicates the average energy consumption per car-mile for each line on the system. Individual motormen's records are shown by horizontal lines extending either to the left or right of the average. Lines to the left, drawn in green, indicate the records of men whose consumption during the month is less than the line average, while those higher than the average are drawn to the right in red.

As the average for each line on the property varies from period to period, the cross-hatched line will change accordingly. The purpose of the chart is to stimulate those men whose records appear on the right of the average line to improve their performance. As this occurs, the average on the chart for that line moves toward the left, and inspires those men whose records are still posted in red to increase effort to save power. The men with records in green must continue to improve as their power consumption approaches the average.

An explanation at the top of the chart gives the meaning of the different colored lines. In the first column at the left appear the various route numbers, together with the run numbers of individual motormen. In the next two columns are the kilowatt-hours used for the period covered by the report and the total miles operated, respectively. The remaining space is cross-ruled to facilitate plotting the chart according to the scale of kilowatt-hours at the top. From the figures given in the columns headed "Kilowatt-Hours" and "Miles" at the left, each man may readily check his own performance to insure that the curve for his record is shown in the proper position.

The net result accomplished by this form of chart in connection with Economy meters for inspiring interest in power-saving results is strikingly illustrated in the summary curve in an accompanying illustration which shows a decided reduction in kilowatt-hours per car-mile in a period of 15 months.


THE DENVER TRAMWAY COMPANY

MOTORMEN'S POWER CHART

Kilowatt Hours Consumed Per Car Mile

During Period of May 16th to May 31st, incl., 1924

Heavy black vertical lines represent average K. W. Hours consumed per car mile and is established from the la average during above period.

A blue or green line to the left of Standard indicates POWER SAVED; its length, the amount of power saved p car mile.

A red line to the right of Standard indicates POWER WASTED; its length, the amount of power wasted per c mile.

Where no blue or green or no red line appears indicating saved or wasted power, the K. W. Hours consumed w within the line average.

Central Division

MOTORMAN	KWH	MILES
Route 4-6		
No. 16	2307	1468
" 17	1672	1039
" 19	2348	1454
" 21	1798	1074
" 23	2207	1307
" 13	2262	1331
" 11	2243	1304
" 9	1933	1125
Route 10		
" 25	2778	1088
" 27	2617	993
" 29	3658	1337
" 31	3368	1218
" 33	3276	1182
" 35	2879	966
" 37	2337	803
Route 11		
" 51	2615	1017
" 53	3194	1208
" 55	2220	807
" 57	2318	810
" 59	2256	783
" 61		
Route 13		
" 101	2513	988
" 103	3686	1437
" 105	2012	728
" 107	2962	1049
" 109	3048	1082
" 111	3620	1233
Route 14		
" 151	2340	1783
" 153	2491	1817
" 155	2188	1553
" 157	1521	1054
Route 15		
" 201	478	480
" 203	1037	786
" 205		
Route 40		
" 251	3681	1492
" 253	4082	1808
" 255	3293	1376
" 257	3800	1384
" 259	3024	1498
" 261	3382	1391
Route 64		
" 301	3478	1582
" 303	3178	1284
Route 75		
" 351	3293	1323
" 353	4738	1644
" 355	4011	1389
" 357	3704	1389
Extra Men		
" 401	3158	1591
" 403	2392	1384
" 405	2775	1615
" 407	3183	1782
" 409	2867	1319
" 411	2352	1149
" 413	3885	1273
" 415	3479	1303
" 417	3538	1201
" 419	2567	778

The Heavy Vertical Lines on the Chart Indicate the Average Energy Consumption for Each Car Line

Individual motormen's records are shown by the horizontal lines. Those to the right indicate records above the average and those to the left show men below the line average.

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Subway Proposed in Pittsburgh

Engineers of Bureau of Traffic Relief Find Pittsburgh Needs Limited Subway—To Be Used at First by Surface Lines, but to Form Part of System Later for Train Operation—Co-ordinated Service with City Surface Railways Recommended at All Times

ACTING for the Bureau of Traffic Relief of the city of Pittsburgh, Daniel L. Turner, consulting engineer, and Winters Haydock, chief engineer of the bureau, have been studying the causes of street congestion in the downtown streets of Pittsburgh and the extent of relief which might be given by a subway. The study is being conducted because of an ordinance, ratified in July, 1919, by popular vote, authorizing the expenditure of $6,000,000 for providing a subway in the first and second wards of the city, adapted to the use of either surface cars or high-speed trains or both.

The conclusion of the engineers, as shown in a progress report just rendered, is in favor of a limited amount of subway construction, to be operated in connection with the local street railway system and to be used at first by surface cars, which would thus be removed from the streets above. A feature of the proposed subway is the combination with the construction in the downtown streets of sub-surface sidewalks to take part of the pedestrian traffic off the street. The report lays great stress on the assistance which such a subway would give in spreading the business district over a greater area. When the needs of the city require it, this subway can be extended. The engineers think very definitely that the needs of Pittsburgh at present do not require an extensive subway system. An abstract of the report follows:

Pittsburgh Triangle District

The principal office and business district of Pittsburgh is in a triangle between the Allegheny and Monongahela Rivers. Approximately two-thirds of all the street car transportation in the city now centers in this triangle, and between 6 a.m. and midnight the street cars bring in and take out of the triangle approximately 355,000 passengers. Of the 1,431 buildings in this territory, 48 are from 10 to 26 stories in height, and every new 21-story building adds approximately 1.28 per cent to the working population in this restricted area.

The street system in this area is inadequate now and is becoming increasingly less adequate. A third of the streets in this business district are only 40 ft. wide and most of the remaining streets 60 ft. wide. Moreover, they are badly articulated. Alleviation can come in three ways: (1) Spreading the district, (2) restricting the use of the streets for some of all classes of traffic, or (3) securing more efficient use of existing street space. The first and last of these plans are obtained by a subway through the district and under the Allegheny River, where the only possibility for expansion exists, and where there is a district capable of being developed for business purposes over three times as large as the triangle district. This is shown in the accompanying diagram.

Additional street capacity in the triangle will be obtained if all rail transportation and some pedestrian use of the streets are removed from the surface to underground. While the automobile is chiefly responsible for the traffic congestion in the triangle, street car movement in the congested area is relatively slow. It is simpler to remove the cars from the streets and provide them with exclusive rights-of-way below ground than to do so with any other kind of vehicular traffic.

Street Car and Rapid Transit Subways

In general, there are serious objections to street car subways, one being that the passenger traffic capacity of street cars operated in a subway is only about half of that of a rapid transit train service in a subway. For example, 180 cars per hour in each direction represents about the maximum street car operation of a subway; whereas a rapid transit service of 35 ten-car trains, or 350 cars per hour, can be operated in the same subway, and the subway cars will carry more passengers per car. For this reason, such a subway as that contemplated, if street cars are to be operated in it at first, should be located, planned and constructed so it will eventually form a component part of a rapid

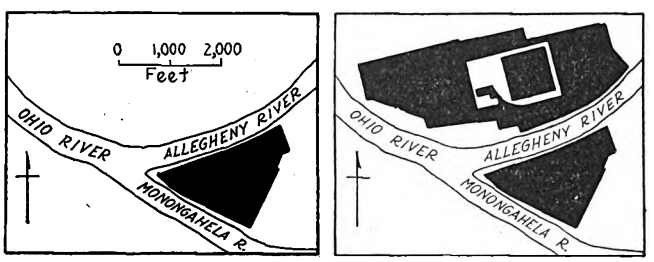

Diagram Showing Possible Increase of Central Business District of Pittsburgh. At Left, Present Area. At Right, Possible Area

transit system, whenever such a system may be inaugurated in the future.

The chief functions of a rapid transit system are to furnish (1) high speed, long-distance service, or (2) mass transportation by means of train operation, or (3) high-speed and mass transportation combined. Another function that a rapid transit line (not a system of lines) may perform to advantage where suitable conditions prevail is as a high-speed connecting link between two widely separated community centers.

Below is a table showing the travel range for the several modes of transportation now chiefly available for local transit:

TABLE SHOWING SPEEDS OF DIFFERENT TRANSPORTATION MEDIA AND AREAS SERVED

	Foot Travel	Street Car or Motor Bus	Local Service Rapid Transit
Speed in miles per hour	2½	8	16
Ratios of above	1	3.2	6.4
Radius of travel from center	1.6	5	10
Ratios of above	1	3.2	6.4
Approximate circular area served in square miles	8	80	320
Ratios of above	1	10	40

The table is based on the assumption that the maximum total travel time desirable, including walks at each end of the line, should approximate three-quarters of an hour. It indicates generally that one can travel

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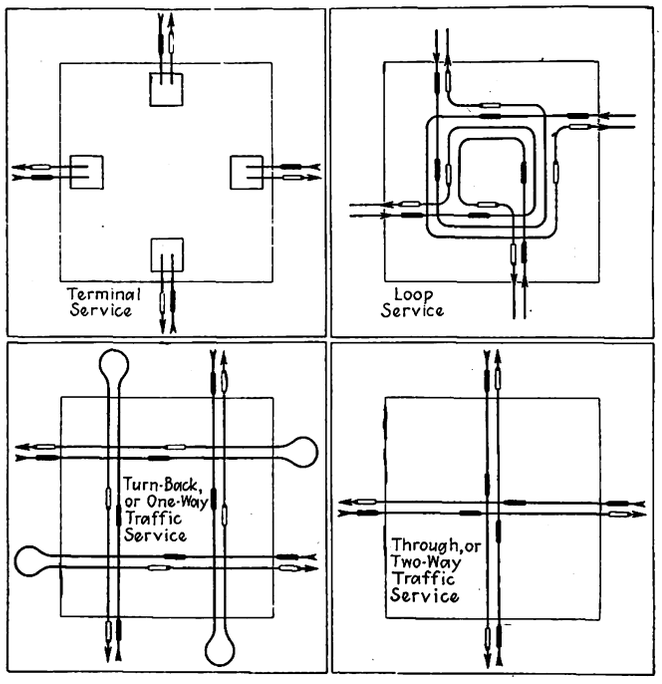


Four Ways by Which a Hypothetical Business District Can Be Served with Transportation

twice as far on a rapid transit line as on a street car or motor bus in a given time, and 6.4 times as far as one can walk in the same time. It also shows that the trolley car or motor bus adequately serves the city included within a 5-mile circle from the center and (if a circular city) having an area of about 80 square miles. Similarly, a rapid transit local service, with stations about a half mile apart, will serve a 10-mile radius city, having an area of 320 square miles.

The proposed expansion of the triangle district to the north side of the Allegheny River cannot be accomplished by setting a new area apart and designating it as belonging to the central business district. This will not insure its development and use as such by the public. It must be made conveniently accessible to the whole city. The circulating and distributing systems of the city—the street system and the transportation system—must serve this new business area just as conveniently as they now serve or will serve the triangle area itself. When this is effected, then and then only will the business district automatically break through its encircling barriers and spread across the river to the north as the development of business makes it necessary.

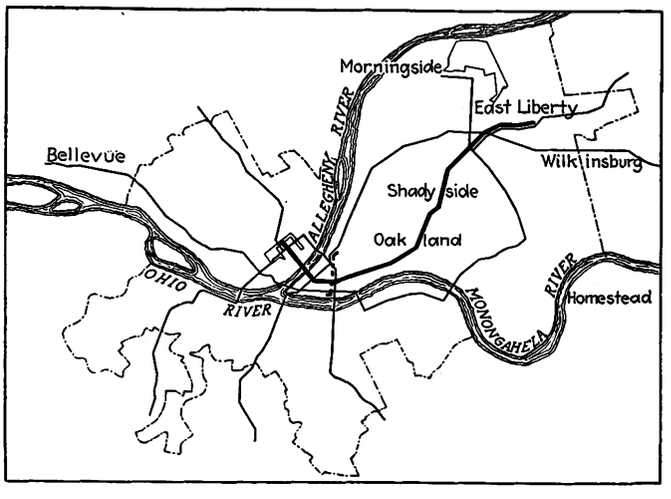
TRANSIT METHODS OF SERVING A CENTRAL BUSINESS DISTRICT

There are four methods of serving any central business district. They are illustrated in the accompanying diagram as follows: (1) Terminal service, (2) loop service, (3) turn-back or one-way traffic service, (4) through or two-way traffic service. The central area is assumed to be ½ mile square.

From a municipal transit standpoint, there are nothing but disadvantages in the first service shown, namely, terminal service. It does not furnish any through service. It does not distribute any traffic within the central area. Instead, it unloads it on the edges and requires it to use other facilities or to walk to its destination. It does not provide for any circulation or distribution of the traffic from the standpoint of the city as a whole. One cannot ride from one side of the city across the central area to and through the opposite side without changing cars twice and using two terminals. From the municipal transit standpoint, it is the worst kind of service that can be supplied to a city.

The loop service, illustrated in the second illustration, differs from a terminal service in that it distributes its traffic around the area in which it circulates instead of unloading it at the edges. Although it does not provide a direct through service, one can travel through by transferring from one line to the other in the loop. In these two respects, it is superior to a terminal service. But these slight advantages are more than offset by the evils that result from a loop. It will induce, facilitate and crystallize congestion within and directly adjacent to the areas circumscribed by the route. This is where high buildings will concentrate, and to which all kinds of business efforts will be attracted. As a result, this is where the pedestrian and vehicular congestion will become most intense.

Besides producing these objectionable conditions of congestion, a loop service will require the maximum amount of facilities to furnish a given transit capacity into and out of the central area. Every track entering the area will traverse it on all four sides. This means that 16 tracks will be necessary in the central area to develop the full capacity of the four tracks entering from the four quarters around the area. Entering in the morning rush hours, the train will be fully loaded as it starts on its trip around the loop. It will gradually unload until it becomes empty as it leaves the loop and starts on its outward trip. For a large proportion of the trip around the loop, the train is traveling empty. This means a wasteful use of trackage. Since all trains will travel in only one direction around the loop, a great many passengers workward bound in the morning will have to travel practically all around the loop and consequently circle all around in the central area before arriving at their destination. Similarly, at night a great many homeward bound passengers, after boarding the trains, will have to circle all around in the central area before they can start on their outward journey. Therefore, because it creates and crystallizes congestion, because it does not furnish a direct through service, and because it requires the maximum facilities to accommodate a given traffic capacity, a loop service from the community interest standpoint is wholly wrong in



The Metropolitan District of Pittsburgh

The heavy solid line shows the recommended subway in the triangle district, with possible extension to East Liberty. The dotted line shows the suggested second north and south subway in the business district. The light solid lines show the suggested routes for a rapid transit system for the metropolitan district of Pittsburgh.

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principle and should not be utilized in a city transit plan.

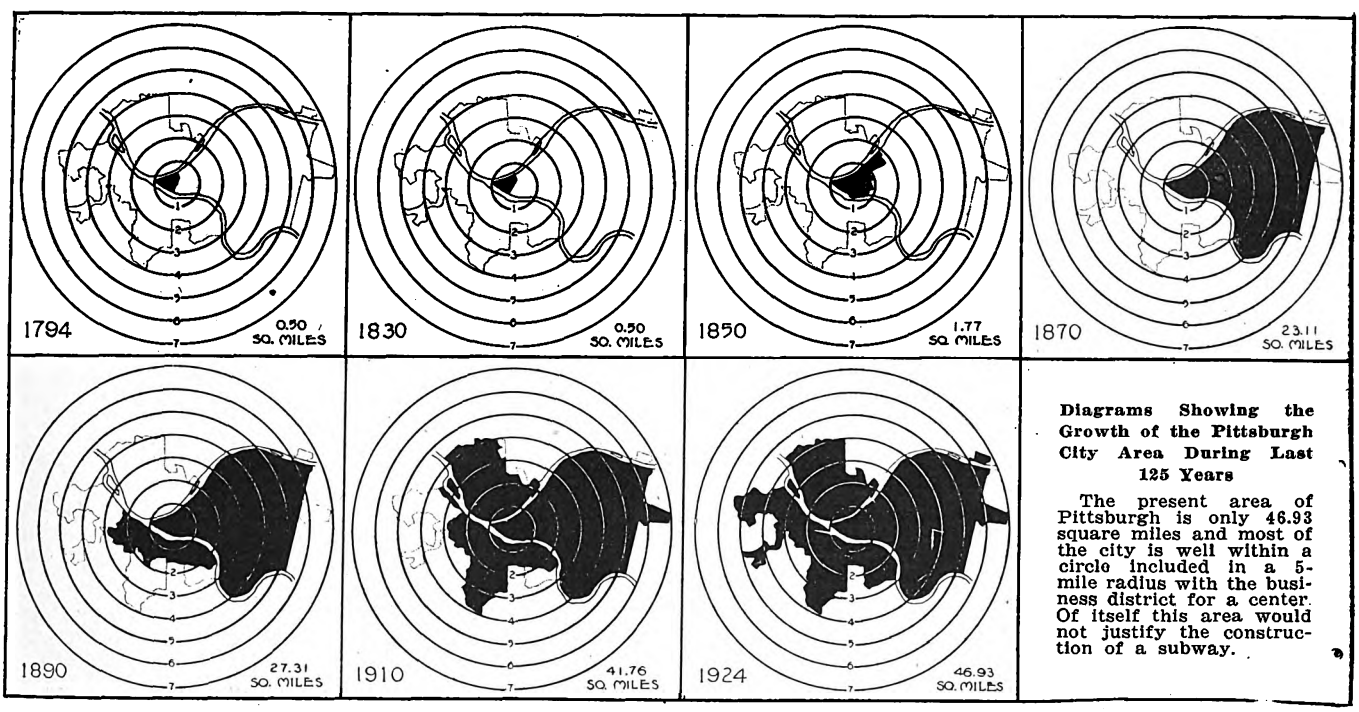
The turn-back, or one-way traffic service, shown in the third illustration, more nearly approaches the proper service, but it has some disadvantages. It furnishes a direct through service through the central business district, but after that area has been passed, the train is switched back and journeys through the central area on its outward journey to the point of origin. As the center expands, the turn-back point for the train (on the side opposite to the entrance point) can be moved outward, and this process can be continued indefinitely. Therefore, such a service does not induce congestion but permits the central business district to spread out as business develops. For this reason, a one-way traffic service is greatly superior to either a terminal or loop service. But there is a drawback from the service standpoint. One cannot cross one quarter of the city to the opposite quarter without changing cars. Four separate lines are necessary to serve the four opposite quarters. This means eight tracks traversing the central area. In the morning rush hour, the trains enter the center fully loaded, but return in the opposite direction empty. Thus, only four tracks accommodate loaded trains, the other four being used by empty trains. During the evening rush hour there are similar conditions except that the movement is in the opposite direction. Therefore, this system should not be used except as a temporary expedient.

The through or two-way traffic service, shown in the fourth illustration, is more nearly the ideal transit service for a city. It furnishes a complete and direct through service without change of cars. It encourages the spreading out of the business center and a diffusion of the population over the whole city. It furnishes direct and convenient service not only all the way through the present business center, but the same service is furnished to the new business center as it expands and spreads out in response to the growth of business and the necessity of overcoming the physical limitations of the old area. Such a line means only one track through the center to furnish exactly the same capacity as two tracks on a one-way traffic line. Each track traversing the center on a two-way traffic line is utilized by loaded trains during each rush hour. It therefore utilizes the line to 100 per cent capacity and efficiency for loaded trains.

The routing principle described as related to rapid transit does not apply to surface car operation to the same degree because of factors in surface car operation that do not obtain in the case of rapid transit.

Rapid Transit System Not Yet Needed

While a comprehensive rapid transit system for the metropolitan district of Pittsburgh is indicated in the accompanying map, such a system is not required under present conditions. The diagram showing the area of Pittsburgh shows that most of the city is now within a 5-mile radius of the city-county buildings. Only a very small area on the eastern boundary extends out as far as 7 miles. The area of Pittsburgh is now only 46.9 square miles. As already pointed out, a 5-mile radius city with a circular area of 80 square miles does not require anything but trolley car or motor bus transportation for adequate service. Obviously, then, Pittsburgh with only a little over half of the area of a fully developed 5-mile radius city (46.9 as compared with 80 square miles) cannot justify the inauguration of a rapid transit system at the present time.



Diagrams Showing the Growth of the Pittsburgh City Area During Last 125 Years

The present area of Pittsburgh is only 46.93 square miles and most of the city is well within a circle included in a 5-mile radius with the business district for a center. Of itself this area would not justify the construction of a subway.

The charts of area and population growth of the city show the city had an area of 23.11 square miles in 1870, and that its area has only doubled in 54 years. In other words, the rate of expansion of the city in the past does not justify the expectation of any material expansion beyond the existing 5-mile radius at a very early date. No rapid population increase (except by annexation) seems in prospect. Pittsburgh has now a population of about 626,000, and a reasonable estimate appears to indicate that in 1940 the population of the city may be about 780,000 and in 1950 may approximate 900,000. These figures do not indicate the likelihood of a very dense population. Moreover, the topographical condition, owing to the fact that there are very few

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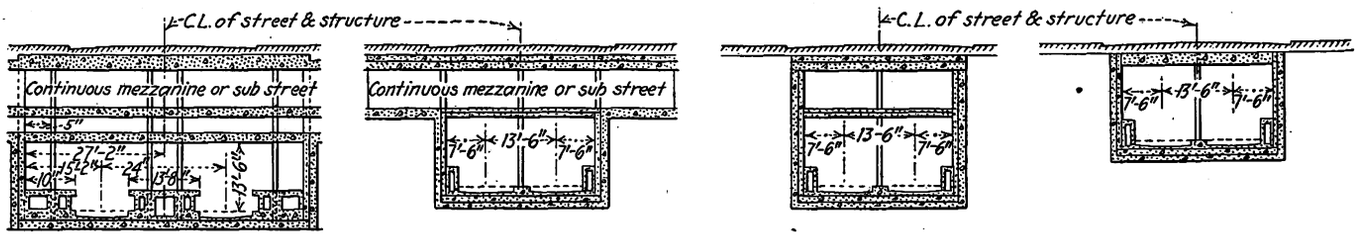
level spaces of any considerable area upon which a large population can obtain foothold, preclude the idea of a dense population. These statements refer to the city alone and not to the metropolitan area.

A metropolitan system of rapid transit lines will probably be required long before the city itself will need such a system to serve itself alone. Legislation that will create the machinery necessary to develop and carry out a metropolitan rapid transit plan cannot be obtained too soon. Such a metropolitan plan can utilize the surface type of rapid transit line to the utmost extent possible, thereby enabling approximately 5 miles of surface rapid transit lines to be constructed through the metropolitan area for the cost of 1 mile of subway line in the center of the city. The metropolitan district machinery is needed as early as possible to permit the rights-of-way necessary for surface rapid transit lines to be acquired before land values become too great and therefore prohibitive.

Proposed Initial Rapid Transit Line

Pittsburgh now needs and should construct an initial rapid transit line. That recommended is shown by the solid line in the accompanying map. It will be about 7 miles long and will be served by 17 stations. It should be a two-track subway line throughout, and a subway in the sense that it will be an underground line. The under-river section will be a tunnel, as will be also some other short sections where the topography makes such construction desirable.



Various Sections of Subway with Two Tracks Suggested in Report. An Imporant Feature Is the Mezzanine or Sub-Street for Pedestrians

It is proposed that the street car system shall be rerouted, where practicable, so as to act as a collecting and distributing system for this rapid transit trunk line. This will permit the street car lines to be abandoned where they operate on the same streets traversed by the rapid transit line. These changes in street car operation presuppose that the rapid transit line and the street car system will be operated as a unit. The first section of the subway to be constructed should be part of the Fifth Avenue line included within the limits of the first and second wards. At the two ends of this short downtown section, temporary portal approaches can be constructed for the use of the street cars, as long as the subway is used as a street car subway.

Gradually, as the growth of the city warrants it, this line can be expanded into a system of lines.

The Subway as a Sub-Street

In this downtown section, the recommended subway will be unusual in one respect, as shown in the sectional illustrations. It will be served with a continuous underground mezzanine platform extending across the entire width of the street and very nearly for its entire length. To this sub-street there will be entrances and exits as frequently as abutting building owners desire to have them. At least they will be provided at every cross-street. This means that the passengers may enter and leave the sub-street, and hence the subway, at every building and cross-street, just as one does now in the case of surface streets. It will also mean, as far as pedestrians are concerned, that the grades will be separated, so that pedestrians will no longer have to cross the street on the surface in the face of vehicular traffic, nor will they have to cross on the surface to reach the subway station.

Directly over each station, where the depth is sufficient, and as close to the station platforms as clearances will permit, there will be a station mezzanine below the level of the sub-street. That is to say, at the stations, where they are deep enough, the subway will have three underground levels—the sub-street, the station mezzanine, and the station platform.

Another advantageous feature included in the subway design is the use by two tracks of three platforms, two side platforms to be used for loading and a center platform for unloading. In this way, the incoming and outgoing traffic streams will be separated. The approximate cost for the subway in the first and second wards only is $6,950,000.

The construction of the proposed downtown section would permit the removal from service of street cars except those running in the north and south direction. The construction of the north and south subway would care for these cars, and, as explained, they would enter the subway at the triangle.

The second section of subway proposed is that shown by the dotted line on the map.

Methods of Financing

Three financial plans are available: Private capital can be called on to provide all of the necessary funds or at least to assist in financing the enterprise; city credit can be utilized by issuing bonds; or an assessment plan for raising the money can be developed.

If private capital is called upon to assist in the financing, it would logically mean that the Pittsburgh Railways Company should furnish it, because it is the natural operator of such a line, for the reason that the city can be served best by a unified transit system under which the rapid transit line and the street car facilities are co-ordinated. But before starting the construction of a rapid transit line to be financed on this basis, the city and the company must agree upon the form of contract to be entered into between them covering all the details of financing, constructing, equipping and operating the joint system.

If city credit is used, it presupposes, just as in the case of private capital financing, that the rider must pay a fare high enough to meet the interest and amortization charges on the total capital outlay, as well as to meet all operating expenses.

The third plan proposes an assessment of part of the cost on the owners of the property benefited. The assessment should be such that the gain from them, combined with the riders' fare, will pay for the cost

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of the line and the service on it, thereby avoiding the use of private capital or city credit for the purpose.

Undoubtedly, the value of the property abutting the proposed line on Fifth Avenue will be increased by its construction. Interested land owners and prospective land buyers should take these matters into account. Under the plan proposed, the owner may have to give up some of his benefit to the city in the form of assessments. Likewise, the buyer of a prospective benefit may leave all of the benefits to the seller and pay an assessment instead, without receiving any additional benefits commensurate with his later assessments. For these reasons, it is undesirable to announce rapid transit routes until an assured plan of financing their construction has been developed. It causes what may later prove to be unjustifiable real estate speculation along the proposed routes, in case the project falls through. In this case, there is no alternative at the start, because the policy of financing the subway in the first and second wards, at the cost of the city, was determined when the bond issue was voted by the people. Later subways should be financed under an assessment plan.

On the Older Buses White Numbers Painted on a Metal Background Indicate the Route

Route Numbers for Bus Lines

Public Service Company Adopts System of Numbering Routes as an Aid to Its Patrons—Similar System May Be Adopted for Car Lines

ONE of the interesting developments which has followed the taking over by the Public Service Railway, Newark, N. J., of more than 500 independent buses has been the adoption of a system of route numbers. Originally the independent buses indicated the route on which they were running in whatever manner best suited the individual owners. Later, however, various color schemes were adopted for the different routes and a good many of the buses were painted in conformity with this plan. Thus the prospective passenger could distinguish his bus by its color.

After the railway took over these buses, however, it repainted them a uniform color. For this purpose the same yellow which has been used for many years on its railway cars has been adopted. The distinguishing characteristic of the buses on the different lines having been thus eliminated, a new way to accomplish this result had to be devised. This has been done by the use of route numbers which are displayed prominently on the front and side of the vehicle as shown in the accompanying illustration. On the older buses a white number is painted on a piece of metal fastened to the roof. On the side of the bus another metal sign gives the route number and destination. On the newer buses this information is displayed on roller signs.

Only even numbers are used to designate the bus routes. The adoption of route numbers for the car lines is under consideration, and it is planned to use the odd numbers for this purpose. In cases where a car line and a bus line serve the same general territory, consecutive route numbers will be used.

Route Numbers and Destinations Are Displayed on Roller Signs on Newest Public Service Buses

Modern Ferryboats Part of Oakland Company's Equipment

TWO new ferryboats are to be built for the Key System Transit Company to make the run between San Francisco and Oakland, Cal. The cost of each will be about $500,000 and they will be constructed in a San Francisco Bay shipyard. Edward McCauley, San Francisco, has been retained to design the two all-steel steamers, each 275 ft. long and of 70 ft. beam to accommodate 4,500 passengers.

When the new boats are completed the Key System Transit Company will have a fleet of four modern ferryboats. Two others, the *San Leandro* and the *Hayward,* built in a Los Angeles yard about a year ago, are now in commission. It is necessary, however, that the new craft be put into service as soon as possible, as traffic is increasing rapidly and there is much overcrowding now during the rush-hour periods.

Ben H. Allen, director of public relations, says that the new boats will be started just as soon as plans have been accepted and contracts let and that they will be the fastest, most comfortable and most up-to-date ferryboats on San Francisco Bay. They will have turbo-electric drive.

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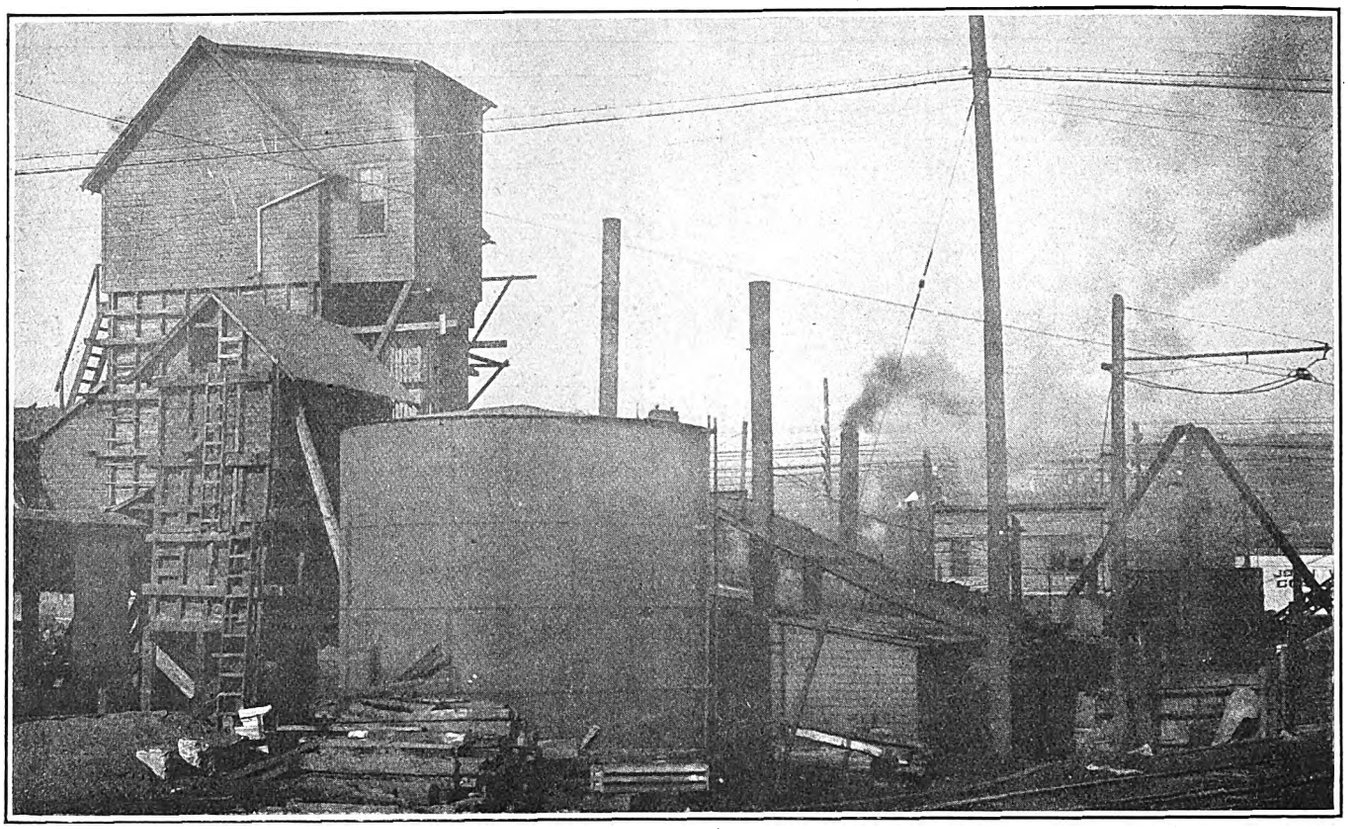
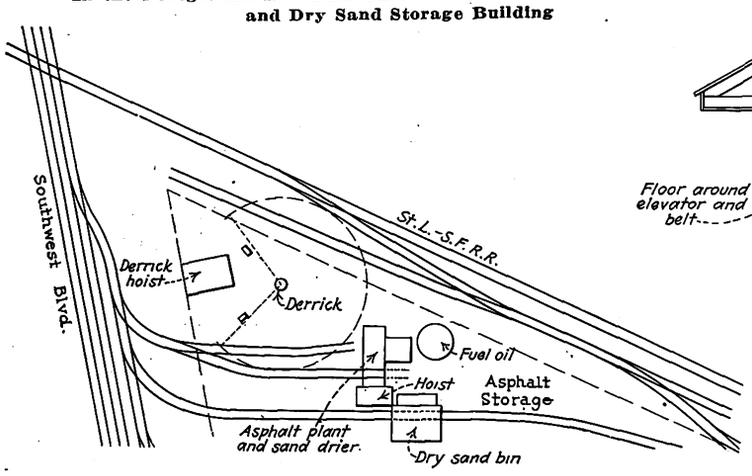
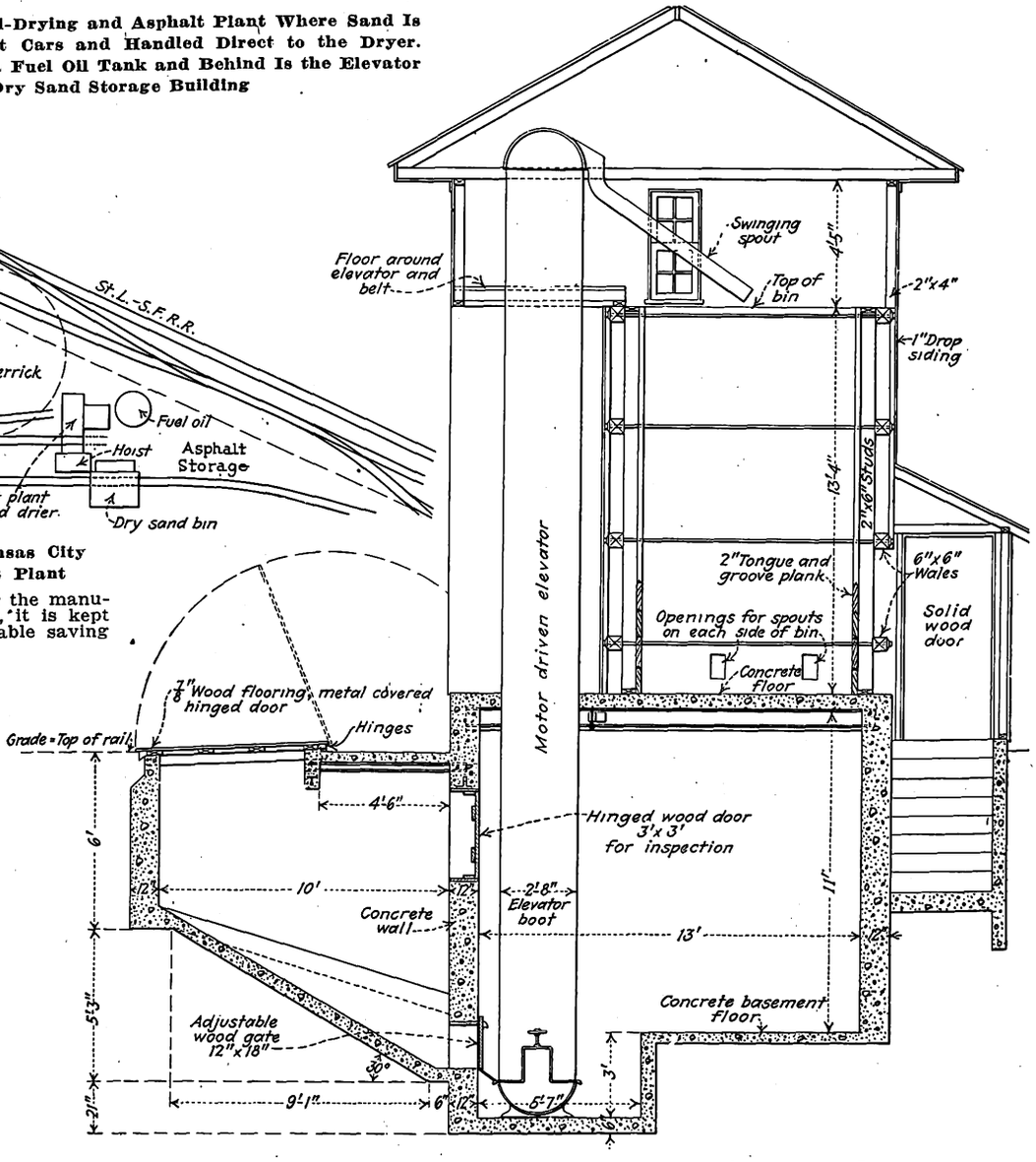


Above—Combined Sand-Drying and Asphalt Plant Where Sand Is Unloaded from Freight Cars and Handled Direct to the Dryer. In the Foreground Is a Fuel Oil Tank and Behind Is the Elevator and Dry Sand Storage Building



Above—Arrangement of Kansas City Sand-Drying and Asphalt Plant

By using the same plant for the manufacture of asphalt, in summer, it is kept busy all year and an appreciable saving is made.



At Right—A Modern Elevated Storage Bin at this Carhouse Reduces the Cost of Handling Dry Sand from 60 Cents to 10 Cents per Cubic Yard

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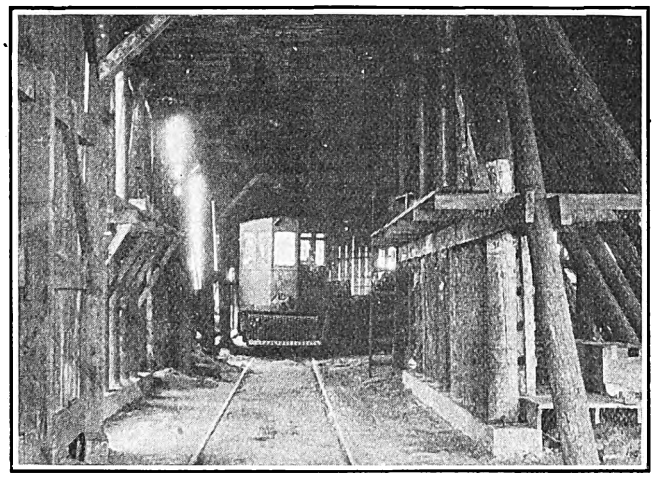
Modern Sand Dryer in Kansas City

Combined Plant to Manufacture Asphalt in Summer and Dry Sand in Winter Proves Economical—Large Quantities of Sand Used Because of Many Hills—Elevated Bin Reduces Handling Cost

DUE to the extremely hilly conditions in Kansas City, a comparatively large quantity of dry sand is required to keep the rails in safe condition, and the drying and handling of this material is an important operating item. From 6,000 to 7,000 cu.yd. of dry sand are used per year. This is distributed to the rail from the sand boxes of regular cars, and also by special sanding cars operated for this purpose only during bad weather.



Dry Sand Is Loaded by Gravity Directly from the Overhead Storage Bins to Work Cars for Distribution to Carhouses

The operation of drying sand in winter has been combined with that of manufacturing asphalt in summer, through the use of a 15-yd. per hour Hetherington burner asphalt plant for this double purpose. Wet sand is delivered on a railroad switch track to the drying plant, and is unloaded from the freight cars with a clamshell bucket and stiff-leg derrick. This derrick is arranged so that it can handle material through almost a complete circle. In this way one piece of equipment unloads sand from the cars to the storage pile and also handles the material from the pile to the wet sand hopper at the dryer. The general arrangement of the plant is shown in the accompanying illustrations.

Dry Sand Stored Overhead

From the drying drum, the sand is discharged to an inclosed hoist which elevates it to overhead storage bins in the dry sand house. This is so arranged that work cars in which the dry sand is distributed to carhouses are run directly under the bins, as shown in an accompanying illustration, and are loaded by gravity. Special sanding cars for distribution of sand directly to the rail are also loaded at this plant.

The cost of drying sand is 60 cents per cubic yard. This includes the total cost of handling during the drying operation, until the dry sand is stored in the overhead hoppers at the plant.

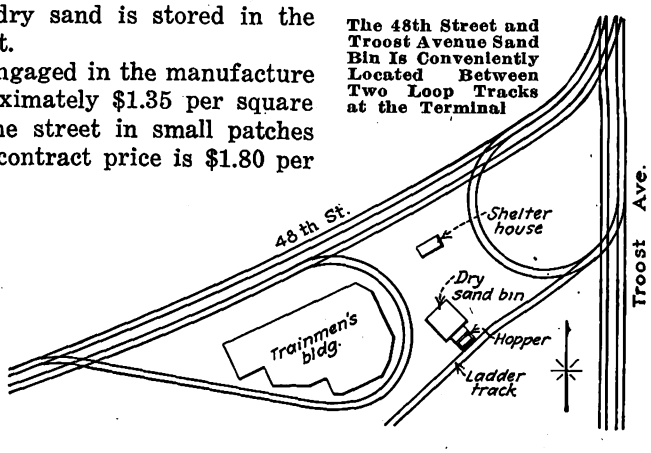
When the drying plant is engaged in the manufacture of asphalt, the cost is approximately $1.35 per square yard for material laid on the street in small patches 2 in. thick. The prevailing contract price is $1.80 per square yard, for the same thickness of material, but this price applies to resurfacing in extended areas and would probably be considerably higher for small lots. Combining the sand drying and asphalt manufacture, therefore, provides an efficient plant for drying the large quantities of sand required, and also makes a considerable saving in the cost of asphalt for paving maintenance.

When the sand is handled from the dryer to carhouses in work cars and is shoveled by hand to carhouse storage boxes or bins, an additional handling cost of 60 cents per cubic yard is entailed. At the 48th and Troost Street carhouse, a modern sand-elevating plant has been put in and has resulted in reducing the cost of handling at this location from 60 cents to 10 cents per cubic yard. A plan view and a section through this plant are shown in accompanying illustrations.

Under the storage bin, a concrete pit and foundation are arranged so that sand is dumped directly from the work cars into a concrete hopper. From here it is raised by a motor-driven elevator to the overhead storage bin. The bottom of the bin is above the track level, and several spouts extend out from opposite sides so as to discharge the dry sand directly into pails used to fill the sand boxes on passenger cars. These spouts are made of cast iron and are arranged with suitable shut-off slides so that the flow of sand can be regulated conveniently by the operator and thus is not discharged on the ground.

Construction of Bin

The bin proper is made of heavy wood construction, with 2-in. x 6-in. studs supported from the outside by 6-in. x 6-in. horizontal stringers and tied across with reinforcing rods. The inside of the bin is lined with 2-in. tongued and grooved plank and the outside is covered with drop siding to give the entire structure a neat appearance. It is so located between two loop tracks at the terminal that cars may be run in adjacent to the bin for loading with sand, as shown in the accompanying plan of the general layout. Plans now in process of formulation contemplate securing wet sand directly from its source along the Kaw Valley Electric Railway and handling this material in Differential Dump trains directly to the sand plant. It is expected that this will make an additional saving in the cost of handling the material.



The 48th Street and Troost Avenue Sand Bin Is Conveniently Located Between Two Loop Tracks at the Terminal

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The Readers' Forum

Park Tax Not in Lieu of Other Taxes in Baltimore

THE UNITED RAILWAYS & ELECTRIC COMPANY
OF BALTIMORE

March 11, 1925.

To the Editor:

Referring to article on page 390, March 7 issue of the JOURNAL, entitled "Park Tax Paid," I wish to call your attention to the last sentence, "It is paid in lieu of all other local taxes." This is incorrect.

In addition to the park tax stated this company pays an easement tax on streets not subject to park tax within the city; also the usual state, city and county taxes on its assessed property, capital stock tax, paving maintenance obligations, car and pole licenses.

Will you kindly make the necessary correction through the JOURNAL?

L. H. PALMER,
Vice-President and General Manager.

A New Name for the American Association Discussed

THE OHIO BRASS COMPANY

MANSFIELD, OHIO, March 9, 1925.

To the Editor:

In last week's issue of the ELECTRIC RAILWAY JOURNAL, L. H. Palmer, vice-president and general manager of the United Railways & Electric Company of Baltimore, commented on the desirability of changing the name of the American Electric Railway Association so that it would be more in keeping with the times. He suggested the name "The American City and Interurban Transportation Association." It is good to see this thought get out into open discussion. It seems so obvious that the name of the association should be modernized in keeping with the general movement throughout the industry that the desirability of such a change can be accepted almost without debate.

The name suggested by Mr. Palmer was probably designed to start discussion and would likely not be his final choice. It seems cumbersome and too hard to use practically. This long name would be further complicated by the necessity to incorporate the names of the affiliated associations, for example, "The American City and Interurban Transportation Engineering Association." To use the initials for a handy reference, we would have the "A. C. & I. T. A." and the "A. C. & I. T. E. A." This would be about as hard to keep straight as that euphonious name "The Amalgamated Association of Street and Electric Railway Employees of America," or whatever it is.

A shorter name, so long as it was distinctive, even though not quite so descriptive, would seem to be better because easier to use. Why not the name "American Transportation Association," as suggested in an editorial in the ELECTRIC RAILWAY JOURNAL for Feb. 2, 1924. This is a broad name which would cover all the activities of the association, would differentiate it from the steam railway association, and would not become greatly complicated by expansion to express the affiliated associations. We would then have the following names: American Transportation Association; American Transportation Engineering Association; American Transportation Accountants' Association; American Transportation Claims Association; American Transportation and Traffic Association.

It would be virtually impossible to select a name that would be truly descriptive of the association work, as this would mean that Mr. Palmer's suggestion would have to be amplified to "The American City and Interurban Electric Railway and Bus Transportation Association." Thus, as long as full description cannot easily be had, why not select the shortest practical name?

HARRY L. BROWN.

Reduced Fares Without Special Tickets

Beaver Valley Traction Company Grants Half Rates for Dollar Day Sales by Carrying Inbound Passengers Free

FOR a number of years past the Beaver Valley Traction Company has co-operated with merchants in its territory, as at Beaver Falls, Pa., to make Dollar Days more successful by means of half-rate fares during shopping hours. The plan has hitherto involved the printing of special tickets at the expense of the Chamber of Commerce. Those passengers who presented the cards printed for the purpose paid the regular fare but retained the ticket after it had been punched by the conductor. On the return trip from Beaver Falls, the passenger who presented this punched card returned free. In this way the passengers received an effective half-rate, off-peak fare. However, the cost to the merchants came to about $175, whereas the number of cards turned in by the operators might not exceed 150, partly because some riders did not bother about the reduction.

It occurred to C. D. Smith, general manager of the Beaver Valley Traction Company, that the process could be simplified by making use of the "honor system" now successfully applied in regular zone-fare operation, which does away with all zone checks. Mr. Smith proposed that the Beaver Falls merchants donate to the railway the $175 subsidy hitherto expended for the cards. The railway in its turn would make it still easier to attend the sales by announcing that passengers bound for Beaver Falls between 8:30 a.m. and 3 p.m. on Dollar Day need pay no fare at all on the inbound journey, needing only to say that they were bound for Beaver Falls. Returning at any time whatever, they would pay the regular fare for whatever ride they took.

The simplified plan was first tried in August, 1924, and repeated on Feb. 19 of this year. Under the old plan, the extra revenue on Dollar Day was something under $100. Under the new plan, the last Dollar Day brought about $250 in excess of the normal weekday revenue. Of this amount $175 came from the merchants in lieu of printing expenses.

The management's investigation shows that although a passenger could ride free to Beaver Falls during the limited period by merely announcing his intention to shop, no large proportion of the riders availed themselves of this privilege. It was, of course, good psychology to put the passenger in the position of deciding whether he would or would not pay for the ride both ways. Undoubtedly the ability to take the ride inbound without spending any money was a stimulus to going to Beaver Falls on Dollar Day.

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Tramways Better for Mass Transportation

WHILE congestion is bound to occur with a large volume of traffic moving in a restricted area, tram cars carry more people than would be possible with motor buses under like conditions. This is the conclusion of the royal commission which is investigating the railways and tramways of Australia in New Zealand, as mentioned in the issue of this paper for Dec. 13, 1924. The commission, which is made up of Sir Sam Fay and Sir Vincent Raven, with Charles Travis, secretary, has now made public the results of its study on the New South Wales system of railways and tramways.

In the portion of its report relating to the Sydney tramways, the commissioners say that they are impressed with the excellent operation of the system, and favorable reference is made to the movement of 1,000 to 1,200 people a minute from the racetrack at Rantwick. Commenting on the subject of street congestion, the report says, in part:

In London, among other cities, congestion is at its worst where trams do not run. So great is their obstruction to movement that omnibuses progress within the city limits at the average rate of from 3 to 4 m.p.h. The fact is that, given enough traffic of any sort in any type of vehicle, converging upon a comparatively small central area, congestion must ensue. Whether vehicles roaming over the streets at will are less liable to cause street obstruction than trams fixed to a line of route and having the same number of passengers is questionable. That the Sydney trams carry more people during the peak hours than would be possible with a similar number of motor buses is certain, and although the former do in certain times constitute what has been called a moving platform, they do no more than is necessary to provide for the traffic offering. . . . The immediate remedy, as in the case of the railways, is the completion of the city railway and the electrification of the suburban lines.

In their conclusions, the commissioners recommend that determination in regard to the finance of the railways be taken out of the control of the treasury officials and be turned over to the railway commissioners and that the railway and tramway systems should be so conducted that their gross receipts should be no more than sufficient to cover working expenses, reserves and interest on capital, including sinking fund. Gains from operation would go toward improving the service and lower fares.

The report, as published by the government printer, occupies 204 pages, of which 120 contain the report itself and the remaining pages the testimony presented by the various witnesses examined.

Association News & Discussions

Oklahoma Association Holds Large Convention

THE seventh annual convention of the Oklahoma Utilities Association, held March 10-12 at Oklahoma City, was the largest in the history of the association. More than 60 persons were on the program. The sessions included general meetings, participated in by all branches of the industry, and special meetings held by the telephone, gas and electrical divisions. The feature of the convention was an address on "Community Transportation" by Frank R. Coates, of H. L. Doherty & Company, New York.

Mr. Coates declared that nothing can take the place of electric railway transportation in cities of America, pointing out that notwithstanding the tremendous increase in the number of automobiles during the last 10 years the number of street car riders had also increased.

The tendency today is to look upon all local public transportation as essentially of a monopolistic character. The electric railway company is in the best position to conduct this business, and it should be charged with the operation of all facilities, regardless of the type of vehicle used. This should include even the taxicab service. A coordinated unified system of transportation under one reliable management will give to the community the maximum service at the minimum cost.

The speaker made a plea to electric railway companies to pay special attention to their public relations questions and also to use merchandising methods in the sale of transportation. One of the surest ways to build up traffic, he said, is to make the service attractive. Properly maintained tracks, rolling stock well maintained and painted and kept clean, service fitted to the public requirements—all of these the community has the right to expect, provided it is willing to pay for them.

Committee on Standard Classification of Accounts

PRESIDENT DAVIS of the American Electric Railway Accountants Association has appointed M. W. Glover chairman of the committee on standard classification of accounts of the association. Mr. Glover, who is general auditor West Penn Railways, with headquarters at Pittsburgh, takes the place on the committee of Mr. Wallis, who died several months ago.

New England Street Railway Club

THE annual meeting of the New England Street Railway Club will be held at the Copley Plaza Hotel, Boston, on Thursday, March 26. The meeting for the election of officers will take place at the hotel at 3 p.m. The feature of the meeting will be the banquet in the evening.

The main speeches in the evening will be two in number; one by John N. Shannahan, president of the American Electric Railway Association, and the other by Lucius S. Storrs, now president of the Connecticut Company, but just elected as managing director of the American Electric Railway Association. There will also be vaudeville. The toastmaster of the evening is Charles E. Peirce.

Proposed Standards for Track Bolts

PRELIMINARY sheets showing proposed standard dimensions for track bolts and nuts are being issued by subcommittee No. 4 of the sectional committee on the standardization of bolt, nut and rivet proportions, organized under the procedure of the American Engineering Standards Committee. These provide for two different types of track bolts, one with oval necks and the other with elliptic necks.

The dimensions of the various bolts have been arrived at through a very exhaustive study of the various bolts now manufactured and in use. Preliminary analysis showed that nearly every railway in the country had its own particular design so that there were almost as many types as there are railways. The adoption of these standards should thus prove to be of great value.

The threads provided for the proposed standards are either American standard or Harvey grip thread and they may be formed by cutting, drawing or rolling. In order to specify tolerances for the threads and still make certain that a tight fit is obtained such as is necessary in railway service, manufacturers have made up a large number of special bolts and nuts for both the maximum or minimum tolerance. These have been tested very carefully to determine the pounds pull

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that is necessary at the ends of various length wrenches in order to start and turn the nuts.

Property Ownership Spreading

Commerce Secretary Hoover Tells Academy of Political Science Diffusion of Ownership Is Force for Social Stability

DIFFUSION through the country of ownership of the kind of property that carries with it a voice in business management was put forward as the greatest contribution to social stability by Herbert Hoover, Secretary of Commerce, in a speech delivered by radio from Washington, D. C., to the annual dinner of the Academy of Political Science, held at the Hotel Astor, New York City, on March 9.

"I am convinced," he said, "that one of the continuous and underlying problems of sustained democracy is the competent and wider diffusion of property ownership. Indeed, I should become apprehensive of the ultimate destruction of democracy as such if I believed that the result of all our inventions, all of our discoveries, all of our increasing economic efficiency, would be toward further and further concentration of property ownership. In the large vision, we have a wider diffusion of ownership today than any other nation in the world."

Mr. Hoover's speech was the principal event in a day devoted to various phases of the subject "Popular Ownership of Property: Its Newer Forms and Social Consequences." Harry L. Stimson, former Secretary of War, presided at the banquet. Other speakers of the evening included Howard T. Sands, vice-president National Electric Light Association; Donald R. Richberg, counsel for the railway unions, and William A. Prendergast, chairman New York State Public Service Commission.

In surveying the tendency toward diffusion of ownership, Mr. Hoover pointed particularly to the need for facts upon which national policies could be based. He continued, in part:

"Since the beginning of the republic there have been periods when tendencies were toward concentration of ownership, and other periods when economic forces and public action made toward greater diffusion. Certainly the courses of diffusion were dominant during the great migration which occupied the West. Again, I believe that one of the by-products of the last war was still another period of increasing diffusion of ownership of property.

"Our high wages during the past three years with the consequent general expansion of savings has, I believe, also marked another period of diffusion.

"For purposes of analysis of the diffusion of ownership we might divide property ownership into two categories: On one hand, the bank deposits, the bonds, the mortgages, the preferred stocks, that is the priority securities; and on the other hand, the common stocks, the land holdings, the stocks of goods, tools, and so on.

"No doubt, saving among the people at large is in the direction of greater safety for their investments. The vast increase in the number of savings, bank deposits, the great growth of industrial and insurance companies, the large expansion of building and loan associations, the unprecedented absorption of all kinds of governmental securities, are all evidences of this.

"But there is another field of property ownership, that of home ownership, that I regret to say we are going backward in. During a period of 10 years we have fallen nearly 10 per cent in the national ratio of owned homes.

"One of the first requisites for adequate economic discussion, and thus the development of any economic or social form, must be the determination of the economic facts.

"I believe your discussions will be a valuable contribution to this subject. Elaboration and development, of course, is the first and fundamental step toward well directed national economic government, and if from your discussions can come the development of the first step, that is, of methods by which we may secure more searching, scientific investigations, more accurate determination of facts, you will have made a great offering."

American Association News

Maintenance Night Held by Metropolitan Section

Papers Describing Maintenance Practices of Rapid Transit Lines and Surface Railways Were Presented and Discussed by Leading Men in the New York Section—Three Hundred Attend

THE regular March meeting of the Metropolitan Section of the American Electric Railway Association, held in the Engineering Societies Building, New York, on March 6, was devoted to a discussion of maintenance problems. About 300 men connected with the electric railways of this section were present, and reports of the officers show that this section now has a membership of 825. This is made up largely of the men who actually do the work of operating and maintaining railway equipment.

Maintenance on High-Speed Electric Lines Discussed

A paper on the inspection and maintenance methods of the New York, Westchester & Boston Railroad was presented by J. T. Hamilton, master mechanic. This road has a trolley potential of 11,000 volts a.c., and the maintenance work on car equipment is divided into inspection, light repairs and general overhauling. At regular inspections, made every 2,600 miles, car body inspectors look after the interior of the car generally and include such equipment as doors, windows, curtains, seats, etc. Truck inspectors look after all truck parts and the adjustment of air-brake equipment. Motor inspectors look after the propulsion and auxiliary motors. Control inspectors give attention to switch groups, reversers, line switches, master controllers, pantograph trolleys, etc.

The shopping for light repairs occurs after operating from 45,000 to 55,000 miles. At this time worn commutators are turned and wheels with sharp flanges are given attention. At the same time, wearing parts are given a close inspection, and replacements are made of the bushings, pins, guides, slides, etc.

General overhauling is carried out on a 200,000-mile basis. At this time, both the interior and exterior of cars are painted, sash, doors, trapdoors, etc., are overhauled, and all car equipment is placed in efficient working condition. The practice on the New York, Westchester & Boston Railway is to overhaul electrical apparatus, such as switch groups, transformers, etc., on every second general overhauling or painting period.

Mr. Hamilton emphasized the value of proper co-operation of the various departments of electric railways, and also of the value that manufacturers' engineers could be to the various operating companies by having their engineers follow up the performance of various parts of the equipment, so as to recommend methods for overcoming troubles and also collecting information which could be used to good advantage in bringing out new designs, which would incorporate valuable improvements.

Maintenance Practices of B.-M. T. Discussed

W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Corporation, spoke briefly of the development of rapid transit lines and the progress made in providing equipment that would stay on the road for longer periods with less frequent inspection. He said that with the first introduction of electric cars it was necessary to adjust the brakes every night and also to oil certain parts. Now, through the introduction of improved methods of lubrication and the use of mechanical devices, such as slack adjusters for brake equipment, the inspection periods for rapid transit cars on the B.-M. T. lines has been increased to 1,500 miles. As these cars average 166 miles per day, cars come in for inspection about every nine days.

The basis for making inspection and overhauling in Brooklyn has changed somewhat since Mr. Gove first took charge about 20 years ago. At first, inspections and overhaulings were made on a time basis. Next, this was changed to a mileage basis and the intervals were varied to accommodate

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different types of equipment. Today a mileage basis is used, supplemented by a time inspection. The time inspection occurs every 120 days, and the average time consumed per car is approximately 20 minutes. Inspectors of the railway also make the repairs. In addition, there are checkers at each shop reporting directly to the head of the inspection forces and who make certain that the work is done properly.

Mr. Gove stressed the value of an efficient organization for carrying out maintenance methods, and also said that the age of the equipment had much to do with the amount of work required. In New York, particular attention is devoted to avoiding all kinds of failures and to keeping ahead of the time when defects might occur by making renewals and replacements at frequent intervals.

Mr. Gove also referred briefly to the keeping of records regarding the performance of equipment. He said that when the system was small with comparatively few cars, this worked out very satisfactorily, but with the large increase of equipment which has occurred through extension of rapid transit operation in New York, such a system became unwieldy and failed in its desired results. He said that the quality of maintenance must depend primarily on the organization's ability to detect and remedy defects, and that the co-operation of sales representatives in the metropolitan district had been of great help. Engineers of the various manufacturers have investigated failures and sought out remedies to problems as they occur and thus helped materially to effect the high grade of maintenance now carried on. In referring to the close co-operation between departments which exists on his system, Mr. Gove said that this had come about principally through necessity, since all departments have come to realize that if they were to carry on transportation economically, there must be close co-ordination between all departments.

Manufacturers' Side of Maintenance Presented

H. H. Wentworth, transportation sales engineer Westinghouse Electric & Manufacturing Company, gave several examples of what the various operating companies in this district have done to improve maintenance. He said that the duties of manufacturers' engineers were first to design equipment that could be easily and efficiently maintained at low cost, and second to help out on the maintenance problems of the operating companies. He called attention to the advisability of specifying limits of wear to determine the life of parts and to make certain that repairs were made in time. If wearing parts are left in service too long, they eventually destroy themselves and so require an entire replacement, while if repairs are made before their period of usefulness is over, the parts can be reconditioned and considerable expense saved. In order to make certain that limits when once established are lived up to, the work of inspection and replacement must be made as easy as possible. Mr. Wentworth expressed the opinion that there were some advantages from having the inspection and repair departments separated.

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, said that the yardstick for measuring maintenance results must be different for different properties. The operating companies, he said, offer to the manufacturers laboratories for development and trial of equipment, and it was to their advantage that these be utilized to the fullest extent. He said that he considered the mechanical and transportation departments the backbone of any railroad system, and that their results could make or break a property. He referred to his early experience in operating high-voltage equipment and said that such lines offered problems not ordinarily encountered in regular 600-volt operation.

Maintenance of Surface Equipment Discussed

A paper on surface car maintenance was presented by D. J. Locke, staff engineer Public Service Railway, Newark, N. J., who gave some statistics as to the size and number of cars maintained by his company, and outlined the various maintenance methods. There are many problems encountered in surface car operation that do not occur with rapid transit lines. A grooved rail must be used, which makes the track inelastic and complicates special work layouts. It is also more difficult to keep track in proper repair and bad joints or excessively worn crossovers result in much jar to the rolling stock, which requires more frequent maintenance.

Drainage problems in connection with surface operation also present some difficulty, and frequently equipment must operate through water and the accumulation of dust and dirt is also more apparent. Traffic congestion is also a factor and operation through congested sections results in frequent damage from collisions and necessitates repairs that would not be encountered in rapid transit service.

About 2 years ago the Public Service Railway began the use of Economy meters for determining inspection periods. These meters register kilowatt-hours of energy consumed, but by knowing the average consumption of the different cars, a car-mile basis is readily established. The meters used have three dials which provide for three inspection periods. The red hand is set to provide for a general inspection period equivalent to every 750 miles. On this inspection bearings are oiled, brakes and brake riggings are adjusted, light repairs are made to the electrical equipment, car bodies, etc. This work is done in the carhouses over pits. General overhauling and painting are done annually. The principal parts that require attention are brake rigging and truck parts. At this time motors are removed and overhauled and car body repairs are made, together with the repainting.

Mr. Locke referred briefly to the revamping of motor equipment which is being carried out on his property and which was described in the ELECTRIC RAILWAY JOURNAL for Dec. 20, 1924. He said that this work had reduced the annual cost of bearings to one-quarter the previous cost and that failures of bearings in service were now almost unknown.

Another part of the equipment which is receiving particular attention by the Public Service Railway is the insulation of field coils and armature coils. A system of insulating these parts has been developed in the shops of the company which while of high first cost is far cheaper in the end since it has resulted in very few failures. Field coils receive seven successive dippings and bakings in as many days before they are installed. Armature coils receive three dippings and bakings after the coils are assembled in the armature slots.

In discussing maintenance practices of the Third Avenue Railway, J. S. McWhirter, superintendent of equipment, said that the men who actually do the work are the important parts of a maintenance organization, and that these of course must be supplemented by men who direct the work. He referred to the effect which operating abuses have on increasing maintenance costs, and the value of co-operation from the operating department in order to reduce these. He said that while it is necessary to keep ahead of failures by making renewals and replacements, the scrapping of parts which still have service is a waste which should not be countenanced by maintenance superintendents. He referred to the increase in time for the inspection periods which had occurred through the use of better and more modern equipment, so that daily inspections no longer were necessary.

The inspectors make repairs on the Third Avenue System and Mr. McWhirter described a type of record card which he had found most satisfactory. This provides a list of the various parts of the car equipment and space for signature opposite each part by the man who makes the inspection. He said that collisions and accidents in service were most frequently laid to bad brakes and he stressed the importance of making certain that handbrake equipment and air brake parts were kept in a high degree of repair, so that there could be no cause for complaint on this score.

L. T. Carter, assistant engineer General Electric Company, spoke of the assistance that manufacturers' engineers could give to solving maintenance problems. He said that the duties of such engineers were first to make sure that the equipment is of proper capacity. If it is too large, excessive power consumption and cost result, and if it is too small, maintenance costs will be high. He spoke of some of the improvements which had been made in modern motor design to decrease maintenance costs, and said that wherever possible old motors should be revamped so as to incorporate modern methods. He spoke briefly of the maintenance requirements that were necessary for gasoline-driven buses, trolley buses and the new types of electric drive for buses as used in Philadelphia. One of the particular advantages of electric drive and also of the use of the trolley bus was from the fact that electric railways could use the same maintenance forces for this equipment.

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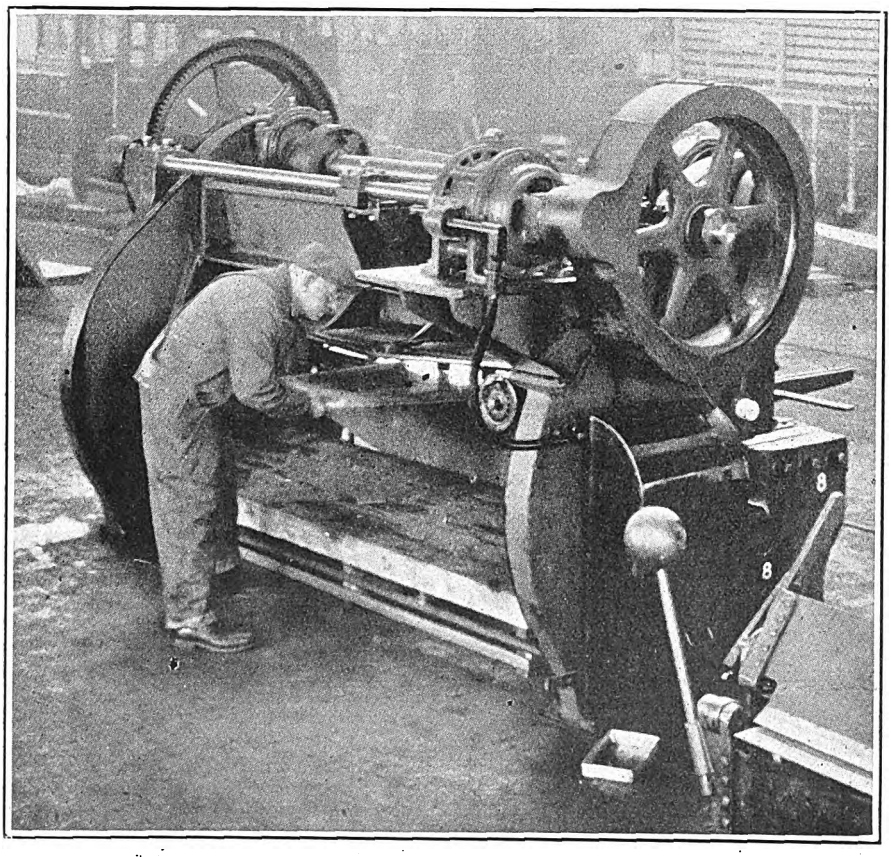
Maintenance of Equipment

Squaring Shears in Constant Use

AMONG the new machine tools installed in the Everett shops, Boston, Mass., is a Niagara power-driven squaring shear. This machine weighs 12,800 lb., is driven by a 7½-hp. General Electric motor and is used to cut up all kinds of sheet metal up to ¼ in. thickness. It is kept in constant use cutting raw sheets to size for metal panels for the sides of cars, dasher signs, ventilators, cams and tank pans and more than 3,000 panels for the sides of cars have been cut with it since it has been installed. Officials state that the saving from the use of this new machine over older types previously used will pay for its cost, which was $2,750, in less than 2 years' time. The economies resulting from its use are more accurate work, greater speed of operation and finer adjustment of the cutting edge.

In operation a sheet of metal is put into the machine and automatically clamped into position. Then a descending knife cuts off a strip of any predetermined width. The width can be varied with extreme accuracy by a fine adjusting gage to give a variation of 1/16 in. The knife cuts a length of 96 in. at one operation, and it is possible, provided the strip to be cut off is not more than 15 in. wide, to cut up a sheet of indefinite length by subsequent cuts. For accommodating this type of work a gap is provided in the frame of the machine which allows the sheet to move along after each cut.



Cutting Sheet Metal with Squaring Shears in New Everett Shops, Boston, Mass.

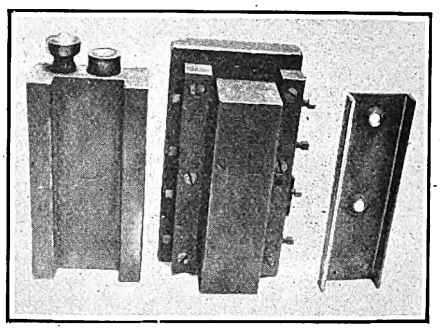
Die-Formed Pedestal Wear Plates

BY T. E. WOOD
Master Mechanic Omaha & Council Bluffs Street Railway, Omaha, Neb.

WEAR plates for truck pedestals on the Omaha & Council Bluffs Street Railway are formed from ¼-in. flat steel stock with the punch and die equipment shown in the accompanying illustration.

After forming to the proper shape, the plates are punched to receive counter-sunk plow bolts, with which they are fastened to the pedestals. The small conical shaped punch and die shown in the illustration are used to punch and countersink these bolt holes in one operation.

It will be noted that the forming punch consists of a base member and



Pedestal Wear Plates Are Formed and Punched in Omaha with This Die Equipment. The Block in the Punch May Be Changed to Handle Different Thicknesses of Material

a removable block held in place by eight set screws. Wear pieces are made from both ¼-in. and 5/16-in. material, to take care of variations in the clearance between journal boxes and pedestals on different trucks. To form these different thicknesses of material, it is only necessary to change the projecting block in the punch.

After the punch and die have been securely clamped in place on the press slight adjustments in the relative position of the parts may be made with the set screws on the punch.

Truck-Squaring Device

BY H. F. FERGUSON
General Foreman Highland Park Shops, Department of Street Railways, Detroit, Mich.

AN ARRANGEMENT which provides a simple and easy method of checking trucks for squareness while they are in normal position over the shop pits is used by the Department of Street Railways, Detroit.

A number of hacksaw marks are made on the base of the rail as shown at *A* in the accompanying illustration. These are spaced 18 in. apart and painted white lines make them readily visible. Duplicates of these

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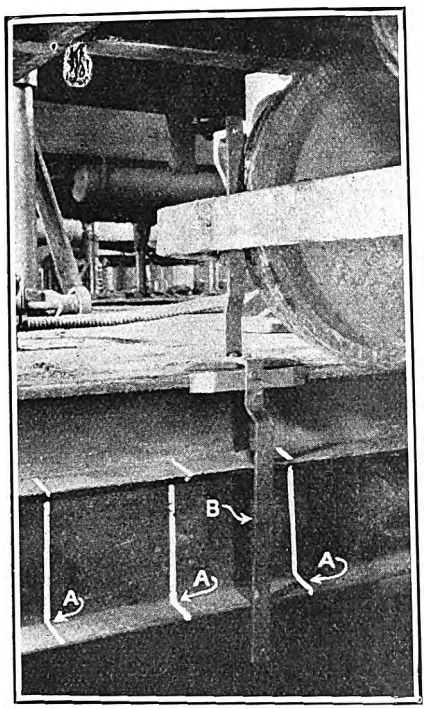


This Simple Arrangement Is Used by the Department of Street Railways, Detroit, for Checking Trucks for Squareness

marks are carefully laid off at right angles on the opposite rail. This allows the use of the scheme with the trucks at any position on the track.

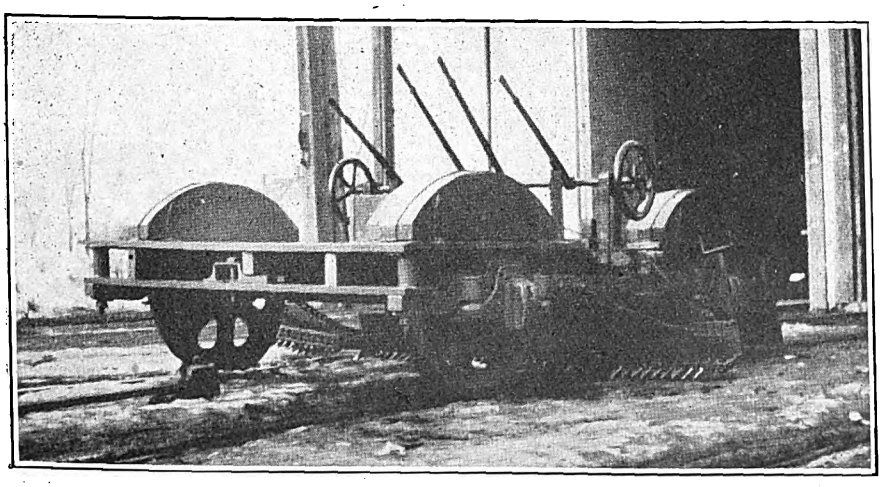
A gaging device of steel, shown at *B*, serves in the nature of a square, reaching from the base of the rail to the center of the wheel tread. With a truck in position the gage is set on the rail as shown in the illustration, with the upper edge of the straight edge against the tread of the wheel. The distance between the lower projection of the gage and the hacksaw mark is measured with a steel rule. The same procedure is repeated on the opposite wheel. After calipering the two wheels, the combined measurements indicate whether or not the truck is square.

On trucks with motors of such size as to make the axles accessible, a similar gage is used, but in this case the upper arm is offset to come inside the wheel. A steel rod held parallel to the rail between the center of axle and the upper arm of the gage allows measurements to be taken as in the previous case, but by this method the diameter of the wheel need not be considered.

Ice Cutting Saves Gear Cases

AN ICE cutter constructed in the shop of the Biddeford & Saco Railroad, Biddeford, Me., by the master mechanic and the regular shop employees has proved very satisfactory. The apparatus consists of an old truck frame, on which there has been built a plank floor. Underneath the truck frame a 6-in. x 6-in. angle iron has been arranged with ice picks attached to it. These are bolted on as shown in an accompanying illustration. The end sections are hinged so that the center can be used alone or with one or both ends, as desired. Sections are raised or lowered by four levers.

This cutter is hauled by a regular motor car and requires a crew of two men on the car and two on the cutter. Behind the cutter a snow plow is operated, requiring two more men, or six in all. With this equipment the railway has been able to cut down the hard ice center between the rails and on both sides to ½ in. above the track level. This was done on a 5-mile stretch of track in exactly 2 hours, without interfering in any way with regular operation of passenger cars. To have done the same work by hand would have required a crew of 50 men and taken several days. It is thought that the saving on gear cases alone has more than paid for the cost of the apparatus.

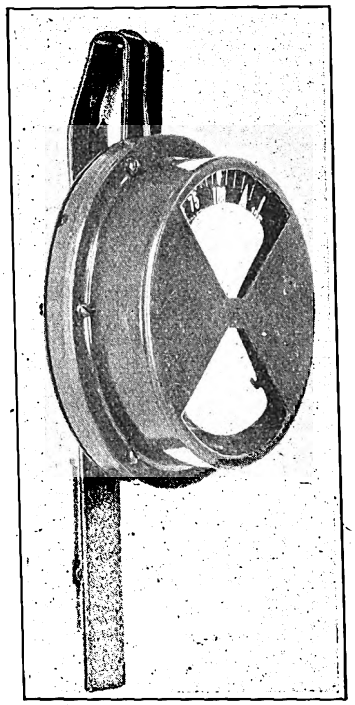


Six Men Using This Ice Cutter on the Biddeford & Saco Railroad Have Cut Down the Hard Center in Less Time than 50 Men Working by Hand Used to Do

New Equipment Available

Load Indicator for Transformers

A LOAD-INDICATING device for distribution transformers which compensates for ambient temperature is a recent development of the General Electric Company, Schenectady, N. Y. It is suitable for transformers of the types used for



This Device Indicates the Average Load that Is Being Carried on a Transformer

miscellaneous purposes on the a.c. circuits of electric railway systems. This instrument consists of two thermometers connected in series. The first thermometer is actuated by the heat of the transformer's top oil; the second, located in the external case, is actuated by the ambient temperature and modifies the reading of the first.

The composite reading given by the hand closely approximates the internal coil or hot spot temperature and, for convenience, is given in terms of "per cent equivalent load." This is the proportion of the safe continuous output of the transformer, represented by the load cycle causing the indication. The dial is calibrated to indicate from 50 to 125 per cent equivalent load. A semaphore is tripped by the mechanism and swings into view

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when the instrument registers more than 100 per cent, equivalent load.

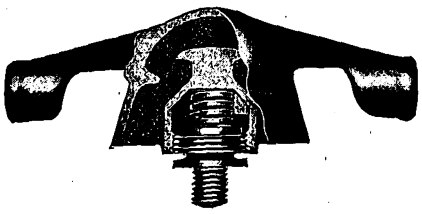
Readings in excess of 100 per cent show that the transformer is too small, since it has carried a continuous load, or a short time overload equivalent to a continuous load sufficient to bring the internal winding temperature to 100 deg. C. or higher.

A resetting lever extends below the external case.

Spring-Lock Hanger

A SPRING - LOCK trolley wire hanger with new principles in design is being marketed by the Ohio Brass Company, Mansfield, Ohio. This is made in two forms, one for cross-span work and the other for bridge, barn and trough suspension. Improved features include a flexible connection between the hanger and ear and provision for aligning the ear with the trolley wire without loosening its hold on the hanger stud.

The cushion feature is provided by a spring which is interposed between the hanger body and the stud. The latter has, on its upper end, a



Hammer Blows from Wheel Passes Are Damped Out with Spring-Lock Hangers of This Type

grooved portion held in position by a bushing which is screwed into the bottom of the hanger. This grooved section is free to rotate in the bushing and is normally held down by the spring. The stud member moves vertically against the spring action when the trolley wheel passes under the ear boss, or with a slight pivoting motion as the wheel approaches or leaves the ear.

The cushion serves to dampen out the shock and reduces wear of the trolley wire and ear at the suspension point. Alignment of the trolley ear is taken care of by a lug cast on the upper part of the stud and a corresponding projection in the upper part of the cavity in which the spring is assembled. These two projections engage each other when the stud is rotated. The ear can be securely fastened on the stud in the usual manner. To align with the trolley wire the ear is turned back and carries the stud with it. The lugs separate without disturbing the union between the stud and the ear.

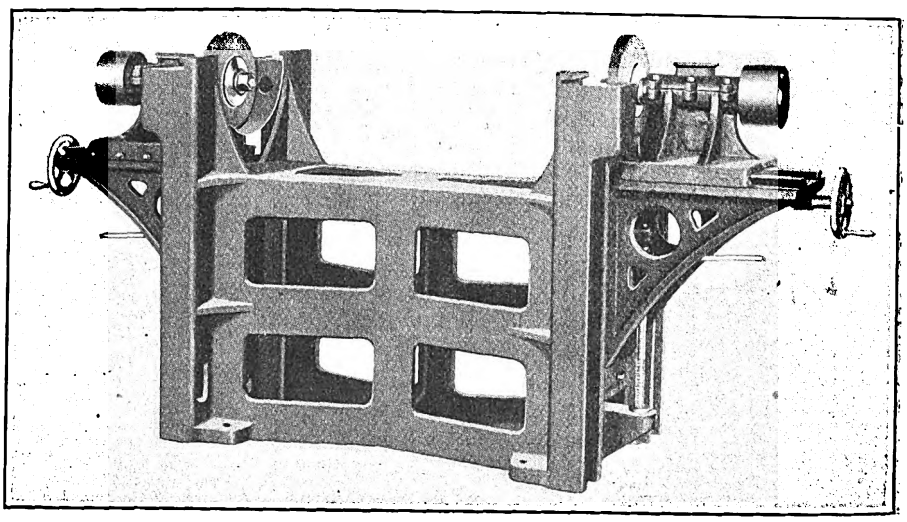
The ear can be removed by unscrewing in the usual manner and the lugs are brought into engagement in the opposite direction to hold the stud against further rotation.

The insulating material of the spring-lock hangers is of standard design. The metal parts are malleable iron, hot-dip galvanized. The spring is tempered steel, electro-galvanized, and as a further protection against corrosion the chamber in which it is mounted is packed with fiber grease.

Car Wheel Grinder

THE Hanna Engineering Works, Chicago, Ill., has recently brought out an improved type of QMS car wheel grinder. The frame of the new machine is in one piece, whereas in previous types it was built of a number of parts. This construction reduces the liability for misalignment of co-ordinating parts and affords a substantial support for the knee and saddle members. The mounting is movable, horizontally and vertically. The two removable sections of the track rails are rigidly supported at four points by the frame. When these rail sections are removed space is provided for the grinding wheels of the machine.

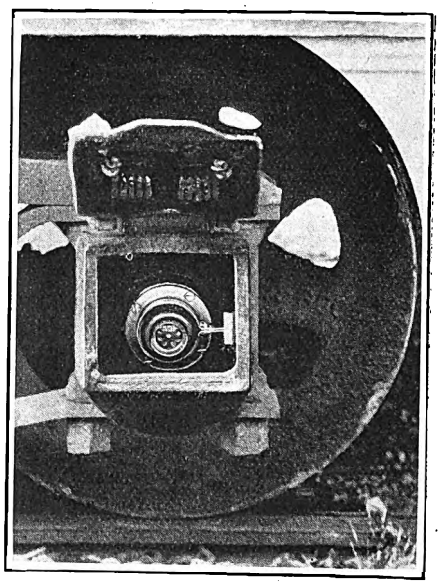
The operation of the grinder is similar to that of previous types. The car is run over the grinder pit and the axle is jacked up. In the grinding operation the axle and wheels are driven by the car motor, with the grinding wheels in contact. The grinding wheels used in the new type grinder are 14 in. in diameter by 2 in. face. They are driven at a peripheral speed of 5,500 ft. per minute.



Car Wheel Grinder with One-Piece Frame Preserves Alignment

Hub Odometer Applied to Cars

THE accompanying illustration shows the device known as the "Hub Odometer" attached to the axle of one of the cars of the Peoples Railway, Dayton, Ohio. This type



A Device for Measuring Mileage Directly Applied to the Journal of an Electric Car

of instrument as developed for recording mileages of trucks and motor buses was described in the ELECTRIC RAILWAY JOURNAL for August 9, 1924, when it was first placed on the market by the Ohmer Fare Register Company, Dayton, Ohio. It records mileage, regardless of the direction of motion of cars. In backing, the mileage is added instead of being subtracted, so that the record of distance covered is the total. The instrument is fastened directly to the axle without flexible shafts or gears, and the figures are always right side up so that they can be read conveniently.

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The News of the Industry

Bold Buffoonery in Buffalo

Officers of International Railway Resent Caustic Comment of Local Papers—Jitney Idea Persists

Mayor Frank X. Schwab of Buffalo, N. Y., has served notice on Herbert G. Tulley, president of the International Railway, that unless there is a substantial improvement in service by April 1, 1925, he will declare a transportation emergency exists in the city. The courts have upheld the contention of the International Railway that the Mayor of the city is without authority to declare a transportation emergency and issue jitney bus permits. The Mayor has been making statements to the public press criticising the management of the company and the service rendered.

In his attacks on the company, Mayor Schwab has had the support of Frank C. Perkins, the Socialist member of the City Council, who is pushing his pet idea of a municipal bus system providing for an expenditure of $1,000,000 for complete motorization of the city under municipal ownership. The application of the International Bus Corporation, a subsidiary of the railway, for a permit to operate a bus line equipped with double-deck vehicles in Richmond Avenue has been sidetracked in the City Council because of the decision of the Public Service Commission in granting a higher fare to the railway.

Because of the violent attacks made by the Buffalo *Evening News* against the railway management and Henry W. Killeen, of counsel for the traction interests, Mr. Killeen has sought to institute John Doe proceedings in the courts to determine whether or not warrants for criminal libel could be obtained against the publisher, the city editor and several members of the editorial staff of the newspaper. The specific editorial aimed at Mr. Killeen was published under the caption, "Thumbing His Nose," in which the counsel for the railway is claimed to have defied the courts and the Public Service Commission in his efforts to get a higher fare for the International.

Contracts at Detroit Still Subject to Council's Approval

The Council of Detroit, Mich., has defeated a proposed amendment to the city Charter intended to remove the Department of Street Railways from the jurisdiction of the Common Council in so far as all deeds, contracts, leases or purchases are concerned. The proposed amendment was sent to the Council for submission to the voters at the election on April 6. It was recommended for approval by the Street Railway Commission and really was the outcome of the commission's refusal to abide by the Council's demand for the purchase of motor coaches not considered best fitted to meet the city's needs.

The Council's action was in accordance with advice from Mayor John W. Smith.

Charles P. O'Neil, Corporation Counsel, quoted Section 13 of the city Charter to mean that the Street Railway Commission had no right to submit a matter to the Council when it was disapproved by the Mayor.

In his letter to the Council Mayor Smith pointed out that the intention of the proposed amendment was to remove from the Council the power granted by the people to approve contracts entered into by the Board of Street Railway Commissioners. He said from the fact that the Charter states that the actions of the board are subject to the approval of the Mayor, the impression might be gained that the proposed amendment bore the approval of the chief executive. On the contrary, he disapproved of it. The present method of acting on the Board of Street Railway contracts is believed by the Mayor to be eminently proper.

"Memorial" Praised and Blamed

Railway in New York Says It Is Not in Politics and that Its Proposed Plan Is the Quickest Way of Obtaining New Subways —Recent Moves Reviewed

THE Interborough "Memorial" that was presented to the Governor and Legislature of the State of New York on March 5, and briefly mentioned in the issue of this paper of last week, has been severely criticised in some of the New York daily newspapers as an unwise political move and an aid to Mayor Hylan. Other representatives of the metropolitan press indorse the policy of the company in making the statement. Spokesmen from the company itself say that it was issued to give the public and the Legislature the facts and that the company is seeking neither to elect nor to defeat Mayor Hylan.

The memorial was mentioned only briefly last week owing to the fact that it was made public the day on which the issue of this paper went to press. It declares that the company is financially unable to defray the expense of lengthening those local platforms which now are suitable for only six-car trains, as recommended in the McAvoy report. It points out that in 1922 a reduction was made in the sinking fund requirements of the company's 5 per cent bonds, the rental on the elevated lines was reduced, the stockholders paid $10,500,000 into the treasury and the employees voluntarily reduced their wages 10 per cent. These voluntary concessions made it possible for the company to avoid a receivership. Only one-half of this reduction in wages has been restored. New rolling stock has been purchased through equipment certificates. No dividend has been earned or paid on the stock of the company since Jan. 1, 1919. The company is willing even now to continue as it has been doing and do the best it can under the circumstances, but it cannot meet the additional requirements of more service or extensive station improvements without additional revenue.

The memorial also pointed out that the city is in like condition as regards credit for the construction of new subways. A constitutional amendment is proposed to give the city more credit, but at best it will take 3 years to pass this and it may take longer. If $275,000,000, the amount proposed to be freed, is added to the present non-self-sustaining investment in subways, the aggregate will be $526,500,000, the interest and sinking fund of which must be carried in the annual tax budget. In addition the city proposes to expend as many millions ($60,000,000 in 1925) as can be allocated to subway purposes each year thereafter. This would mean that in 5 years $826,500,000 could be added as a burden on the taxpayers as long as the 5-cent fare remains the maximum chargeable.

Constructive Plan Suggested

A way to avoid all delay in subway construction is through a statutory increase in the rate of fare sufficient to release immediately the city's frozen credit of $251,500,000 in the present subways. It is with the hope of taking the subject out of politics, the company said, that it made this appeal and that it was willing "and requests that the statute shall provide for impounding the amount of increase in the rate of fare enacted so that it may receive no return greater than what the statute may declare necessary to enable it to render adequate service and make such additions and betterments as may be found necessary or advisable by the public authority having jurisdiction in the matter." No rate of fare was mentioned in the memorial, but it is believed that the directors had in mind a 7-cent fare, as this was the sum mentioned in a brief submitted to Judge McAvoy by James L. Quackenbush, counsel for the Interborough, as an unofficial suggestion during the hearing. Of this amount Mr. Quackenbush

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suggested that 1 cent of the increase go to the city to pay interest on its unproductive subway bonds. This would be adequate to free the city's present subway investment from the debt limit and make $250,000,000 available as a revolving fund for new subways. Mr. Quackenbush further suggested that the rental on the Manhattan Railway be limited by the new arrangement to 5 per cent and Interborough dividend to 4 per cent and that a similar provision for a fixed return could probably be made in the case of the Brooklyn roads.

Memorial Attacked

After its publication, the memorial was attacked by several of the daily papers, by Mayor Hylan, Commissioner McAneny and William J. Schieffelin, chairman of the Citizens' Union. The *Times* declared that if the directors were in a tacit conspiracy with Mayor Hylan to bring about his election and to prevent all subway building, they could have hardly acted in a way better fitted to attain those ends. They must know, it said, that their petition to the legislature will never be granted. The *Evening World* said: "There is not the least possibility of any such authorization being granted. More than that, it should not be granted." The principal newspaper defender of the company was the Brooklyn *Citizen.* An editorial in that paper was concluded as follows:

> The Interborough directors, at least, are not seeking to delude the people. They know that the solution of the question lies in an increase in fare and that there is no other solution, because the transit problem is not a political but a business proposition, and every business proposition is determined by intake and outgo.

The *Wall Street Journal* considers that the plan of the Interborough offers the sole chance of early transit relief. It said it is unfortunate that circumstances require the question of a reasonable fare to be put to the Legislature, but that power, at the request of the Transit Commission, does not lie with it now except in concurrence with the Board of Estimate, so that appeal to the Legislature was necessary.

Another important contribution to the discussion was the report of the committee of the Merchants' Association, abstracted on page 372 of last week's issue. This report condemned the policy of the City Board of Transportation in projecting plans for a completely isolated system. Such a policy, the report points out, involves a needlessly great capital outlay, additional fares for many passengers, reduced earnings and probably the necessity of making up a deficit by taxation. Instead, the committee recommended "a policy of unified operation" with utilization of both old and new facilities. Figures were published to show that the proposed isolated subways would require capital charges per route-mile more than twice those of the present subway. On fares, the committee said that while it was in full accord with the city authorities in wishing to see the 5-cent fare maintained, if possible, the aim should be to have the lowest possible rate of fare consistent with satisfactory service.

The New York Transit Commission, through George McAneny, chairman, declared the commission was "totally out of sympathy" with the request for an increase in fare. Chairman McAneny pointed out that the commission had opposed previous attempts to raise the fare and no member of the commission had changed his mind. If the question of money stringency was the controlling consideration, he was unable to see why the city of New York should not issue its bonds in full, if necessary, to cover needed improvements. It would simply be putting its own money into its own investment, and it could carry that added investment at a lower rate of interest than the company, therefore a larger net return would be earned from operation. The large expense of the item of improvements mentioned in the McAvoy report to be borne by the company was one of the reasons set forth in its memorial for a change in conditions.

Mayor Hylan, who had just returned from Palm Beach before the memorial was presented, indulged in a characteristic statement. "The increased-fare crowd have marched up the hill at Albany with a big fanfare," he said, but "they have been routed in the past and they will be routed again. It has taken the people a little time to get on to their maneuvers, but they are no longer being duped by traction professions of interest in the public, when experience so often proves that it is an interest limited solely to swelling traction pockets."

Another criticism of the move, on the ground that it "would help re-elect Mayor Hylan," was made by William J. Schieffelin, chairman of the Citizens' Union, at a luncheon of that organization on March 7.

The Company's Reply to Criticisms

James L. Quackenbush, general counsel of the Interborough, replied to the comments of Mr. Schieffelin in a letter to him published on March 11. He said in part that the position of the company is not and cannot be influenced one way or the other by political consideration. The memorial described the only method by which new subways could be obtained and existing subways made more efficient. These statements have not been denied, only the charge is being made that the company is helping to re-elect Mayor Hylan. In conclusion Mr. Quackenbush said:

> If we have misstated facts, if we have exhibited merely greed for more income, if we are wrong in thinking that there is no other way quickly to obtain new subways, we shall be very glad to have you put us right. But we cannot believe that it is an answer to a carefully studied plan to assail that plan on the ground that it would be of political advantage or disadvantage. We are not in politics; we are operating a railroad and endeavoring to show the way to get additional service and to supply additional facilities as rapidly as possible.

$6,000,000 Needed for San Francisco Municipal Railway

M. M. O'Shaughnessy, city engineer of San Francisco, Cal., has recommended submission to voters of a new bond issue of $6,000,000 to care for municipal railway development needs. It is estimated that the sum or $635,000 is immediately necessary. It will be obtained by diverting funds intended for other purposes, chiefly depreciation reserve. Needs listed are chiefly railway and bus line extensions, a $1,256,000 tunnel and a $2,045,000 cut for line extension. Four extensions and five new bus lines are listed as necessary.

Railway Meets Emergency with Buses

Bus service is proving popular in Ann Arbor, Mich., a city of 20,000 population. The first day the buses were run there to replace the street cars 2,942 persons were carried. This was on Feb. 1. Sunday, Feb. 22, there were 3,099 passengers and on Feb. 28 there were 6,100. For the fourth week of operation the buses carried 32,942 passengers, an increase of 3,406 over the preceding week. The routes are arranged so that almost all of them touch the center of the city and the University of Michigan Campus. There is a 20-minute service over most of the routes, with one or two operated at intervals of 15 minutes.

For many years six single-truck trolleys traversed a few streets from the university to the depot, and from the non-collegiate section of the city to the manufacturing district. It was too expensive to lay rails to the rapidly growing suburbs. Early in November, 1924, the People's Motor Coach Company, a subsidiary of the Detroit United Railway, suggested the substitution of buses for the cars. The fare structure agreed upon was: 10 cents cash, three tickets for 25 cents, a weekly pass for $1.25, and a 50-ride, non-transferable book at $3, good for 40 days. The fare schedule is based on a formula which will provide the necessary operating and overhead charge, but will, with sufficient traffic, amortize the electric railway investment over a period of years. The present arrangement is a temporary one to run for a year. At the end of that time the granting of a franchise will be taken up.

The new service was ushered in with considerable ostentation. On Friday afternoon, Jan. 30, twelve Yellow coaches lined up behind one of the old street cars. A veteran "dinkey" led the procession. It bore a sign which read: "Good-by, Folks! The scrap heap for mine." On the other side this bad but effective verse was displayed:

> I leave you now without reproach,
> I humbly bow before the coach.

The coaches carried signs which read: "Our up-to-date service for this up-to-date city begins Feb. 1."

Railway Attacks Philadelphia Power Plan

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has aligned itself in opposition to the five applications filed with the Pennsylvania Public Service Commission by the Philadelphia Electric Company and the Susquehanna Power Company asking approval of their development plans for the Conowingo (Md.) hydro-electric project. The Philadelphia Rapid Transit Company bases its action on the assertion that it uses about 20 per cent of the output of the Philadelphia Electric Company in the operation of the street-railway system of the city, two-thirds of the energy

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for this system being purchased from the other utility. It maintains that the present rates of the Philadelphia Electric Company are excessive and discriminatory and asks for their reduction. The rapid transit company says that in 1923 the electric company earned 20 per cent gross income on the estimated original cost of its properties, whereas the Public Service Commission in 1916 approved a stipulation that the power company's earnings should not exceed its bond interest and 7 per cent on its then outstanding capital stock.

The railway company's brief maintains that the electric company is to pay an excessive price for the site, that Drexel & Company, who held the options on the Conowingo site and are the fiscal agents for the undertaking, are to receive excessive promotion commissions, and that Stone & Webster, who, it is understood, are to build the plant, will make excessive profits.

Referendum Proposed in Tacoma

At a recent meeting of the City Council of Tacoma, Wash., a proposal was submitted by the Tacoma Young Men's Business Club for a referendum on the question of a settlement of the car-jitney controversy. The club wants to send out a ballot by mail to secure "yes" or "no" answers to the following questions:

1. Shall the City Council negotiate a settlement of the railway problem?
2. Shall the city make franchise concessions to the railway if a reduction in fares is obtained thereby?
3. Shall jitney buses, now paralleling railway lines, be discontinued and buses allowed to operate only in territory not served by the railway if a reduction in street car fare can be obtained thereby?

The club plans, if it can secure the approval of the Council, to bind the Tacoma Railway & Power Company to abide by a settlement based on the desires of the people. The matter was referred to a committee of the whole Council for review at a meeting to be held in the near future.

More Study and Greater Discussion Needed at Toledo

The transportation system of Toledo, Ohio, has become the subject of political discussion again through various proposals lodged in the City Council in the last few weeks. At a meeting on March 6 attended by councilmen, the street railway commissioner, officials of the Community Traction Company and administration officials, including the Mayor, no decision was reached, but it appears that the city will ask a modification of some of the terms of the Milner service-at-cost plan.

Prior to the meeting Councilman Grant F. Northrup suggested before the Council that existing schedules and service in effect at the time of the adoption of the Milner ordinance be restored. Since that time many rerouting changes have been made and some lines abandoned. In an open letter to Mr. Northrup, Judge John M. Killits of the federal court blamed the high fares and difficulties in obtaining improvements on the fact that nontaxpaying competitive bus lines had been fostered and that the Council had failed to take advantage of the clause in the Milner ordinance forcing the Doherty interests to invest an additional $1,000,000 capital in extensions and a crosstown line.

To make matters still worse the *News-Bee*, a Scripps-Howard newspaper, which fought the service-at-cost plan originally and favored municipal ownership, has returned to the attack with renewed energy. It now insists that the car lines shall be junked and bus service substituted.

Other matters aggravate the situation. The home-rule bus bill will bring several new proposals for complete city-wide bus systems. The Toledo People's Motor Bus Company already has an application before the state body for permission to duplicate the service now rendered by the Community Traction Company, and it is known that an Eastern group has been making a survey of the city with the idea of offering to install a complete bus system to operate on a sliding fare scale with 10 cents as the maximum.

Further agitation is aroused by the appearance of Joseph J. Beierla, head of the Toledo Motor Bus Company, with an offer to operate buses to all parts of the city at a 6-cent fare with universal transfer if granted a 15-year franchise. Mr. Beierla's present 5-cent line competes with the Dorr Street line of the Community Traction Company.

It is expected that the major problems will be taken up at a series of conferences between the city and company representatives following a further study of the problem by them.

Franchise Ready in Kansas City

For several months conferences have been held at Kansas City, Mo., at which the Council committee and the general manager and the receivers for the Kansas City Railways have considered conditions under which the railway should operate buses in auxiliary service. On March 9 the draft of the franchise was practically finished, with all major points considered more or less satisfactory. The ordinance will now go before the Council.

Service-at-Cost and Purchase Contract

Milwaukee Stockholders Recommended to Accept New Grant to Be Submitted to Voters on April 7—Provisions of New Operating Arrangement Reviewed

STOCKHOLDERS of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., have been called for a special meeting on March 23 to vote on the proposal that the company accept the new "service-at-cost and municipal acquisition" contract with the city of Milwaukee. The directors recommend that the ordinance be accepted. While one result of operation under the contract will be definitely to limit the earning power of the company in the principal district which it serves, the directors are said to feel that the advantages to be anticipated on the other side, which include stability in earnings, improvement of relations with the community and protection to the company's actual investment in the event that the city desires to purchase, will compensate for the loss thus involved.

Acceptance of the contract ordinance by the company involves among other things the giving of an option to the city of Milwaukee to purchase the properties owned by the company within the contract area and an undertaking on the part of the company to place an additional mortgage upon its properties within the contract area for the security of such bonds as the city may in the future elect to purchase from the company.

The contract applies to approximately 80 per cent of the business and property of the company, being the property in Milwaukee and the adjacent suburban communities. The ordinance proposes that the contract go into effect July 1, 1925, and that it shall be subject to termination at the end of any 10-year period thereafter upon two years notice from the city to the company.

The contract has a threefold scope:

1. To assure to the community utility service at cost (including therein a stipulated return on the company's investment) and to enable the company to earn the cost of the service rendered and so defined.
2. To vest the utility regulatory function in the city rather than in the state administrative authorities.
3. To give the city an option to purchase the properties at a price to be determined by application of an agreed formula and meanwhile to participate in the financing of the properties.

The fixed properties comprised within the rate base and those subject to purchase by the city are to be identical. The agreed value of the investment in these properties as of July 1, 1925, the effective date of the proposed contracts, is tentatively fixed at $56,456,506, subject to adjustment upon the completion of the joint audit now being conducted by representatives of the city and the company. In case of inability of the parties to agree upon this adjustment the matter will be determined by arbitration. Sixteen per cent of the value of the investment of the company in these fixed properties has been allowed as reserve for depreciation accrued to the effective date of the contract.

Cost of service is defined as all operating expenses including taxes and rentals, reasonable allowances for depreciation and operating reserves and a stipulated return upon the company's investment. For the first year the return is to be at the rate of 7.7 per cent. This is the return to which the company is now entitled under state regulation. Thereafter the rate of return will be increased or diminished by one-half of the amount by which the rate of cost of the company's borrowed money exceeds or is less than 5.7 per cent. In the contingency of certain investments by the city in the company's funded debt, the contract provides that the company shall receive a somewhat lower return upon that portion of its capital which is borrowed from the city. Service rates are to be raised or lowered from time to time with a view

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to enabling the company to earn the full amount of the cost of the service rendered but no more than that amount.

Under the proposed contract the corporate autonomy of the company is to be respected and the physical custody and operation of the properties are at all times to remain in the hands of the company. However, the city, acting through its own commissioner, will be vested, in lieu of the state administrative authorities, with the power to specify and control the quantity and the quality of the service to be rendered and the additions, extensions and permanent improvements to be made to the property within the contract area, subject to the condition that such regulation shall not jeopardize the prospect of earning the full cost of the service rendered. In the event of disagreement between the parties to the contract the matter may be submitted to arbitration.

In lieu of the present right of the city to acquire the properties by condemnation proceedings, the contract gives the city an option to purchase the properties within the contract area as an entirety, upon 6 months' notice, at a price equal to the agreed value of the investment in the properties with certain adjustments for reserves, etc. The city is also given an option to invest from time to time in the funded debt of the company (but only when the company is requiring and seeking new capital) either by purchase of mortgage bonds or by making long term unsecured loans bearing interest at the average preferred stock dividend rate. For the purpose of providing a vehicle for this investment by the city, the contract provides that the company shall execute a new mortgage upon its properties within the contract area for the security of those bonds which the city may elect to purchase. The contract also provides that any balances in the reserves built up by charges to the cost of the service under the contract which are in excess of reasonable requirements may be transferred to the credit of the city's investment account.

The proposal that now goes before the stockholders of the company is the result of deliberations that have been in progress since February, 1919. The ordinance was passed by the Common Council on March 2, 1925, and was approved by the Mayor on March 3, 1925. The contract ordinance provides that it shall not become effective until it shall have been accepted by the company and approved by the Railroad Commission and further approved by a majority vote of the qualified electors at a special election to be held on April 7.

Conviction of Dynamiters Upheld.—The United States Circuit Court of Appeals has upheld the convictions of four men who were found guilty in the United States District Court at Buffalo of conspiracy in connection with the dynamiting of the Buffalo-Niagara Falls high-speed line of the International Railway at Elwood Station during the strike of July, 1922. The prisoners will begin to serve their sentences at once. They are Francis Reilly, Healy Breeze, William L. Van Dell and William H. Smith. Each was sentenced to a year in Atlanta Federal prison and to pay a fine of $2,000.

Chicago Campaign Started

Speakers' Bureau, Press Bureau and Advertising Department Pushing New Franchise Ordinance

An expensive campaign financed by unknown sources was formally launched on March 9 to put across the Chicago traction ordinance at the April referendum. A suite of offices has been opened with a speakers' bureau, press bureau and advertising department and the politicians and leading organizers have been recalled from winter resorts. The most intensive drive for a civic proposition ever undertaken in Chicago appears to be ahead.

Forty Aldermen who voted for the ordinance in Council, all heads of city departments, party counsellors, civic students, public ownership proponents and technical men are listed as speakers.

The public attitude is paradoxical. Four separate branches of thought may be given as an example:

A party favoring the ordinance because it is municipal ownership.

A party opposing the ordinance because it is municipal ownership.

A party opposing the ordinance because it is not municipal ownership.

A party favoring the ordinance because it is not municipal ownership. This support comes from those won by the consolidation arrangement.

All are given hearings by civic bodies and by "town meetings," which a corporation has been formed to foster.

Mayor Dever has taken an important step regarding extensions and new building which he hopes to finance partly by assessment on benefited property to avert a repetition of the familiar shower of gold into the pockets of real estate developers at the expense of the utilities financing the extensions.

Part of the Massachusetts assessment law has been written into an amendment for the Illinois law and will be voted on by the Legislature. This will permit, primarily, the immediate digging of the downtown subway arteries by assessment and the apportionment of the assessments after the work is done. On a $45,000,000 subway under the loop district the property owners would have to pay about $18,000,000, based on precedents recently made by the courts. The proportion for the remainder of the rapid transit lines, about $380,000,000, will have to be worked out without precedent. Subway building experience in Boston, New York and Philadelphia was studied but appeared to be of little value.

New York State Railways Expands Bus Business

Entrance of the New York State Railways into the interurban bus field on an extensive scale is presaged by the company's purchase of the Rochester Interurban Bus Company, operating eight buses on routes from Rochester to Livonia, Hornell and Le Roy. The company will be continued under the same name, with James F. Hamilton, president of the railways, as president of the bus company.

This initial step is expected to be followed by absorption of other interurban lines in Rochester, Syracuse, Schenectady and Utica, all served by the New York State Railways. The purchase of the interurban line puts the New York State Railways among the most active bus operators in railway circles. It operates the East Avenue and Browncroft lines in the city of Rochester, the Dewey Avenue feeder line and a crosstown trackless trolley line, as well as routes in Syracuse and Utica. The railway has a permit pending for a line over the Ridge Road in the suburban town of Greece and plans for a network of bus lines along the lake shore to serve Ontario summer colonists and adjacent towns.

The company's new acquisition is a corporation with a capital stock of $50,000. L. M. Caves was president. The company acquired the Hornell line last fall from C. G. Abernathy. Hornell is about 70 miles from Rochester, Le Roy about 20 miles and Livonia 15 miles. The three routes serve a rich farming community, connecting, in the cases of Le Roy and Hornell, two prosperous trade centers with Rochester.

The eight buses acquired in the purchase will be used for the time being, but later will be replaced by larger and more luxurious buses. An additional line to Perry, a mill and farm center 35 miles from Rochester, is planned. Improved highways furnish the route for all these lines.

Besides Mr. Hamilton, officers of the reorganized Rochester Interurban Bus Company, are: Vice-president, Daniel M. Beach; treasurer, J. C. Collins, and secretary, Howard Reichert.

Big Developments Reported Ahead for Insull Properties

Persons at Fort Wayne, Ind., in touch with the activities of the Insull interests see ahead, in the passing of control of the properties of the Indiana Service Corporation to the Insull interests, the proposed amalgamation of these newly acquired properties in a supermodern electric transportation system which will link Chicago, Fort Wayne, Toledo and many other important cities in Illinois, Indiana, Ohio and Michigan. The recent changes are also construed to be the forerunner of a plan to cover the entire district with a series of power connections, bringing power directly from southern Indiana mines to supply this entire section of Indiana. As another step in the plans, the Insull interests announced on March 5 the purchase of the properties of the Indiana Utilities Company of Angola, an organization which dominates the electrical power and like fields in that city and twenty other communities, and the acquisition of the Goshen and Warsaw utilities.

Certainly there is a great deal that is still nebulous about the plans for tying the properties together, but credence is lent to some of the recent reports because of the rapidity with which other properties are being bought so soon after the acquisition of the Indiana Service properties, which control light and power concessions in a large area of northeastern Indiana as well as three interurban traction and three city traction systems.

On March 12 a $1,300,000 program of improvements was announced.

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Corrective Legislation Introduced

Legislation has been introduced into Congress which is intended to correct the situation created by the recent decision of the United States Supreme Court regarding buses run in interstate service, which apparently makes such buses subject neither to state nor national authority except in so far as purely local police and tax regulations go. The new measure would authorize the Interstate Commerce Commission to make all necessary rules regarding motor transportation companies and for other purposes. The text of the measure follows:

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled,

That the following words and phrases used in this title shall be construed as follows:

(a) The term "commission" shall mean the Interstate Commerce Commission and the term "commissioner" one of the members of such commission.

(b) The term "transportation" shall mean the carrying of passengers or property from one state or territory of the United States or the District of Columbia to any other state or territory of the United States or the District of Columbia.

(c) The term "motor transportation company" shall mean every corporation or person, their lessees, trustees, or receivers, owning, controlling, operating, or managing any motor-propelled vehicle not usually operated on or over rails, used in the business of transportation of persons or property, or both, as a common carrier for compensation over any public highway.

(d) The term "public highways" when used in this act shall mean any public street, road or highway extending from one state or territory of the United States or the District of Columbia.

Sec. 2. No such motor transportation company shall begin to operate any motor-propelled vehicle for the transportation of persons or property, or both, for compensation between fixed termini or over a regular or irregular route extending from one state or territory of the United States or the District of Columbia to any other state or territory of the United States or the District of Columbia, without first obtaining from the Interstate Commerce Commission a certificate declaring that the public convenience and necessity requires such operation.

The Interstate Commerce Commission is hereby authorized to make all necessary rules and regulations with reference thereto and the operation of said motor transportation companies applicable to interstate business over public highways.

News Notes

Two Arbiters Chosen.—Trainmen of the Capital Traction Company, Washington, D. C., have selected James A. Gallivan, Representative of Massachusetts, to act on the board of arbitration which is to determine what change, if any, should be made in their wages at this time. As already announced in the ELECTRIC RAILWAY JOURNAL, the company named Stanton C. Peelle, an attorney, as its arbiter. Both these arbiters will select a third member to complete the board.

Franchise Revoked.—The City Council recently revoked the franchise of the Titusville Traction Company, Titusville, Pa., and has served notice on S. W. Platt & Company of Pittsburgh, which firm purchased the plant with the intention of scrapping it, to vacate the occupied streets within 60 days. The Public Service Commission has granted a temporary certificate of convenience to the Citizens' Traction Company of Oil City by which buses are run every two hours between Pleasantville and Hydestown through Titusville. The certificate also provides permission to run buses over the new McKinney road from Titusville to Oil City.

One-Man Car Operators Seek More Pay.—An 8-hour working day and an increase in wages of 13 cents an hour were included in recent demands of the railway union employees of the Manchester Traction Light & Power Company, Manchester, N. H. At the present time the operators of one-man cars receive 67½ cents an hour for a ten-hour day.

Extended Bus Service Planned.—The North Carolina Public Service Company through its subsidiary, the Greensboro Bus Company, Greensboro, N. C., plans to extend a bus line to serve west of the North Carolina College, out Spring Garden Street as far as Pomona, and a second line through Glenwood and Piedmont Heights. At present the company operates two bus lines from Jefferson Square to the county home through Westerwood and West Market terrace. The new line will parallel the present car line for practically the entire distance. The fare on the buses, it was stated, will be 10 cents.

Reduces Fare Voluntarily.—The International Railway, Buffalo, N. Y., has voluntarily reduced the fare on the Buffalo-Kenmore-Tonawanda interurban line from 17 cents to 10 cents. It is the aim of the company to divert travel from Tonawanda to Buffalo over this route so that the old Buffalo-Niagara Falls line via the Military road can be abandoned. The old Buffalo-Niagara Falls line now runs as far as Gratwick via Tonawanda. A 25-cent fare is charged from Tonawanda to Buffalo via this line as compared with 10 cents to the Buffalo city line and an 8-cent city fare on the Kenmore-Tonawanda route. The International plans to substitute buses for its interurban cars on the Buffalo-Kenmore-Tonawanda division. The consent of bondholders to the abandonment of tracks in Delaware Avenue on this line is being sought by the International Railway.

Wants Fare Reduced.—The Missouri Public Service Commission has notified the United Railways, St. Louis, that it must reduce the fare between Clayton, Mo., and St. Louis over the Log Cabin or Clayton line from 14 cents to 7 cents, the fare now charged for the same trip via the Kirkwood-Ferguson and Olive Street lines. Rolla Wells, receiver, has presented data to the commission showing that the company was losing money on the Clayton line even at the 14-cent fare. The deficit in 1924 was $9,593. The reduction does not apply to the stretch beyond the Clayton Court House.

Bill Would Mean Loss to Cities.—A fight has been started in New Jersey to prevent the passage of Assembly Bill No. 24, under which loss of revenue would result to the communities in which the trolleys and buses operate. The bill sets forth that where a state tax is levied a local tax cannot be imposed. The new measure was introduced by Assemblyman William H. Iszard, Camden. It has been referred to the committee on municipal corporation. It is declared that if the bill is enacted it will mean a loss of about $150,000 annually to Newark alone.

Refuses to Extend Fare Zone.—On the ground that it would discriminate in favor of one class of passengers as against other classes, the Board of Public Utility Commissioners of New Jersey has refused a request of the town of Harrison to extend one of the fare zones on the Jersey City line of the Public Service Railway between Newark and Harrison, N. J. The zone extension was asked for the convenience of employees of a factory at Kearny, N. J.

Transfer Trial Period Extended.—Announcement was made recently by W. H. Boyce, commercial manager of the Pittsburgh Railways, Pittsburgh, Pa., that in response to many requests, permission had been given for an extension of the trial period of the 10-cent transfer to March 31. Under the plan, a passenger boarding a car and depositing a cash fare of 10 cents is entitled to a transfer to any point in the first fare zone, or to any point which can be reached by a one-token ride from the downtown district.

Trip Tickets Reduces Fare.—The sale of trip tickets, which in effect is a reduction of fare, has been started by the Worcester Consolidated Street Railway on the run from Worcester and Wheeler's stop in North Grafton, Mass., and the administration building of the Grafton state hospital. The regular fare from Worcester to these two stops is 24 cents, but the tickets are sold in strips of five and save the purchaser 4 cents a trip. Passengers who use the tickets are entitled to a transfer in Worcester.

Petitions to Operate Buses. — Receivers of the York Utilities Company, Biddeford, Me., have petitioned the Public Utilities Commission for permission to operate buses from Sanford to Biddeford via Alfred. Electric railway lines are still in operation from Sanford and Springvale to Kennebunk, Kennebunkport, and Biddeford. The trolley line branches from Kennebunk, Kennebunkport, and Cape Porpoise will be discontinued and bus service substituted on the Kennebunkport branch. On the Cape Porpoise branch it is proposed to junk the rails this spring. Buses have been running between Sanford and Springvale. Two new buses have been ordered.

London Railway Outlook Uncertain.—The Canadian *Financial Post* says Sir Adam Beck has the city of London, Ont., in a quandary over its railway. The city has held off making its application to the Legislature for permission to raise funds to purchase the railway. Permission for the company to operate at the present 5-cent fare expires March 8 and as a result the city will face an embarrassing position if the company refuses to carry on at the old fare schedule, at which rate the company says it will be losing heavily. Sir Adam has been dickering to purchase the railway. In the meantime, since he got back in his seat in the Legislature, he got a measure put through the House which canceled the permission which the company had received from the previous house to charge a 5-cent instead of a 7-cent fare with nine tickets for 25 cents.

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Financial and Corporate

New Interests Elected to Fort Wayne Board

Samuel Insull and associates on March 10 joined the management of the Indiana Service Corporation, Fort Wayne. Election of a new board of directors at the annual meeting of stockholders marked the passing of control of the company from Eastern men to public utility operators in the Middle West, chiefly residents of Indiana.

The new members of the board are Mr. Insull, Charles W. Chase, president of the Gary Street Railways, and Samuel Insull, Jr. They take the places of Henry Sanderson, New York, who was chairman of the board; Frank M. Tait, New York, and Percy M. Chandler, Philadelphia. Directors who were re-elected are Robert M. Feustel, James M. Barrett, Henry C. Paul and Harry E. Vordermark, all of Fort Wayne.

Mr. Insull becomes chairman of the company and Mr. Feustel was re-elected president, in active charge of the management of the company. Mr. Vordermark was re-elected vice-president and treasurer and Fred M. Schmidt continues as secretary of the company. No changes in the personnel of the company or its plans of operation are contemplated.

Electric railway lines owned and operated by the company total about 200 miles, of which 56 are city lines and the balance interurban.

Scranton and Altoona Railways Pass to Fitkin Interests

The so-called Fitkin interests of New York have contracted to purchase the Scranton Railway, Scranton, Pa.; Altoona & Logan Valley Electric Railway Altoona, Pa.; the Scranton Bus Company, Logan Valley Bus Company, and several gas and lighting properties, all located in Pennsylvania, and the Florida Power Company, a hydro-electric company which will be connected by high-tension transmission lines with the Pinellas County Power Company, a subsidiary of the Tide Water Power Company, now owned by the Jersey Central Power & Light Company.

It is more than likely that all of these properties will come under the direction of the General Engineering & Management Corporation, New York, of which A. E. Fitkin is vice-president. In fact, the Fitkin interests plan the National Public Service Corporation to be the holding company for their utilities in eight states and a successor to the present Jersey Central Power & Light Company.

In furtherance of this plan stockholders of the Jersey Central Power & Light Company are called to meet at Richmond, Va., March 17 to approve the formation of the National Public Service Corporation. It is proposed to sell $11,500,000 principal amount of first mortgage and refunding 20-year 5½ per cent gold bonds and $4,000,000 par amount of 7 per cent preferred stock, the proceeds of which will retire existing indebtedness. The latter includes more than $6,000,000 in short-term notes which mature within 2 years. A part of the proceeds will furnish funds for the purchase of the new properties.

In addition it is proposed to sell $6,000,000 principal amount of 30-year 6½ per cent sinking fund collateral trust gold bonds for funds to complete the purchase of other companies. Stockholders will vote on the proposal to authorize an issue of collateral trust bonds limited in an aggregate amount of "not more than $500,000,000 at any time outstanding."

The number of shares of common stock without par value will be increased from 220,000 to 1,000,000. The common is to be divided into 500,000 shares of class A and an equal amount of class B stock, and one-half share of class A is to be offered in exchange for each Jersey Central common share now or later outstanding.

The Scranton Railway and the Altoona & Logan Valley Railway were at one time included in the holdings of the American Railways, which was succeeded by the American Electric Power Company, which in turn has passed to Electric Bond & Share interests, which have disposed of the railways included in the group as not essential to their plans for the development of the properties sponsored by them.

Passenger Revenue in Philadelphia Up $753,340

Net Income of $1,810,364 Sufficient to Pay 6 per Cent Dividend and Provide for Co-operative Wage Participation by Men—Reasons Given for Recent Dividend Increase

NET INCOME of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for the year ended Dec. 31, 1924, increased $10,364 over the previous year. Railway operating revenue for the year increased $724,526. The details of the earnings of the company are all contained in the accompanying statement of the income account for the year taken from the recently issued pamphlet report. The company says that the passenger revenue increase of $753,340 was due to the 7½-cent token-8-cent cash fare which became effective Sept. 25, 1924. Net income of $1,810,364 was earned during 1924, thus providing for the P. R. T. 6 per cent dividend, and in addition thereto the amount required to pay the co-operative wage participation to the men.

Seven-Cent Fare Forced Upon Management

In discussing the matter of fares President Dunbar says in part:

P. R. T. was reluctant to lose the short riding built up around the 5-cent fare through long years of painstaking management and employee salesmanship. T. E. Mitten publicly declared that the 5-cent fare was "almost a religion" of his. Mounting costs forced P. R. T. in 1920 to seek a means of increasing its revenue. Mitten Management recommended a straight 5-cent fare, with the elimination of all free transfers and 3-cent exchanges. P. R. T. bankers urged an increase to 7 cents, fearing the effect upon their interests elsewhere if P. R. T. proved continuingly successful under a 5-cent fare.

Mitten Management fought the 7-cent fare throughout the summer of 1920. In July 476,000 car riders signed petitions favoring the straight 5-cent fare. P. R. T. employees passed up a wage increase to which they were entitled, and went so far as to offer their savings without interest to aid in the fight Mitten Management was waging. In October our patrons showed their approval and support by voluntarily paying more that 2,000,000 additional 5-cent fares instead of using the free transfers or 3-cent exchanges to which entitled.

The 7-cent fare, in spite of our efforts, was forced upon this management in November, 1920. In 1921 P. R. T. carried 75,000,000 fewer riders than in the previous year—$3,750,000 worth of nickel fares. P. R. T. has never since reached the record riding of the 5-cent fare days. The 7-cent fare results proved the engineers' estimate to have been wrong, while that which Mitten Management prophesied actually came true.

Considering the normal increase which we would have had with the 5-cent fare, the actual loss because of the 7-cent fare was upward of 100,000,000 passengers—or more than 10 per cent of P. R. T. 1920 patronage. If the straight 5-cent fare had been granted in 1920, P. R. T. would each year have earned so much more than it did under the 7-cent fare that not only would the increase to 8-cent cash-2 tokens for 15-cent fare have been unnecessary, but the straight 5-cent fare still would be sufficient for our needs. The folly of overriding the opinion of a successful operating management, as was done in this case, should have been apparent before the colossal mistake of the 7-cent fare was made.

Elsewhere the company says that the Public Service Commission duly approved its application for authority to

PHILADELPHIA RAPID TRANSIT COMPANY
INCOME ACCOUNT FOR THE YEARS ENDING DEC. 31

	1924	1923
Gross passenger earnings	$45,002,700	$44,249,360
Other operating revenue	652,317	681,130
Railway operating revenue	$45,655,017	$44,930,491
Way and structures, equipment and power—Maintenance, renewals and depreciation	$8,560,400	$8,560,400
Power operation	3,772,643	4,416,306
Conducting transportation	14,31>,232	14,003,087
General	4,593,019	4,060,159
Taxes, including paving tax	2,760,903	2,695,708
	$34,000,199	$33,735,661
Operating income	$11,654,817	$11,194,829
Non-operating income	560,470	621,539
	$12,215,288	$11,816,369
Interest	$1,371,252	$1,161,637
Rentals	8,541,591	8,518,692
Frankford Elevated rental	312,079	156,039
Sinking fund—City contract	180,000	180,000
	$10,404,924	$10,016,369
Net income	$1,810,364	$1,800,000

Note.—Net income exactly $1,80J,000 in 1923, due to wage participation of men being short earned, after first setting aside $1,800,000 for P. R. T. dividend. This shortage has been made up by extraordinary economies during the current year as promised, and the whole of the 1924 wage participation has been fully earned.

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FOURTEEN-YEAR REVIEW OF MITTEN MANAGEMENT RESULTS IN PHILADELPHIA

	To Public				To Employees			To Owners
Calendar Year	Total Revenue and Transfer Passengers	Average Fare per Passenger, Cents	Rides per Capita	Modern Cars in Service	Maximum Hourly Wage, Cents	Insurance, Pensions, Etc.*	Co-operative Wage Participation	Dividend on P. R. T. Stock
1910	443,204,502	4.15	288	100	23	$20,830	.....	.....
1911	517,697,478	4.09	329	215	23½	45,823	.....	.....
1912	549,674,683	4.06	343	1 015	25	55,853	.....	.....
1913	580 011,057	4.03	357	1 715	30	67,028	.....	.....
1914	581 297,949	3.97	352	1 715	30	55,791	.....	.....
1915	594,220,409	3.94	354	1,715	30	63,877	.....	.....
1916	669,008,258	3.93	392	1,715	32	63,336	.....	$1,348,656—4½%
1917	726,936,340	3.94	419	1,715	35	74,795	.....	1,499,277—5%
1918	763,008,395	4.01	432	1,833	48	72,050	.....	1,499,290—5%
1919	866,944,336	4.00	483	1,980	58	207,398	.....	1,499,290—5%
1920	908,482,135	4.18	501	1,980	72½	229,766	.....	.....
1921	836,547,351	4.95	451	1,990	65	234,201	.....	.....
1922	848,883,512	4.91	450	2,095	62½	260,939	$1,650,000	1,799,148—6%
1923	917,787,235	4.81	479	2,615	64	291,725	1,850,000	1,799,148—6%
1924	909,303,945	4.95	467	2,615	65	298,500	1,873,000	1,799,575—6%

* Provided for in the Co-operative Welfare Association, in which P. R. T. pays dollar for dollar with the men.

increase the rates in the city of Philadelphia from 6¼-cent ticket-7-cent cash fare to 7½-cent token 8-cent cash fare, eliminating the 3-cent exchange ticket outside the delivery district and establishing 5 cents as the rate for zones on suburban lines.

In the rate case proceedings before the Public Service Commission the company submitted estimates of the financial results under the higher fare, conforming to the operating budget formula approved by the commission in the valuation proceedings and showing an estimated return of less than $12,000,000, as against the authorized annual return of $14,000,000, representing 7 per cent on the minimum rate base of $200,000,000. The order of the Public Service Commission to charge the higher fare has been upheld by the Superior Court.

It is explained that the company did not contest the "upward of $200,000,000 valuation" handed down by the Public Service Commission, for the reason that, with the 7 per cent allowed by the commission thereon, the net income of $14,000,000 per annum then permitted was sufficient to cover all that the company could be expected now to earn over and above the amount required to carry out its program of improved service.

With respect to the Broad Street subway the company has stated that it will offer a fixed rental when this subway nears completion, and that if its offer be unacceptable P. R. T. will stand ready to operate this city-built line for the city's account in order that the actual results may be made available to determine the amount of rental to be paid thereafter.

The company says that upon the opening of the Broad Street subway a 5-cent fare thereover and a 5-cent fare upon the Market-Frankford elevated will be necessary in order that these main trunk lines be most effectively used in carrying the maximum number of passengers. Five-cent zones for surface cars will then also be necessary to insure a maximum fare of not more than 10 cents between the central delivery district and the farthest city limits, otherwise the combined use of surface cars and subways will so increase the proportion of unprofitable long distance riding as to overwhelm the combined system with increasing costs.

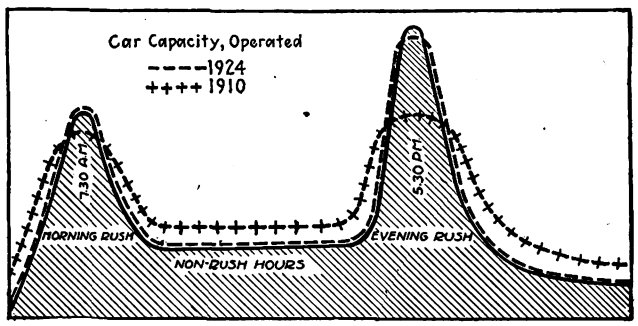
Reason for the Recent Dividend Increase

With regard to the existing agreement between the city and the company the report says:

Under the 1907 city-company agreement sinking fund payments are provided which may, and no doubt will, be used to pay off P. R. T. $30,000,000 of capital stock, at par, in 1957. P. R. T. stockholders paid in their $30,000,000 under the city-company agreement that they should receive 6 per cent per annum cumulative.

P. R. T. stockholders are now about $20,000,000 short of having received their 6 per cent cumulative dividend. This deficit should be made up before the end of the city-company agreement in 1957, by an added annual dividend payment of 2 per cent. With this in mind $1 per share will be paid for the quarter commencing Jan. 1, 1925.

P. R. T. property values make $14,000,000 per annum the minimum payable to owners, $12,000,000 covers all fixed charges and dividends. The use of the entire $2,000,000 remaining to pay back dividends is not advised, as this would interfere with P. R. T. plans.



Shaded Area Shows Passengers Carried on Typical Day from 4:30 A.M. to 11:30 P.M. in Philadelphia

In discussing the matter of employee relations the company says:

No one is more entitled to share in P. R. T. prosperity than the employees who made P. R. T. prosperity possible. This management has, therefore, encouraged the trustees of the employees' co-operative wage participation fund to purchase P. R. T. capital stock in the open market. They are now the pround possessors of more than 150,000 shares, which is in excess of one-fourth of the common stock outstanding.

Motor bus operation as an auxiliary to the railway shows a constantly increasing loss, but it is explained that while increased bus operation is planned, no profit is expected therefrom. As the company sees it "since it must supply even non-paying service where there is any real need therefor, motor buses will cost less than would the extension of our street car tracks to meet this need."

Mitten Management Compensation

In 1911 Mitten Management fee was fixed at $158,000 a year—$50,000 for supervising construction, 3 per cent of the estimated expenditures; $108,000 for supervising operation, one-half of 1 per cent of the estimated gross earnings. This arrangement continued during 14 years past at the lump sum

STREET CAR AND SUBWAY-ELEVATED PASSENGER STATISTICS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

	Passengers Carried		Average Rate per Passenger, Cents		Passenger Revenue	
	1924	1923	1924	1923	1924	1923
January.....	78,297,258	74,857,899	4.79	4.84	$3,748,595.68	$3,625,767.94
February.....	73,247,920	68,570,408	4.78	4.82	3,501,989.71	3,305,182.54
March.....	79,591,970	79,422,257	4.78	4.82	3,802,197.01	3,827,671.64
April.....	78,235,652	76,730,494	4.78	4.81	3,743,361.49	3,694,068.56
May.....	81,288,979	82,591,742	4.77	4.81	3,880,553.43	3,973,888.38
June.....	75,366,347	77,264,587	4.77	4.82	3,591,596.89	3,723,608.11
July.....	71,989,422	72,719,051	4.77	4.80	3,430,594.88	3,493,820.93
August.....	68,650,403	71,609,710	4.76	4.80	3,266,126.70	3,435,641.53
September....	71,260,433	73,237,080	4.90	4.80	3,490,695.31	3,515,750.30
October.....	77,796,303	81,258,998	5.40	4.80	4,203,772.70	3,898,959.12
November....	74,087,646	78,555,394	5.41	4.80	4,010,418.26	3,771,562.44
December....	79,491,612	80,969,615	5.42	4.81	4,332,798.20	3,983,439.27
Total.....	909,303,945	917,787,235	4.95	4.81	$45,002,700.26	$44,249,360.76

MOTORBUS OPERATION OF THE PHILADELPHIA RAPID TRANSIT COMPANY

	Passengers Carried		Passenger Earnings		Deficit	
	1924	1923	1924	1923	1924	1923
January.....	179,606	.....	$16,760	.....	$9,388	.....
February.....	174,230	.....	16,160	.....	6,482	.....
March.....	217,924	.....	20,467	.....	5,951	.....
April.....	222,246	.....	20,904	.....	3,519	.....
May.....	241,807	.....	22,836	.....	3,846	.....
June.....	257,619	.....	24,338	.....	256	.....
July.....	234,948	.....	22,177	.....	2,926	.....
August.....	222,133	.....	20,924	.....	5,621	.....
September*...	200,791	62,436	18,742	$6,244	4,357	$1,687
October.....	223,865	190,926	20,981	18,763	4,482	4,821
November....	194,678	179,495	18,136	17,314	1,772	3,759
December....	210,094	193,257	19,526	18,398	5,040	1,254
Total.....	2,579,941	626,114	$241,951	$60,719	$53,640	$8,147

* Service started Sept. 23, 1923.

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COMPARATIVE INCOME ACCOUNTS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Year	Gross Earnings	Maintenance and Renewals	Power-Opr. Cond. Transp. and General	Taxes	Fixed Charges	Net Income
1911	$22,147,974	3,661,198	8,627,973	1,591,523	8,827,988	560,708
1912	23,282,408	3,492,361	9,097,061	1,659,518	8,961,126	72,342
1913	24,240,592	3,636,088	9,081,213	1,660,236	9,324,559	538,496
1914	23,961,398	3,594,209	8,825,665	1,808,951	9,531,232	201,341
1915	24,315,455	3,647,318	8,677,465	1,783,540	9,622,631	584,501
1916	27,279,517	4,091,928	9,382,587	1,812,541	9,614,908	2,377,553
1917	29,726,927	4,459,039	10,723,912	2,106,769	9,573,522	2,863,685
1918	31,704,427	4,755,664	13,355,575	2,428,819	9,629,353	1,534,816
1919	36,039,520	4,95[illegible],124	17,287,117	2,345,750	9,735,652	1,715,877
1920	39,400,341	5,965,409	20,628,504	2,601,253	9,823,110	382,065
1921	42,911,040	8,560,400	19,874,369	2,798,821	9,870,158	1,807,292
1922	43,23[illegible],972	8,560,400	20,407,117	2,586,001	9,853,177	1,829,277
1923	45,552,031	8,560,400	22,479,553	2,695,708	10,016,370	1,800,000
1924	46,215,488	8,560,400	22,678,896	2,760,903	10,404,924	1,810,365

of $158,000 "despite the fact that the construction expenditures and gross earnings have been so greatly increased." On this matter the report says:

Mitten Management expenses have greatly exceeded the fees paid by P. R. T. for its services. This management will, with your assent, from Jan. 1, 1925, forward, credit itself with 3 per cent of the actual expenditures for supervising construction and with one-half of 1 per cent of the actual gross earnings as its fee for supervising operation.

With respect to the results to the company under the present management the report says:

During the 14 years 1911-1924 under Mitten Management, P. R. T. earned a surplus of $16,896,967. Of this $11,244,385 has been paid in P. R. T. dividends and $5,652,582 put back into the property.

Twin City Valuation $42,949,191

Commission's Findings May Require Fare in Excess of 7 Cents Cash for 7½ per Cent Return—1912-1921 Average Unit Prices for Physical Property

THE Minnesota Railroad and Warehouse Commission has fixed the valuation of the Minneapolis Street Railway at $25,346,080 as of Jan. 1, 1922, and of the St. Paul City Railway at $15,998,849 as of Jan. 1, 1924. This is the first step toward fixing fares in the two cities that will result in an adequate return to the companies. In each instance the fare is now 6 cents flat, with universal transfers.

The commission in its report fixes the fair value of the properties on Jan. 1, 1925, as follows:

St. Paul City Railway:	
Physical property depreciated as of Jan. 1, 1924	$14,998,921
Going concern value	999,928
Total fair value as of Jan. 1, 1924	15,998,849
Net additions for 1924	162,650
Total value Jan. 1, 1925	$16,161,499
Minneapolis Street Railway:	
Physical property depreciated as of Jan. 1, 1924	$23,494,863
Fort Snelling and Como Terminal property	153,284
Value of water power leases	113,803
Going concern value	1,584,130
Total fair value as of Jan. 1, 1922	$25,336,080
Net additions for 1922, 1923 and 1924	1,441,612
Total value as of Jan. 1, 1925	$26,787,692
Combined value as of Jan. 1, 1925	$42,949,191

The decision of the commission was rendered on March 6. The body did not set a date for hearing on the question of fares, but contented itself with giving out at 10 a.m. the result of its investigation as to the valuations of the properties. Experts hold that the figures justify a continuation of a fare of 6 cents in Minneapolis and a fare of 6½ or 7 cents in St. Paul. In the Duluth case, recently decided, the commission fixed the rate of return at 7½ per cent. In either instance it is expected there will be an appeal to the district courts—in Minneapolis, if the fare is more than 6 cents, an appeal by the city, if not more than 6 cents by the company; in St. Paul the city already has filed notice of appeal from the valuation announced on March 6.

In Minneapolis the fixed valuation is $14,346,080 more than the city's request of "fair value" for rate-making purposes. The company had set out five general valuations of its property of various dates, starting with estimated original cost at $27,553,509 and running to $49,465,864 as of July 1, 1921, at current prices.

In St. Paul the $15,998,849 valuation of the commission compares with the company's figure of $34,249,374 and the city's figure of $12,051,744.

It was found that in the Minneapolis case the company's figure for going concern value was reduced from $6,000,000 to $1,584,129, and the working capital claimed from $480,315 to $150,000, while the claim of $1,032,123 for water power assets was eliminated.

Operating income of the Minneapolis company for 1923 was $1,902,863 and for 1924 $1,761,930. On a valuation of $25,346,080 at 7½ per cent the company must earn $1,900,956, or $1,906 less than the 1923 income and $130,025 more than the 1924 operating return. With the 1924 figure as a standard the required increase in gross revenue from operation would be 1.8 per cent.

In St. Paul the operating income would be $1,199,913, or $460,381 more than the reported income for 1923 and $571,058 more than the 1924 figure, or an increase of 9½ per cent in the case of 1923 and 12½ for 1924.

Since the date of the appraisal the company has added about $600,000 annual capital improvements.

The commission denied the contention of the city of St. Paul that the company's paving between tracks before April 1, 1921, should not be included as property. It was determined the fair value of paving as of Jan. 1, 1920, was $1,549,061, "before structural and general overhead are added." The commission denied the company claim of $782,229 for water power leases and reduced the going concern claim from $4,000,000 to $999,928.

In the case of the Minneapolis Street Railway the company valuation figure as of September, 1923, undepreciated was $53,248,423, the city valuation undepreciated as of April, cost base was $26,929,828, but for rate-making purposes the city contended $11,000,000 was a "fair value."

Going Concern Value Discussed

The commission approved the company's plan of car allocation on the principle of apportioning cars among the three operating systems on a demand basis. The company was allowed $150,000 on two power plant generators. The commission found a per cent condition of 87 as proper to apply to the cost-new figures utilized to find the fair value, as compared with the A. L. Drum estimate of 87.9 and the D. F. Wilcox expert figure of 56.7 per cent.

In discussion of the going concern value the commission said:

The injunction of the Supreme Court is that "this element of value is a property right upon which the owner has a right to make a fair return when the same is privately owned, although dedicated to public use." Therefore, we find the going value of the Minneapolis Street Railway to be $1,583,283, which we include as a part of the rate base.

A table of 1923 and 1924 revenues of the two companies involved as presented at the hearings by Engineer H. E. McWethy of the commission is as follows:

	1923	1924
ST. PAUL CITY RAILWAY		
Total railway operating revenue	$4,851,243	$4,589,120
Total railway operating expense	3,596,904	3,491,263
Net operating revenue	$1,254,339	$1,097,856
Taxes	514,807	469,001
Operating income	$739,532	$628,854
MINNEAPOLIS STREET RAILWAY		
Total railway operating revenue	$8,054,924	$7,669,002
Total railway operating expense	5,346,277	5,161,470
Net operating revenue	$2,708,647	$2,507,531
Taxes	805,784	745,601
Operating income	$1,902,863	$1,761,930

Among several moot questions were the track extensions outside the Minneapolis limits, including the Fort Snelling and Columbia Heights lines. The Columbia Heights line is in the next county and the Fort Snelling line is in Hennepin County. The city's contention was observed in the rejection of the Heights line, but in the case of the Fort Snelling extension, which is operated as part of an interurban line to St. Paul, the extension was held property of the Minneapolis Street Railway as an operating system and a depreciated value of $140,579 was allowed for the extension. The private right-of-way of the Lake Harriet line was excluded from the valuation. The commission did not accept the company's cost of

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financing of 5 per cent of the various valuations.

The Twin City railway cases started four years ago. On June 23, 1921, both companies asked the commission to determine a fair value of the properties and "fix and establish" rates of fare. These petitions followed passage by the Legislature of the law putting the rate-making power in the hands of the commission.

Both cities appealed to the courts from an order of an emergency rate of 7 cents and four fares for 25 cents granted Aug. 24, 1921, in the case of Minneapolis and Aug. 29, 1921, for St. Paul. The Hennepin County Court set aside the Minneapolis order on Sept. 6, 1921, and the Ramsey County Court the order in the St. Paul City Railway case Dec. 28, 1921.

Hearings took place in the valuation proceedings from time to time upon the clauses affecting the values and rate fixing in the two petitions. Arguments began Dec. 8, 1924, and were concluded Dec. 13, 1924.

The city of St. Paul seeks an injunction to prevent the Minnesota Railroad and Warehouse Commission from fixing a fare rate in that city based on the trolley property valuation handed down on March 6. Judge R. D. O'Brien of the Ramsey District Court directed the commission to appear on March 9 to show why it should not be required to make a return of its finding to the court, so the city can proceed through Corporation Counsel C. F. McNally to apply for an order restraining the commission. In his petition for an order to show cause the Corporation Counsel said the findings of the commission were "excessive, wholly unwarranted and unjustified by the evidence."

The accompanying table shows the figures which have been set up as the valuations of the Minneapolis and St. Paul railways over a period of many years.

Horace Lowry, president of the railway, refused to comment on the valuation and rate matters until the court has spoken. He said:

> On Friday morning we appeared at the duly appointed hour to hear the report of the commission. We were instructed by the commission to study the figures and to consult with the cities as to their application. In our judgment this meant that all parties would carefully analyze the reports and meet to discuss them. Many things are involved, the most important of which are the rate of fare necessary to produce a fair return on the value and the standard of service to be maintained, as well as the capital expenditure which would be expected of us.
>
> Our plan was to follow the instructions of the commission and see if it would be possible to agree on the matter in question, but within an hour of leaving the room the City Attorney of St. Paul started proceedings in the Ramsey County District Court to enjoin the commission from entering an order to fix the rate of fare necessary to maintain the properties as efficient operating units. In view of this premature court action we cannot comment on or discuss the matter until the court has spoken.

Eugene Lund, Minneapolis street railway inspector, has made a table to show what the result will be if the bill becomes a law that is intended to have the commission consider the Twin Cities as a metropolitan district. His computation is based on the 1924 reports of the two companies:

	Minneapolis	St. Paul
Population	409,125	241,891
Cash passengers	126,492,460	75,627,955
Total car-miles	16,689,755	10,855,837
Car-miles per capita	40.77	44.87
Miles of single track	224. 2	158.60
Population per mile of track	1,819	1,525
Operating expenses per car-mile, cents	30.94	32.16
Passenger revenue per car-mile, cents	45.51	41.80
Gross income	$1,816,102	$631,993
Deductions	1,006,875	631,392
Net income	$809,227	$701

Receivers for Detroit United

Constructive Move Intended to Expedite Reorganization of 600-Mile Interurban

Upon petition of the Yellow Coach Manufacturing Company, Chicago, Ill., one of many creditors, the Detroit United Railway was placed in receivership late on March 10. The defendants consented to the action.

The petition came before Judge Charles C. Simons in the United States district court, who appointed as receivers the Security Trust Company, Detroit, and Joseph W. Simard, vice-president of the Municipal Debenture Corporation of Montreal, Canada.

An ever-decreasing volume of business, with bus and general automobile competition daily becoming keener, and the mounting cost of operation are among the factors said to have contributed to a crisis in D. U. R. financial affairs. Assurance was given that the court proceedings would not interfere with the company's normal service.

The petition conceded that assets of the railway are "of a value approximately 50 per cent in excess of all indebtedness and liabilities." On the other hand, it was set forth that "the defendant has no means at hand with which presently to meet its immediate pressing needs."

Further apprehension was expressed because "some of the creditors are threatening to, and will, bring suits in respect of their claims and will levy attachments and executions on the lines of the railway owned by the defendant," thus hampering operation and creating a danger that one or many of the lines now operated as united might be cut off from central control and operation.

As a result "it was contended that it is essential to the interest of the defendant and of the public and of your orator (the Yellow Coach Manufacturing Company) that the property of the defendant should not be sacrificed or broken up, but that it should continue to be operated as an entire system."

Simultaneous with the announcement of the receivership came a statement from A. E. Peters, secretary of the Detroit United Railway, to stockholders of the company. This follows in part:

No Default in Interest or Sinking Fund Payments

The depression in business in the territory served by your lines still continues. Indeed the situation as affecting your company has grown worse, and in consequence its revenue, particularly from passenger traffic, has been and is much less than was anticipated.

While some important economies in the operating expenses have already been effected, they do not yet offset the decrease in revenue and the net results are far from expectations.

In consequence of this and of other circumstances, it has been found impossible to effect certain temporary financing which it was hoped could have been arranged, pending further financing of a more permanent character, and your directors have decided that it was in the best interests of the shareholders to let the court take custody of the property, assets and business for the preservation thereof and protection of the interests of the shareholders, creditors and all concerned until it was possible to submit to the shareholders a plan under which the necessary funds might be obtained to place the company in such a financial position that complete control of their property can be resumed by them.

Your directors have under consideration a plan having this object in view and they will submit it for the consideration of the shareholders as soon as possible.

It may be added that it is not to be inferred that the placing of the property in the custody of the court indicates or contemplates any default in the regular payment of interest on any bonds or of sinking fund under any mortgage and the receivers have been directed by the court to make all such payments.

INCOME ACCOUNT OF THE DETROIT UNITED RAILWAY

	1924	1923
Gross earnings	$8,360,035	$8,863,598
Operating expenses	7,275,797	7,243,270
Net earnings	$1,084,238	$1,620,328
Other income	692,924	873,582
Total income	$1,777,162	$2,493,910
Interest and taxes	1,625,779	1,630,264
Depreciation	.....	533,826
Balance	$151,383	$329,820
Discount on securities	150,789	78,784
Net income	$302,172	$408,604
Dividends	460,750	921,355
Deficit	$158,578	$512,751

MINNEAPOLIS

Comparison of Various Valuation Figures

F. W. Cappelen, city engineer, for City Council, 1916	$25,914,309
Charles L. Pillsbury, for City Council, 1917	24,346,113
Central Franchise Committee, majority report, 1917	22,156,951
Central Franchise Committee, minority report, 1917	15,470,360
Company valuation, 1917	30,712,101
Company valuation, 1923, original cost	33,130,280
Company valuation, 1923, 1911-1915 cost base	34,675,497
Company valuation, 1923, 1912-1921 cost base	44,327,979
Company valuation, 1923, 1921 cost base	54,690,704
Company valuation, 1923, 1922 cost base	50,634,418
Company valuation, 1923, 1923 cost base	53,248,423
City valuation, 1923, original cost base, D. F. Wilcox	15,921,324
City valuation, 1923, normal reproduction cost, D. F. Wilcox	26,929,826
Railroad and Warehouse Commission	25,346,080

ST. PAUL

Company valuation, 1923, original cost	$21,329,657
Company valuation, 1923, 1911-1915 cost base	22,791,471
Company valuation, 1923, 1912-1921 cost base	28,609,690
Company valuation, 1923, 1921 cost base	34,911,529
Company valuation, 1923, 1922 cost base	32,510,566
Company valuation, 1923, 1923 cost base	34,259,374
City valuation, 1923, original cost base, E. W. Bemis	12,106,010
City valuation, 1923, 1911-1915 cost base	14,323,915
City valuation, 1923, 1922 cost base	22,258,912
Railroad and Warehouse Commission	15,998,849

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Deficit Lower in Buffalo

Operations of the International Railway, Buffalo, N. Y., for the years 1924 and 1923 are compared in the accompanying statement:

INTERNATIONAL RAILWAY—
INCOME ACCOUNT

Year	1924	1923
Operating revenue	$10,276,330	$9,795,185
Operation and taxes	9,509,345	9,293,905
Operating income	$766,984	$501,280
Non-operating income	46,225	44,721
Gross income	$813,210	$546,001
Income deductions	1,479,723*	1,573,239
Net income	*$666,513*	*$1,027,238*

*$87,106 credited to fixed charges, being the amount contributed by I. R. C. stockholders through return of interest on underlying bonds held by voting trustees.

Will Not Abandon City Service.—Charles Folwell, an official of the Monongahela-West Penn Public Service Corporation, Fairmont, W. Va., recently stated that his company did not contemplate abandonment of its city service in Marietta, Ohio, but rather realizes that the system must be built up. He said it was true that neither the bus service nor the railway was a profitable venture just now and that it was true that most of the bus service would likely be discontinued after the year's trial. He said the company would continue to serve the outlying sections when business justified it.

P. R. T. to Sell Bonds.—The plan of the Philadelphia Rapid Transit Company, Philadelphia, Pa., to sell $10,000,000 of a bond issue of 1912 in the open market and increase the rate from 5 to 6 per cent was approved on Feb. 18 in a stockholders' meeting of the Union Traction Company, the principal underlying corporation of the Philadelphia Rapid Transit. The Council a few weeks ago approved the sale and the increase of the interest rate.

Will Abandon One Line.—The Springfield Street Railway plans to substitute bus service for one of its non-paying lines in Westfield, Mass. It also expects to establish a new loop line in the city by coupling up two existing lines. As a first step in this plan, the railway has petitioned the Westfield Board of Aldermen for permission to establish bus service to that city.

Surplus in January.—The Youngstown Municipal Railway, Youngstown, Ohio., in reporting a surplus of $2,337, during the month of January, makes the first substantial payment toward the alleged $1,000,000 deficit. This is the deficit that the Chamber of Commerce committee held was not a legal debt. Traction Commissioner Engle made the report for January at a recent meeting of the Council. It was the second month in succession that the railway showed a surplus after meeting all operating and maintenance costs and paying interest. January also brought a new high figure of $188,788 in gross revenue, and a new high mark in the number of passengers carried of 3,900,708 as against 2,900,000 carried in December, the next highest month. January's profit was well above that of the other paying month, December in which a surplus of $18,767 was shown. Actual cost of operation was $186,453. Total mileage from both cars and buses was 480,295. The total deficit in the stabilizing fund now is $1,234,297, the report showed.

Branch Line to Be Abandoned.—The petition of J. H. McClure, receiver of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, to abandon the Union City to Dayton branch of the line, has been granted by the State Utilities Commission. The branch, 55 miles long, may be permanently abandoned after 60 days' notice to the public. Mr. McClure says the line is a losing proposition. It was stated at the time the application was made that the company proposed to use buses to take care of the transportation needs of the residents affected by the abandonment.

Line to Be Wrecked.—Frank Davies of Nevada City has been awarded a contract by M. Davison, Stockton, to dismantle the line of the Nevada Traction Company, Nevada City, which ceased to operate in December, 1923. Mr. Davison purchased the property at a commissioner's sale under foreclosure proceedings. The carhouse and other buildings at Glenbrook will also be dismantled. The portion to be dismantled extends from the Plaza in Nevada City to the city limits of Grass Valley. The rails within the city limits of Grass Valley were torn up some time ago. The rails within the business portion of the Nevada City will not be taken up until after a meeting by a board of city trustees to determine what action, if any, the city will take in that regard.

$17,000 Placed in Stabilizing Fund.—January revenue figures of the Des Moines City Railway, Des Moines, Iowa, do not indicate that a fare increase will be sought. The company placed $17,721 in its stabilizing fund after payment of all charges. There were 2,633,785 revenue passengers in the month and revenue was $220,749, with additional income of $8,257. Operating expenses and taxes were $173,128, including $14,000 set aside for taxes. These fixed charges were indicated: Bond interest, $20,087; note interest, $7,075; other interest, $9,851; miscellaneous, $1,142.

Abandonment of 17 Miles Allowed.—The Sharon & New Castle Street Railway has been authorized by the Ohio Public Utilities Commission to abandon service on its line from Hubbard, Ohio, to New Castle, Pa., a distance of 17 miles subject to issuance of similar authority by the Pennsylvania Public Service Commission. The Pennsylvania & Ohio Coach Line Company, controlled by the same interests that own the Sharon & New Castle Street Railway, has filed with the Ohio Public Utilities Commission an application for a certificate to operate buses from the public square in Youngstown to Sharon, Pa. The Sharon & New Castle property is controlled by the Pennsylvania-Ohio Power & Light Company.

Book Reviews

Subway Nickels, New York City's Transit Problem

By Harry A. Gordon, Special Corporation Counsel. Published by the direction of the Board of Estimate, New York City. 305 pp., with index.

This book is a special survey of the rapid transit situation in New York by the city's special counsel, retained during the recent hearing before Judge McAvoy to present the charges of the city for the removal of the transit commissioners. To make the survey more accessible, it has been put in book form and presents what might be called the side of the Mayor in the current transportation situation. The history of rapid transit development in the city, also contained in the book, is from that standpoint.

Connecting and Testing Direct-Current Machines

By F. A. Annett, Assistant Editor *Power*, and A. C. Roe, Industrial and Insulation Engineer Westinghouse Electric & Manufacturing Company. First edition, 231 pages, illustrated. McGraw-Hill Book Company, Inc., New York. $2.50.

Two distinct sections make up this book, which is written specifically for the shop man and armature winder. The first section, on reconnecting direct-current machinery, gives rules and principles that govern the changes made in the windings to meet new conditions of service, and shows how these principles may be applied to actual problems of reconnection, so that the man who does the work will have a guide when attempting to apply them to his own problems. The second section, on locating faults in direct-current machines, is presented from the practical side so as to show how such tests are made and gives the reasons for the tests and states why certain results may be expected. Diagrams of windings and test connections make it easy to follow the instructions in the text.

Overhead Line Construction (Fahrleitungsanlagen für Electrische Bahnen)

By F. W. Jacobs. Published by R. Oldenbourg, Munich, Germany. 290 pages and 400 illustrations.

A book devoted entirely to overhead line construction for electric railways is unusual. Nevertheless, Mr. Jacobs has found material on this subject sufficient to fill 290 pages, and his book should be of interest to every one interested in overhead line work who can read German. The first 80 pages are devoted to the mathematics of calculating the sizes of working conductors and feeders for outgoing and return circuits for various kinds of layouts. There is also extended mathematical treatment of permissible spans with different variations in temperatures. Other subjects considered are: Shapes of working conductors, types of collectors, curve construction, overhead appliances, different methods of trolley wire suspension, high-tension lines and insulators, wind pressures, steel and concrete poles, line and pole erection, bracket construction.

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Personal Items

Connecticut Officials Advanced

Messrs. Punderford, Flickinger and Bennett Will Have Increased Responsibility on Retirement of Mr. Storrs to Take Up His New Association Duties

PROMOTIONS all along the line are announced by the Connecticut Company, New Haven, Conn., effective April 1, on which date L. S. Storrs, president, will retire from the company in order actively to assume the duties of his new office as managing director of the American Electric Railway Association. John K. Punderford, long vice-president and general manager of the company, has been elected president and general manager. Walter J. Flickinger, formerly assistant to the president, has been elected vice-president. Richard J. Bennett, who has been attached to Mr. Punderford's office, has been appointed assistant general manager.

J. K. Punderford

NEW HEAD HAS WIDE EXPERIENCE

Mr. Punderford has been connected with the Connecticut Company or its predecessor in New Haven for 33 years. He is a native of New Haven and went to Yale University. He took the combined electrical and mechanical engineering course and was graduated in 1892. His first job was an electric railway one, assisting in the erection of the power station of the West Haven Street Railway. In the autumn of 1892 he went to Schenectady to take the students' course in electrical engineering then being given in the Edison works, but returned to New Haven and became connected with the Fair Haven & Westville Street Railway, then the largest electric railway property in the city.

At first he was engaged in the track department, but later entered the operating department, and when the company acquired the other electric railways in New Haven and vicinity he was made general manager of the combined system. Later, when the New York, New Haven & Hartford Railroad purchased the property and the other electric railways in the state, Mr. Punderford was retained as general manager of all of the combined properties which now comprise the Connecticut Company.

Mr. Punderford has always taken an interest in association affairs and served a year ago as president of the Transportation & Traffic Association.

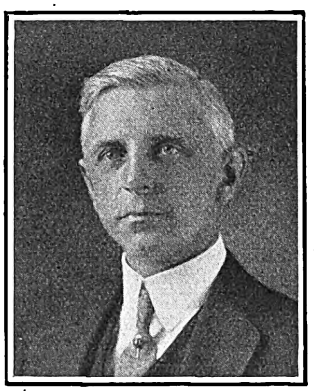
Mr. Flickinger, the new vice-president, has back of him a wealth of experience extending to 1898. In that year he entered the employ of the Lehigh Valley Railroad in the motive power and purchasing departments. Since then he has been connected with only three properties, i.e., the Lehigh Valley Railroad, the New England Investment & Security Company, which he served from April, 1907, to July, 1911, and the Connecticut Company, the employ of which he entered as chief clerk to the president in July, 1911. Since Jan. 19, 1918, he has been assistant to the president of the Connecticut Company.

Mr. Flickinger is one of those men who seek to know all angles of the work of the industry with which they are connected. The post of chief clerk to the president of the Connecticut Company, which Mr. Flickinger took in 1911, was a title only, for from the time that he went with Mr. Storrs to New Haven, it was he who directed all the vast routine of the president's office. Mr. Storrs knew that he could delegate more and more authority to Mr. Flickinger, and his assistant, in turn, never winced at the increased amount of responsibility.

Not only did Mr. Flickinger carry on successfully in the posts of chief clerk and of assistant to Mr. Storrs, but he exercised a lot of independent initiative. He became the contact man with the public authorities and regulatory bodies and to him was allotted the task of inquiring into the many phases of the vast operation of the company. What Mr. Flickinger did not find out himself about the property, he had others find out for him. To him was assigned the work of inquiring into the possible use of the bus by the Connecticut Company at the inception of that movement, and the operation of buses by the company today is very largely a reflection of his foresight and of his appreciation of the more modern methods of conducting and selling transportation. He was chairman of the first committee of the American Electric Railway Traffic & Transportation Association on the use of the bus. A great deal of the credit for the organization of the Connecticut Company Section also is his.

Mr. Bennett has been supervisor of time-tables and attached to Mr. Punderford's office. Before he came to New Haven he was with the Grand Trunk Railway and later with the Canadian Pacific Railway. In 1904 Mr. Bennett entered the service of the Connecticut Company in the office of E. H. McHenry, then vice-president of the New York, New Haven & Hartford Railroad. In 1905 he was made chief clerk in the office of Calvert Townley, then vice-president of the Connecticut Company. Mr. Bennett's close connection with the general manager's office of the Connecticut Company has made him peculiarly fitted for the greater responsibilities that now become his by the appointment as assistant general manager.

It is an indirect commentary on the ability of President Storrs as an executive that he had in his organization men of the caliber of Mr. Punderford, Mr. Flickinger and Mr. Bennett, ready at all times to assume an ever-increasing measure of responsibility and, very largely because of that fact, now prepared to carry on without interruption the work of the company from which he is about to retire as head.



W. J. Flickinger

The Connecticut Company operates 802 miles of track and owns nearly 1,500 motor cars and a number of buses. It serves all of the large cities in the state.

Mr. Woodlock's Name Withdrawn

The nomination of Thomas F. Woodlock, New York, to be a member of the Interstate Commerce Commission will not be submitted to the Sixty-ninth Senate for confirmation. Mr. Woodlock's nomination was contested in the last Senate on the ground that he was closely identified with Wall Street and the nomination failed of confirmation.

A. F. Elkins, at one time auditor of the Columbus, Delaware & Marion Electric Railway, has just been appointed to take charge of the Cleveland office of Peat, Marwick, Mitchell & Company, accountants and auditors. After leaving the Columbus, Delaware & Marion Railway Mr. Elkins went with the Interstate Commerce Commission. For the past few years he has been chief of the railroad section, consolidated returns audit division, income tax unit, Treasury Department, with headquarters at Washington.

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R. M. Hannaford and C. H. Boire Advanced in Montreal

Two important executive appointments were announced recently by Lieut.-Col. J. E. Hutcheson, general manager of the Montreal Tramways, Montreal, Que. R. M. Hannaford, formerly acting chief engineer, has been appointed engineer of maintenance of way and structures and C. H. Boire, formerly chief clerk of the treasury department, has been appointed assistant secretary-treasurer.

The association of Mr. Hannaford with the Montreal Tramways dates back to 1902, when he was appointed assistant engineer with the Montreal Street Railway. His first engineering work was in connection with surveys for the Montreal & Champlain Junction Railway. After this he spent a year in the drafting department of the Phoenix Bridge Company at Phoenixville, Pa. He then joined the engineering staff of the old Grand Trunk Railway first as instrument man and later as resident engineer on the double tracking of the line between Montreal and Toronto. After this he spent 2 years with Pratt & Whitney, Hartford, Conn., on design work, and in 1889 he was appointed chief draftsman with the James Cooper Manufacturing Company. He later became connected with the Montreal Tramways and has remained in that work ever since, with steady progress to his new appointment as engineer of maintenance of way and structures.

Mr. Boire entered the employ of the Montreal Street Railway in 1903 as timekeeper in the accountant's department. When the Montreal Street Railway Mutual Benefit Association was organized he was promoted to the position of accountant in that association and held that position for several years. He was then transferred to the secretary-treasurer's department as chief clerk. This position he held until his present appointment to an executive office as assistant secretary-treasurer for the tramways.

H. S. Earl, Vermillion, Ohio, agent for the Lake Shore Electric Railway, Cleveland, for several years, has been promoted to assistant superintendent of the Cleveland division, with headquarters at Cleveland.

Cornell S. Hawley, member of the executive committee of the American Electric Railway Association and president of the Consolidated Car Heating Company, Albany, N. Y., was elected president of the Albany Chamber of Commerce on Feb. 6.

Judge John C. Denney, Everett, Wash., has been appointed director of the state Department of Public Works of Washington, to succeed Walter B. Whitcomb, who returns to his old position as supervisor of public utilities other than transportation. From this position he was promoted when E. V. Kuykendall resigned as director.

Howard F. Fritch, who was assistant general manager of the Eastern Massachusetts Street Railway, Boston, Mass., but recently accepted a position with the Boston & Maine Railroad as manager of its bus department, has been elected president of the Boston & Maine Transportation Company, the bus subsidiary of the railroad, and has already worked out a bus schedule both for Massachusetts and New Hampshire. He says that for the short routes he will use the street car type of bus, but for the longer routes he will use the larger type that has been adopted by the Boston Elevated Railway.

H. A. Benjamin has been appointed vice-president and general manager of the Des Moines & Central Iowa Railroad with headquarters at Des Moines, Iowa. The appointment, effective Feb. 18, places Mr. Benjamin in charge of both the operating and traffic departments.

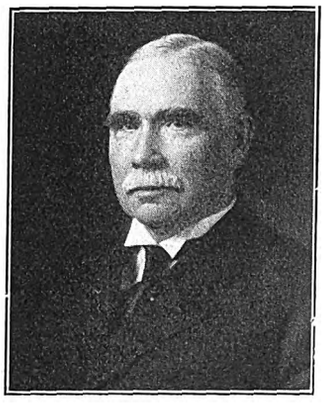
Charles F. Johnson, general manager of the Wason Manufacturing Company, Springfield, Mass., a subsidiary of the J. G. Brill Company, Philadelphia, was elected vice-president of the Wason company at a special meeting of its board of directors on Feb. 18. As vice-president, Mr. Johnson succeeds Austin H. Pease, whose death was announced in the ELECTRIC RAILWAY JOURNAL, issue of Nov. 11, 1924. Mr. Johnson will continue as general manager of the company.

Obituary

Elliott G. Stevenson

Head of Detroit United Railway Was Lawyer with Nation-Wide Reputation

Elliott G. Stevenson, president of the Detroit United Railway, Detroit, Mich., since 1923 and before that acting president of the company for a year, died on March 7 at Coronado Beach, Cal., in his seventieth year, after an illness of only two or three days. For many years before he became operating head of the railway Mr. Stevenson, who was one of the leaders of the Michigan bar, was chief counsel for the company. In fact, it was as chief counsel for the company that he brought to a close the agreement by which the city of Detroit acquired the D. U. R. city lines, and it was to him personally that Mayor Couzens handed the city's check for $2,500,000 as a first payment on the lines.



E. G. Stevenson

Mr. Stevenson had big plans ahead for the Detroit United. It was he who arranged for the financing of the company carried out during the last few years and it was he who saw the need for the greater intensification of the merchandising activities of the company. It was a gigantic task that he set for himself so late in life, this proposed rehabilitation of the properties that remained after the lines in the city had been sold. He threw himself into the work with his usual vigor, but the strain told and he was recently forced to desist and take a vacation. As a practitioner before the bar Mr. Stevenson was accustomed to working single-handed, a method he carried over with him into his railway work, but one that drew heavily upon his mental and physical resources. He was a gracious man, friendly and unassuming, but it was foreign to his nature and to his long legal training to delegate to others tasks which he regarded that he himself could, perhaps, best carry out. He was conscious that he was trying to do too much, and had in recent months gradually worked around to the point where he was intrusting more and more detail and routine to others.

Of recent years, Mr. Stevenson's reputation became national through the two legal battles he fought against Henry Ford. The first was as attorney for the Dodge Brothers, when he compelled the Ford Motor Company to distribute $55,000,000 in dividends. In 1919 Mr. Stevenson was again pitted against Mr. Ford, and this case attracted not only national but international publicity. The Chicago *Tribune* had called Mr. Ford an anarchist in an editorial, and Mr. Ford brought suit for $1,000,000 against the paper, charging libel. This suit was tried in Mount Clemens before the late Circuit Judge James Tucker. The newspaper retained Mr. Stevenson as its Michigan counsel. The Ford libel suit ended in a technical victory for Ford. The jury awarded him damages of 6 cents. Neither side appealed.

At that time Mr. Stevenson was attorney for the D. U. R., which then owned the railways in the city. James Couzens was Mayor, and a crisis developed in the relations between the D. U. R. and the city. Late one afternoon, after Mr. Stevenson had put in a grueling day in the Ford suit, he was called to Detroit to bring the D. U. R. through the crisis. The employees were on a strike, and it was to settle this that the D. U. R. instructed him to fight it out with Couzens, before Judge Adolph F. Marschner. Far into the night the two personalities opposed each other. Fatigue seemed unknown to either, although both were under a tremendous strain. In the early hours of the morning an agreement was reached, and Mr. Stevenson rode back to Mount Clemens and was present when court opened.

Only a small part of Mr. Stevenson's

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extensive legal business resulted in court trials. His attitude was that, as a general proposition, controversies instead of being litigated should be adjusted. In effecting such adjustments, he displayed extraordinary wisdom and skill and thus rendered his clients a far greater and more valuable service than would have been possible had these controversies been successfully litigated.

Mr. Stevenson was born May 18, 1856, in Middlesex County, Ontario, and a few years later moved to Port Huron. He finished school when 16 years old and studied law in the office of O'Brien J. Atkinson.

Herman K. Haupt, for 10 years chief clerk to J. V. Davis, vice-president and general manager of the Washington, & Old Dominion Railway, Washington, D. C., is dead.

Joseph P. Murphy, prominent in the development of Toledo's street car lines, died recently. He was born in New York State and went to Toledo in 1882 from Pittsburgh to become superintendent of the Robinson Street car line.

Charles Thornton Adams, for more than 35 years attached to the legal department of the Interborough Rapid Transit Company, New York, N. Y., is dead.

Charles Y. Kay, for two years vice-president of the Stark Electric Railroad, Alliance, Ohio, died on Feb. 10. Mr. Kay was prominent in business and political circles in Alliance for half a century, and was one of the guiding hands which placed the Stark Electric Railroad in control of Alliance capital. He resigned the vice-presidency and directorship of the Stark Electric Railroad about 2 years ago. Mr. Kay was 73 years old.

Frank S. Briggs, for a number of years claim agent of the Cumberland County Power & Light Company, Portland, Me., died recently. He had resided in Portland 25 years and all that time was employed by the Portland Railroad, which is now a subsidiary of the Cumberland County Power & Light Company. Mr. Briggs was 50 years old.

Franklin Woodman, one of the best known electric railway men in New England, died at his home in Haverhill, Mass., on Feb. 27, after a long illness. He was born at New Gloucester, Me., in 1857 and in early youth was employed by the Metropolitan Street Railway, Boston, Mass., as a gravel car checker. He was soon appointed a starter in the car service and later became superintendent of the Atlantic Avenue and Washington Street horse car service. In 1889 he became superintendent of various suburban lines running out of New Bedford, Mass., but in 1892 took charge of the electrification of the Haverhill & Groveland Street Railway and then of the Lowell, Lawrence & Haverhill Company lines. In 1901 Mr. Woodman was made general manager of the Haverhill & Southern New Hampshire Street Railway and later vice-president and general manager of the Massachusetts Northeastern Street Railway, which post he relinquished about 7 years ago on account of ill health. In 1911 he was president of the New England Street Railway Club.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

McGuire-Cummings Builds Bus Bodies for West Towns Railway

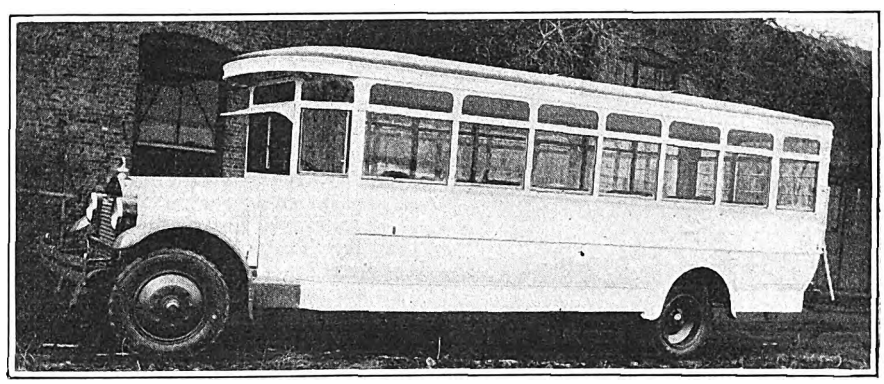
Street car type bodies built by the McGuire-Cummings Manufacturing Company have recently been bought by the Chicago & West Towns Railway, Oak Park, Ill., for five Mack buses. A combination of wood and steel framing is used. Side sills and posts are of ash, flooring of poplar and roof of $\frac{5}{16}$-in. three-ply Haskelite supported on ash carlines.

These bodies have a seating capacity of 26. They are 7 ft. 5 in. wide over the belt rail and the floor is 2 ft. $1\frac{5}{16}$ in. high at the entrance step. The side sheets are 14-gage aluminum. Battleship linoleum $\frac{5}{16}$ in. thick is used as a floor covering. This is cemented to No. 10 cotton duck, which is securely fastened to the floor over $\frac{1}{8}$-in. building paper.

Upper sash are cherry, made up in continuous lengths and fastened to the side posts. Lower sash are brass. The windshield is the Rostand Manufacturing Company's all metal type. Trimmings are nickel-plated bronze and stanchions are 1-in. aluminum pipe fastened into aluminum fittings. All inside finish is cherry. Doors, wainscoting and all moldings are made of this material.

The seats are Hale & Kilburn stationary type, upholstered in leather. Provision is made for a sign box over the windshield, and a curtain is so arranged that it can be pulled down and fastened to the back of the driver's seat.

An exhaust pipe heating system is included, and heater pipes within the body are protected with perforated metal shields. Six dome lights are arranged for interior illumination. In addition there are two front and two rear marker lights and another light at the step opening. The buses are finished in Ripolin enamel.



Bus Bodies Built by McGuire-Cummings Manufacturing Company for Mack Chassis

American Car & Foundry Issues New Stock

W. H. Woodin, president of the American Car & Foundry Company, has commented on the proposed change in the financial structure of the company by which the 300,000 shares of common stock, par value $100, will be replaced by 600,000 shares of no par value stock with voting right for the common of one vote for each two shares. He said that in announcing the proposed change, the directors stated explicitly that it was not expected that there would be any change in the company's dividend policy. On the common stock dividends for some years had been paid at the rate of $12 a year, but there was no reason to expect that the dividend on the common would be less than heretofore.

Metal, Coal and Material Prices

Metals—New York	Mar. 10, 1925
Copper, electrolytic, cents per lb	14.45
Copper wire base, cents per lb	16.75
Lead, cents per lb	9.00
Zinc, cents per lb	7.65
Tin, Straits, cents per lb	53.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.325
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.00
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$7.00
Weatherproof wire base, N.Y., cents per lb.	19.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.17
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.1272
Turpentine (bbl. lots), N. Y., per gal.	0.93

Possibilities of 2½-In. Paving Brick

At the annual meeting of the National Paving Brick Manufacturers Association in St. Louis, Jan. 20, 21 and 22, steps were taken to make a study of the possibilities of 2½-in. brick for street and highway paving designed to accommodate light and medium weight

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traffic. It was stated that in the early days of brick paving ordinarily no foundation whatsoever was used. Occasionally a layer of sand or gravel was used. Nowadays, however, a substantial foundation is employed, and with this development has come the viewpoint that a paving brick wearing surface of 3-in. or 4-in. thickness is unnecessary. Some 2½-in. brick pavements have been in service about 14 years and it is the intention to conduct a survey of their design and durability. Another feature of interest at this meeting was the almost unanimous vote in favor of using asphalt filler rather than cement grout filler between paving bricks.

Rolling Stock

Knoxville Power & Light Company, Knoxville, Tenn., recently placed orders for 16 new double-end safety cars at a cost of $130,000. The new cars will be 30 ft. long and will seat 30 people.

Hartford & Springfield Street Railway, Warehouse Point, Conn., is adding three Mack city-type buses to its equipment. Two have seating capacities of 29 passengers and one 25 passengers.

Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, plans to order seven new safety coaches to be placed in service over the Union City to Dayton branch, on which the commission recently authorized abandonment of railway service.

Springfield Street Railway, Springfield, Mass., expects delivery shortly on four new Garford buses. One of these is equipped with a Superior body. The three others are being fitted with bodies at the Wason Manufacturing Company plant of the J. G. Brill Company in Springfield.

Madison Railways, Madison, Wis., has announced specifications on six new cars, which will be placed in service some time during the summer of 1925. The details of these cars are as follows:

Date order was placed	Feb. 21
Builder of car body	American Car Company
Type of car	Single truck, safety
Seating capacity	30
Total weight	17,250 lb.
Length over all	30 ft. 1 in.
Truck wheelbase	8 ft.
Width over all	8 ft. 2½ in.
Height, rail to trolley base	12 ft. 5 in.
Body	Steel
Interior trim	Cherry
Roof	Arch
Air brakes	General Electric
Car signal system	Consolidated
Control	General Electric
Destination signs	Hunter
Door-operating mechanism	National Pneumatic and American Car Company
Fare boxes	Cleveland
Gears and pinions	General Electric
Heater equipment	Consolidated
Motors	Two GE—264, inside hung
Paint	Sherwin-Williams Old Dutch Enamel
Seats	Hale & Kilburn
Seating material	Rattan
Slack adjuster	Brill
Trolley catchers	Ohio Brass Company
Trolley base	Ohio Brass Company
Trolley wheels	More-Jones

Los Angeles Railway, Los Angeles, Cal., has placed orders for four more double-deck buses. Two will be made by the Fageol company and delivered March 15; the other two are to be made by the Moreland plant for delivery April 15. This new equipment will be used on Wiltshire Boulevard line. This will provide double-deck buses exclusively for this line, releasing the single-deckers for other service.

Track and Line

Monongahela-West Penn Public Service Corporation, Fairmont, W. Va., will rehabilitate its tracks on Putnam and Second Streets in Marietta, Ohio. The work will begin probably by April 1.

Trenton, Hamilton & Ewing Traction Company, Trenton, N. J., will install a crossover, switches and frogs on the West State Street Division. Permission was granted by the Trenton City Commission.

Stockton Electric Railroad, Stockton, Cal., has been granted a certificate by the Railroad Commission to construct and operate a railway from the intersection of Wilson Way and East Main Street to the east city limits, a distance of approximately 5,750 ft. The authorization was made under a franchise granted by the city of Stockton.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has applied for permission to build a new interurban to extend west from 35th Street, Milwaukee, to connect with the Waukesha-Watertown interurban near West Allis. The line will cost $700,000 to build. It will run over a private right-of-way to obtain faster time to Waukesha, Oconomowoc and Watertown by avoiding the long runs over city streets through West Allis. S. B. Way, vice-president and general manager of the company, regards this project as one of the most important extensions of the company's lines into new territory that has been made for several years. Construction of the new line will begin this spring if the Railroad Commission approves the plan.

Power Houses, Shops and Buildings

Sacramento, Cal.—Permit has been granted for construction of the proposed new $54,486 terminal of the Sacramento Northern Railway. The building will be the combined terminal of all the electric lines operating in Sacramento. George D. Hudnutt is contractor.

Monongahela-West Penn Public Service Company, Fairmont, W. Va., plans to spend $1,000,000 in improvements and developments during the next year in the Fairmont and adjacent regions. One item on the list is a substation in Fairmont to take the place of the existing plant.

Aurora, Elgin & Fox River Electric Company, Aurora, Ill., will erect a $325,000 carhouse on South River Street, south of North Avenue, in Joliet. General Manager Egolf has asked the city to vacate streets and alleys in the vicinity of the proposed improvement. The carhouse will have a capacity for more than 100 cars.

Trade Notes

Bradford H. Whiting has severed connections with the Whiting Corporation, Harvey, Ill., and its subsidiary, the Grindle Fuel Equipment Company. Mr. Whiting has given up his directorship in each of the companies and also resigned the offices of vice-president and general manager of the Whiting Corporation and president of the Grindle Fuel Equipment Company.

Johnson Fare Box Company, Cleveland, Ohio, announces the installation of a complete equipment of registering boxes on the city system of South Bend, Ind., operated by the Chicago, South Bend & Northern Indiana Railway. The installation was made when the new fare of 7 cents cash or four tokens for 25 cents recently went into effect.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., announces that W. H. Ivers has rejoined its organization as Southwestern sales representative. Mr. Ivers was connected with the Gold company from 1916 to 1921 in the Southwestern territory. Prior to that he was in Philadelphia with the Baldwin Locomotive Works. He comes back to the Gold company after having rounded out his experience by 3½ years as sales manager for the A. Gilbert & Sons Brass Foundry Company, St. Louis, a fast-growing concern engaged in the manufacture of bearings and bearing metals for railway uses.

Hisey-Wolf Machine Company, Cincinnati, Ohio, has announced reduced prices on Hisey electric tools effective Feb. 16 per price list No. 30. Electric drills of the most popular sizes have been reduced from 12½ per cent to 17 per cent and many other price reductions from 5 per cent to 10 per cent have been made.

New Advertising Literature

Pittsburgh Testing Laboratory, Pittsburgh, Pa., has issued bulletin 35, entitled "Better Foundry Sands."

International Steel Tie Company, Cleveland, Ohio, has issued a 24-page illustrated pamphlet on new construction methods for renewable paved track.

Hubbard & Company, Pittsburgh, Pa., has issued catalog 24, which contains a complete list of the company's pole line hardware and construction specialties. Information is included regarding the manufacture of the various part and specifications for hot-dip galvanizing of iron and steel. The catalog is illustrated. It contains 192 pages.

White Company, Cleveland, Ohio, has issued an attractive and interesting silver anniversary edition of its transportation magazine, the *Albatross*, featuring a quarter century of White transportation. The book in a large way is a history of the automotive industry. It contains a vast amount of information and reviews the progress made by this well-known truck and bus manufacturer from 1900, when the first White truck was built.

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New York, Saturday, March 21, 1925

Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review
Published by Mc-Graw-Hill Company, Inc.
MORRIS BUCK, *Managing Editor*

Volume 65 *Number* 12

Annual Maintenance Number

The Maintenance Man Has a Real Job Today

MORE substantial progress has been made by the electric railways in the past two years than in any similar period of the industry's history. Business has increased, fares have been brought to the point where the average road can be made self-sustaining, and the financial structures of many properties have been strengthened. In a material way, too, the electric railways have come forward. Many new cars have been bought and much track has been built and rebuilt. Today the physical plant is in better condition than it has been for a decade or more.

Maintenance is the major problem that faces the industry today. For a short time, just after the various parts of the plant are renewed, they will work well even though but little attention is paid to repairs. If the railway systems are to be kept up to their present high standards, however, it will be necessary to pay more and more attention to maintaining the plant that has been built up in recent years, so that it will not fail to give its full measure of service.

In this lies the field of usefulness of the trained man who has made a study of problems of maintenance, and of methods of doing better work in less time and at lower cost. It is a real man's job. New cars and new track have brought with them changed problems. The maintenance methods of a generation ago are of little or no value today.

The leaders in the maintenance field are all the time developing methods which are fitted to present-day conditions. These are accomplishing the results sought and are providing a goal for others.

It is not so easy to be a follower, to adopt the methods that have been developed by another. But the wise leader is also a good follower. Not only is he at work on the development of new methods, but he is also reaching out into the field to draw to himself the best methods that have been worked out by others, changing them only if necessary to fit the conditions of a particular property.

Given a property, even though a poor one, the right sort of a maintenance man can find much to do, and he can reduce costs for his company so as to redound to his own credit. If he does his work faithfully and achieves results, the management should see to it that he receives a fitting reward in the way of remuneration and of promotion. For it is only by having an incentive that a man will put forth his best efforts and so obtain the best results.

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Good Roadbed Maintenance an Important Factor in Interurban Popularity

DESPITE all that has been said of how the automotive vehicle has revolutionized the riding habit of the American citizen, the fact remains that the operation of commodious cars on smooth steel rails first gave him his taste for luxury in travel. Nothing has yet been developed to equal them in spaciousness and easy riding quality. Automobiling is extremely pleasant when the weather is fair and the road is good. By this means one can often reach attractive spots that are inaccessible by rail. Yet when all is said and done, if one takes a trip of any considerable length there is far greater comfort from a ride in a vehicle with steel wheels running on steel rails than in one with rubber tires running over the average highway.

A smooth roadbed well ballasted and well maintained is the greatest asset any interurban line can have. Possessing it, the electric railway can provide a service that has definite advantages over that of the automobile or the steam railroad. Usually the steam railroads make no particular attempt to attract passenger traffic between cities comparatively close together. The interurban railway, with more frequent service and equally commodious cars, is in a good position to secure much of this business. Compared with the automobile, the interurban is unquestionably cheaper and offers a more spacious vehicle operated over a smoother roadway.

It is surprising to see how some interurban managements throw away the great inherent advantage of steel wheels running on steel rails. By neglecting properly to maintain their track and roadbed they allow the surface of their rails to become so uneven that much of the pleasure of riding is lost. Often the same companies are careless about the maintenance of their rolling stock. What ought to be a pleasant ride, swift, quiet and comfortable, becomes an ordeal during which the passenger must endure the swaying, jolting, banging, rattling and creaking of a car operated over rough track.

Where such conditions exist it is not difficult to see why people prefer to travel by automobile or by steam railroad. This condition is not by any means true of all interurban lines. But on a considerable number of properties more attention should be paid to the matter of roadway maintenance.

Better Bus Maintenance in Railway Operation

ON MANY electric railways bus maintenance has now become a problem of considerable importance. Just as there is no ultimate economy in allowing track or rolling stock to deteriorate, there is none in neglecting the upkeep of buses. The necessity for adequate maintenance is sometimes overlooked. In reality it is of even greater importance because the bus is subjected to greater vibration. From its very nature the internal combustion engine racks the bus body and chassis more than the electric motor does the body of a street car. The weaving of the chassis frame due to inequalities in the road is another inherent cause of vibration.

One of the advantages of co-ordinated bus and railway service is that the railway managements are already thoroughly familiar with the necessity for and general problems of shop organization and rolling stock maintenance. They know that it is necessary to have a systematic plan, adequate facilities and to keep accurate records. Moreover, their resources are such that it is possible for them to provide these things.

As yet the bus is too young for maintenance to have become thoroughly standardized. A number of smaller railways have facilities for making repairs in existing carhouses. Where bus operation has replaced car operation, or where it has been possible to transfer cars to some other location, in some cases carhouses have been converted into bus repair shops. But generally speaking, the railways have provided buildings designed for garage purposes.

Bus maintenance personnel is ordinarily separate and distinct from the car maintenance personnel. This is largely because the equipment of the bus is so different from that of the car that its proper care requires men with specialized training.

Inaccessibility of parts has been one of the difficulties of bus maintenance. This is a matter that deserves careful consideration. Within a comparatively brief time, however, the bus has changed from being simply a body mounted on a truck chassis into a vehicle designed especially for passenger transportation, and it is not unreasonable to expect that as time goes on other improvements will come in the design to make maintenance cheaper and easier.

Reduction of Noise Is a Good Investment

THE interest being taken in the reduction of noise in street car operation cannot fail to mark the beginning of a new era. This subject must be taken seriously. Competitive conditions demand it, and the cost of noise reduction ultimately will be justified by actual savings effected as well as in the intangible valve in good will and increased revenue that may be laid to quieter operation.

A decided improvement in existing conditions is not impossible, nor even especially difficult. Consider the properties of today. Those that keep their track and equipment in good condition have the quietest operation. As pointed out in another editorial in this issue, the greatest wear comes from rubbing between parts that are not tightly held together. Is it to be wondered that a car with loose parts is disagreeably noisy? Practices that permit these conditions cannot be justified. Yet they do exist. It takes money to rectify them now. But if the necessary money be spent to correct them, is there any doubt that in the end real economy will be shown?

The justification for bringing the standards of maintenance to the highest plane is readily apparent to the mechanical man. It exists not only in the reduction of noise but in longer life of the parts. Higher maintenance standards, as applied to noise reduction, mean essentially closer fits. This in turn means less vibration and sound. It also means that these close fits will be maintained longer. This latter statement is demonstrable by test. The proportional added expense to secure higher standards of maintenance as compared with the value of the added life of parts has not been worked out, but it is doubtful if the net cost will be much if anything. There may even be a reduction in expense.

Some of the maintenance factors which will contrib-

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ute particularly to reducing car noise were discussed in an editorial in the Feb. 28 issue of the JOURNAL.

As to changes in design, there is a wide field for endeavor. So long as steel wheels roll on steel rails there will be some noise, but the amount of that noise is capable of material reduction. Modern design of trackwork has tended toward rigidity. Car design has had a similar trend. Both of these aggravate the noise. Body and equipment noises by themselves are of relatively minor consequence now, because their volume is less than that of track and wheel noises. But if the latter are reduced to a minimum, these other noises will stand out more prominently, so that they should not be neglected. For both classes of noises there are remedies. Steps have been taken in individual cases to eliminate several of the sources. While they are experimental as yet, there is no inherent reason why a concerted effort should not be made to bring together all the plans that have been proposed and work out a real campaign for promoting quietness in operation.

In the quest for economy we have perhaps forgotten that we have something for sale that must be made popular—not only to the riding public, but also to the listening public along the car routes. In the end these are the potential riders who can be attracted or repelled by what they see and what they hear. So it would seem that as a question of policy the problem of noise should be attacked and conquered, entirely apart from the value of quietness from the mechanical standpoint.

Good Maintenance Is Cheap Maintenance

NOWHERE is the old adage "A stitch in time saves nine" more apt than in connection with electric railway maintenance. Vibration and rubbing between adjacent surfaces are major causes of failure in many parts of railway track and equipment. Rail joints that are tight never give any trouble; but let the joint begin to loosen, and motion between the rails, the joint plates and the connecting bolts is accelerated until within a short time it is impossible to make a satisfactory repair by any method short of cutting out the joint and inserting a new piece. Meanwhile vibration has broken the paving and the foundation. The same thing is true of car parts. Fitted joints in bodies, trucks or motors give no trouble until there is a slight tendency to looseness. Then chafing ensues and causes the abutting surfaces of the parts to wear away, increasing the trouble rapidly until they fail completely.

Accidents are often caused by the practice of letting the maintenance go until the wear has reached a point that it is considered unsafe to wait any longer for a repair. Sometimes the judgment of the inspector is faulty in that the repair is deferred until long after the danger point has been passed and the factor of safety wiped out.

Then, too, the cost of the repair, when it finally is made, increases much faster than in proportion to the length of time the work is deferred. A loose joint in a car part requires only tightening a few bolts when it is first observed. A little later it may require an expensive building up of the parts with the welder, followed by machining of the adjoining surfaces Usually this will require disassembling of the parts so that the work may be done, followed by a reassembly, with a considerable waste of labor.

Why a management can imagine that deferring maintenance saves money it is difficult to see. Yet the practice is indulged in by many roads every time there is a call for drawing down on the pursestrings. The number of trainmen cannot be reduced, nor can their pay be cut without the possibility of labor troubles. Maintenance work can, however, be partially neglected for a time without anyone being the wiser. Sooner or later it will be necessary to pay the piper—and the charge will not be a light one. It is far better to have the maintenance work done well, and done when its need first becomes apparent. The saving will be obtained not only in a direct reduction of maintenance costs, but in better performance on the street and a reduced number of interruptions to service. The cost of items such as these can never be measured directly; but it is a factor that always enters in the final analysis.

Central Master Mechanics Would Improve Their Work

IN THIS ISSUE is reported the organization of the Central Electric Railway Master Mechanics' Association. Its purpose, as expressed by representative speakers at the meeting, is to study and compare methods and practices so as to enable the mechanical men to serve better the roads on which they are employed —to enable them to improve their work.

The master mechanics contend—and rightly so—that upon them rests a very important part of the responsibility for maintaining a satisfactory interline business. They believe that greater uniformity in equipment design and maintenance and in inspection standards will bring about improved service to shippers and reduced costs to the carriers. They point out that it is imperative to reduce delays while waiting for special maintenance parts and transfer of shipments due to defective equipment.

To these objectives the new organization has been dedicated. If the executive committee approves the proposal the members of the new association will be affiliated with the C.E.R.A. much in the same way as are the Central Electric Railway Traffic Association and the Central Electric Railway Accountants' Association. The master mechanics expect to hold some of their meetings at various railway shops in the territory, so that they can compare and discuss practices at first hand. The new plan, it is claimed, will save time and produce more concrete results than has the Engineering Council, where maintenance-of-way and power distribution subjects were considered, as well as equipment practices.

The plan includes many potential possibilities for effective and constructive activity guided by group thinking and effort. The leaders in this movement are to be commended for their initiative and progressiveness. It is unfortunate that they felt the results desired could not be accomplished through the present Engineering Council, even with some modifications in its organization. But if the new plan helps the master mechanics to improve their work, the maintenance-of-way and power distribution men may follow a similar procedure. After all, the results are the only factors that are of importance—the mechanism is incidental.

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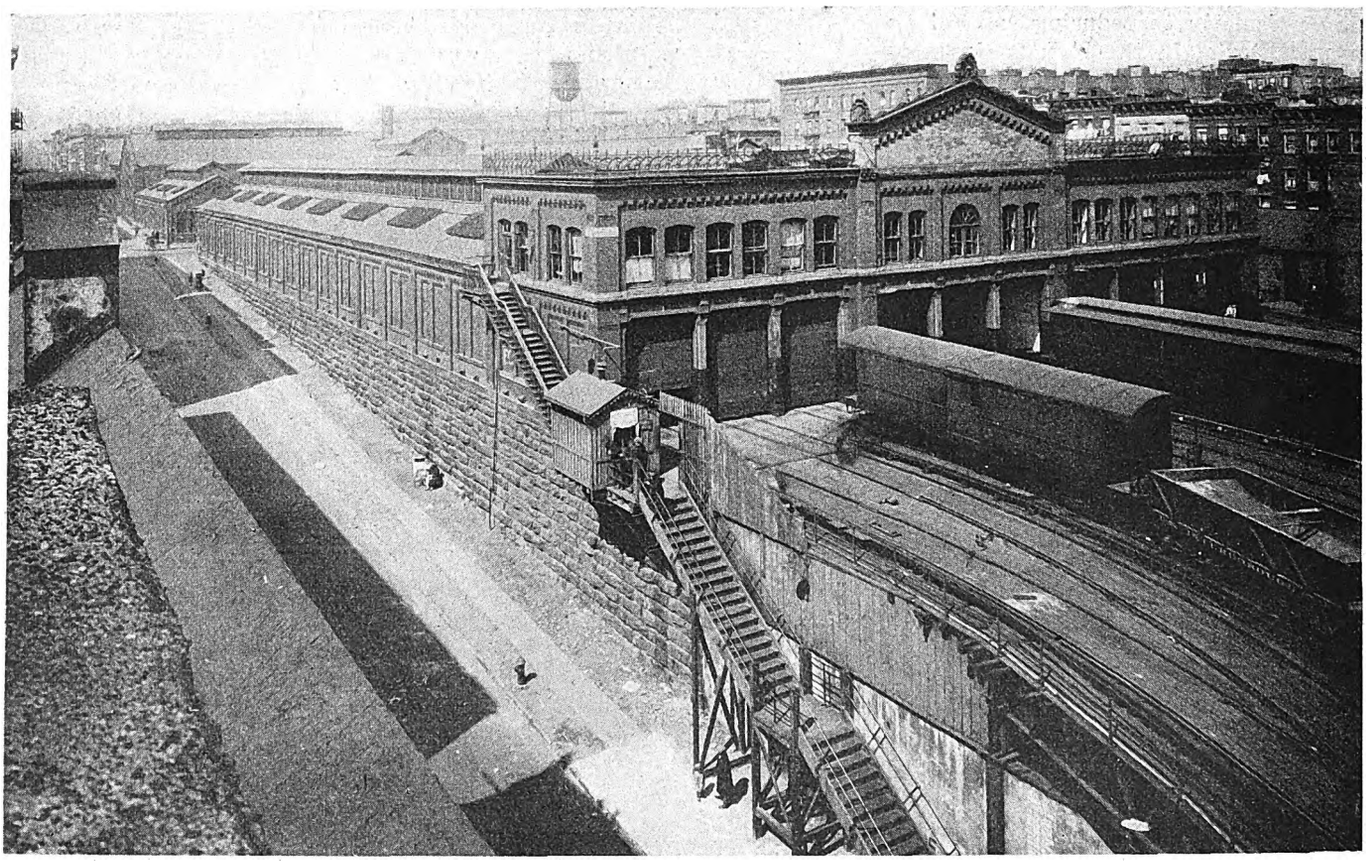
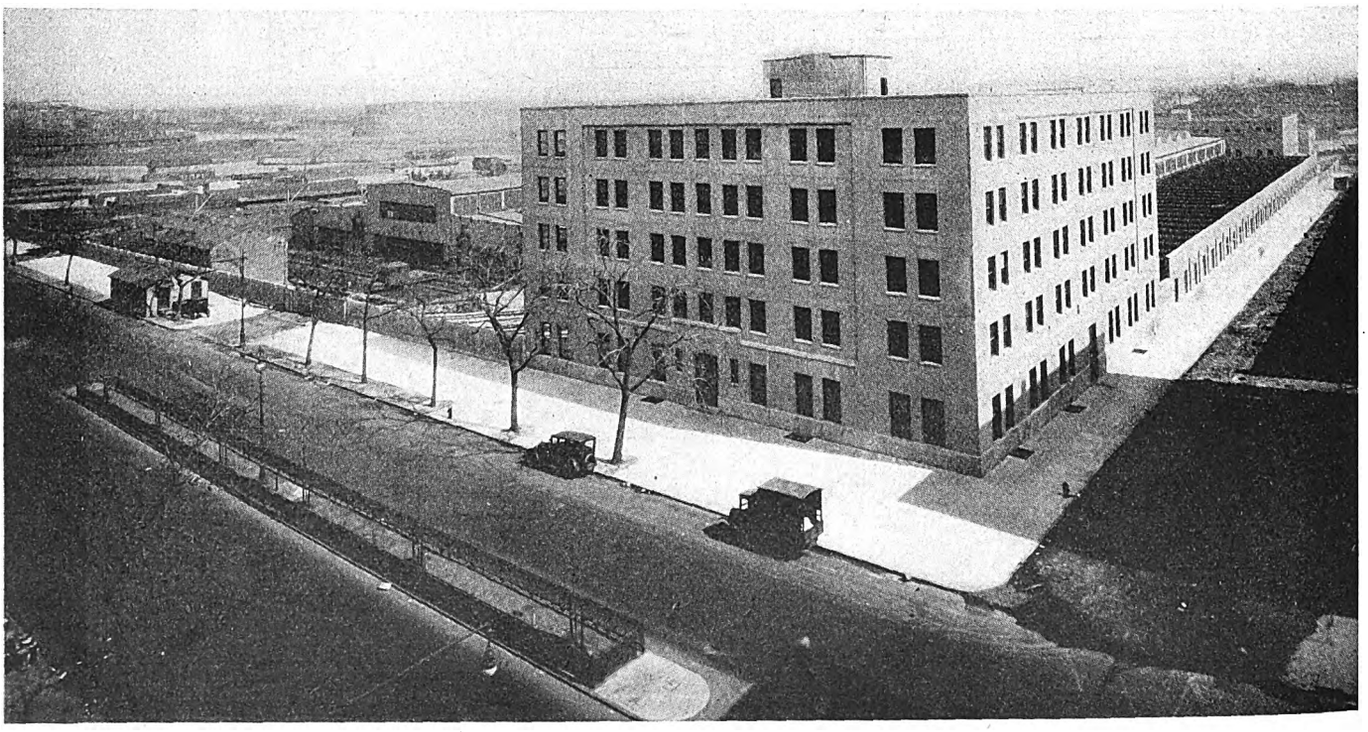


Repair Shops of the Interborough Rapid Transit Company

THE Interborough Rapid Transit Company has two main repair shops. The one shown in the upper view is that originally used by the Manhattan Elevated Railway. It is between 98th and 99th Streets on Third Avenue and occupies the greater part of two city blocks. The yard on Third Avenue is on a level with the elevated structure. The lower view shows the new shops and the office building at 147th Street and Seventh Avenue. These shops, yards and storage space, when completed, will extend along the Harlem River from 145th Street to 151st Street, with western frontage for part of the property on Lenox Avenue and for part of the property on Seventh Avenue. Of the detail views accompanying this article those on pages 442 to 445 inclusive were taken at the 98th Street shops, and those on pages 447 to 449 inclusive were taken at the 147th Street shops.



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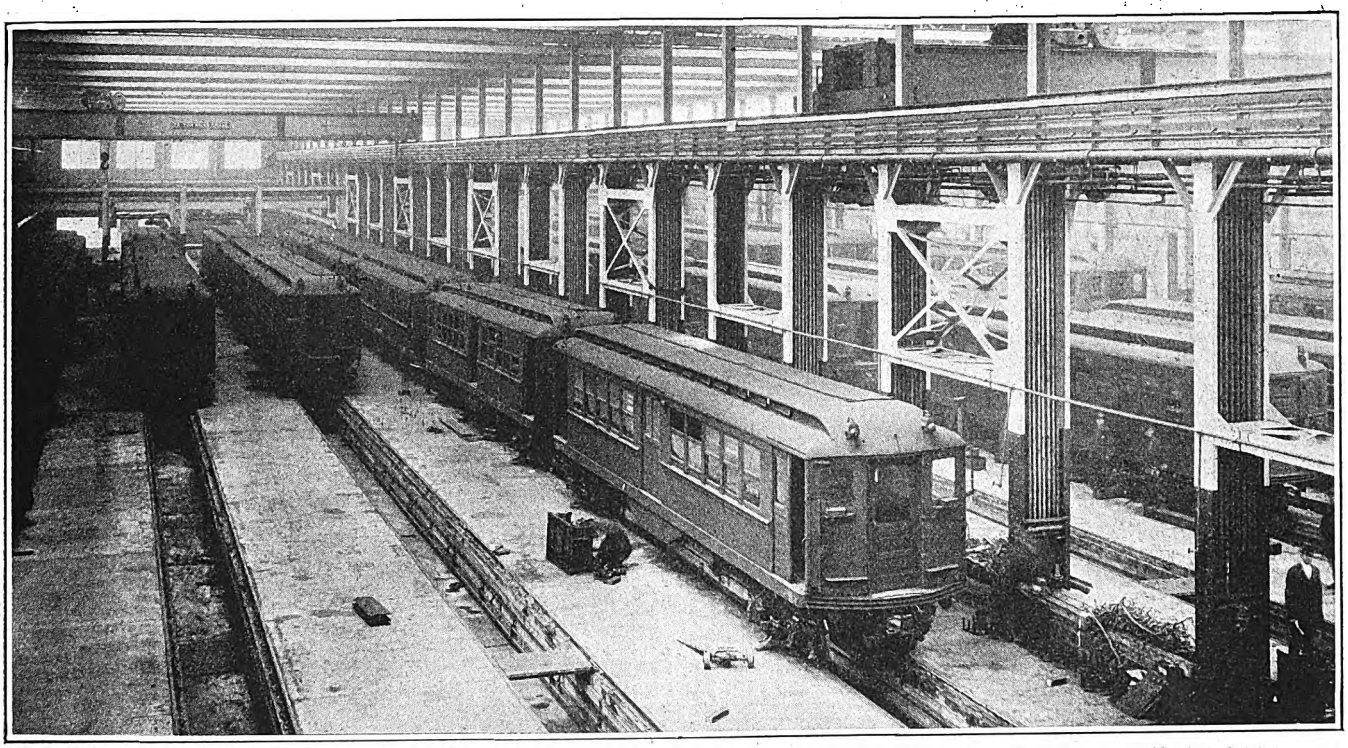
Maintenance Methods on the Interborough

Under a Most Exacting Service, an Efficient System of Car Maintenance Has Been Built Up, by Which Delays per 1,000,000 Car-Miles Have Been Kept to a Low Figure



One of the Inspection Bays at the 147th Street Shops

THE immensity of the task of maintaining the rolling stock of the Interborough Rapid Transit Company can be gathered from a few statistics of the traffic conducted, as compared with trunk-line railroads. During the calendar year of 1922, the last year for which statistics of this kind are available, the entire revenue-passenger business on the steam railroads or trunk-line railroads of the country (Classes I, II and III) reporting to the Interstate Commerce Commission amounted to exactly 989,509,000 passengers, and it is estimated that the few small roads outside the jurisdiction of the commission would not be sufficient to make an aggregate of 1,000,000,000 passengers. During the same year, however, the twelve months ended Dec. 31, 1922, the number of passengers carried by the Interborough Rapid Transit Company was 1,001,730,481. This number was divided approximately two-thirds on the subway division and one-third on the elevated division. Yet this number was carried practically without accident. The figures of passengers carried by the Interborough for 1923 and 1924 are given in Table I.

THIS ARTICLE describes the nature and extent of the repair problem, the methods followed in carrying out repairs and the organization by which this work is conducted in the shops of the Interborough Rapid Transit Company of New York. Previous articles on the repair shops, inspection methods and inspection shops of this company appeared in the issues of May 3, 1924; Aug. 16, 1924, and Aug. 30, 1924.

TABLE I—PASSENGERS CARRIED BY THE INTERBOROUGH RAPID TRANSIT COMPANY

	1923	1924
Subway	693,069,053	729,029,664
Elevated	355,143,240	357,528,667
Total	1,048,212,293	1,086,558,331

The extent of the operations of the Interborough Rapid Transit Company can be indicated in another way. Each month this company operates between 15,000,000 and 17,000,000 car-miles. This mileage is more than that which would be taken by the operation of a subway car 20 times around the circumference of the earth at the equator every day for a month.

It is not only in number of passengers carried and car-miles run that the performance of the Interborough Rapid Transit lines is remarkable. The service conditions are probably the most severe in the world. Trains made up of steel cars, weighing between 38 and 40 tons each, have to be started, brought up to full speed and then braked to a stop, all day, at intervals of only about 1½ to 3 minutes. Frequently on the subway individual cars average more than 5,000 miles per month, and during this time they have to make from 12,000 to 15,000 starts and stops. Again, if a car develops a defect after it has been put in service in a train, it cannot easily be cut out and put on a siding or hauled on a branch track to the repair shop, as would be the case with a line operating on the surface. If it breaks down entirely it delays not only its own train but every

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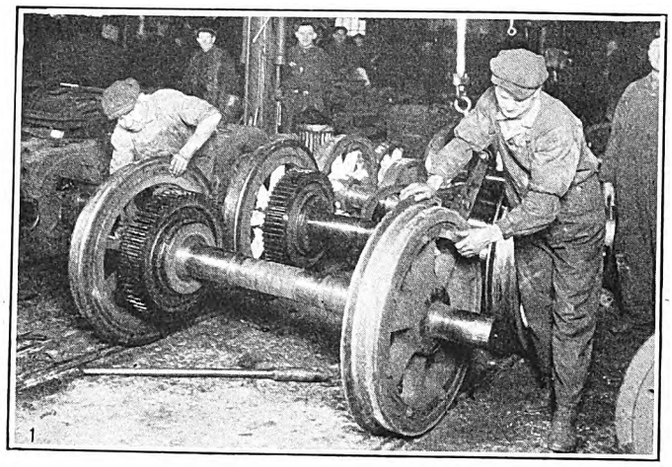

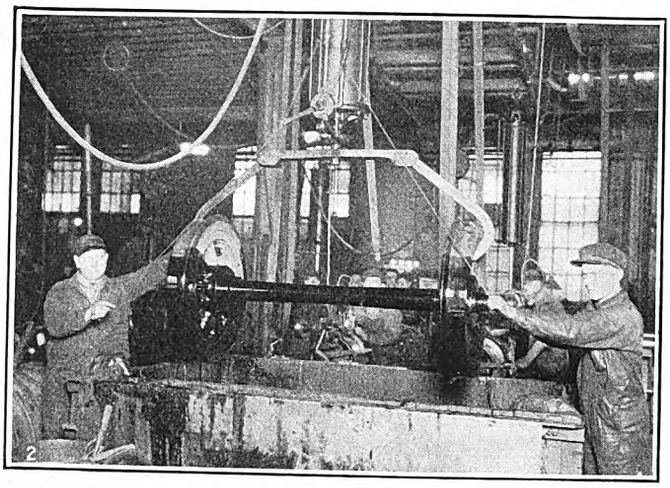

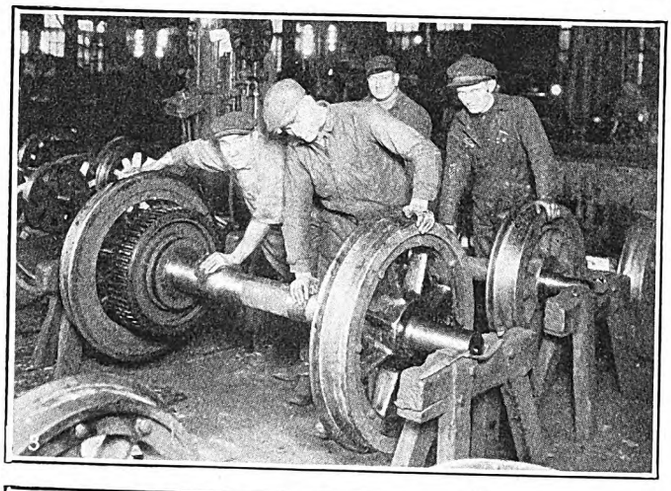

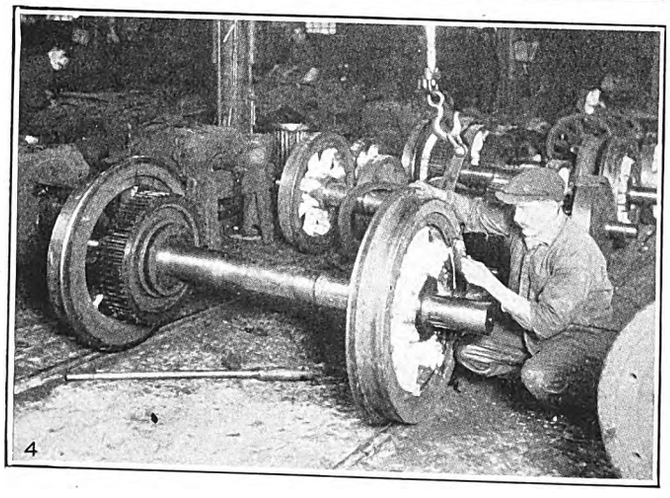

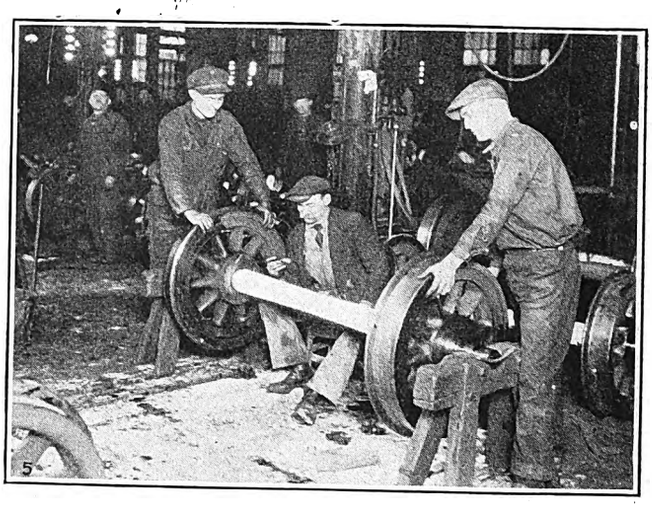

other train on the same track behind it and means a large loss of fares, as well as discomfort to the travelers. This demands that, in spite of the tremendously arduous railway conditions prevailing in subway operation, breakdowns from mechanical defects and pull-ins have to be kept practically to zero.

Finally, unlike most surface lines, rapid transit lines exist only where population density is high and where, in consequence, real estate is very expensive. This means that the repair shops and maintenance shops have to be designed to permit the smallest amount of space per car with which the maintenance department can get along. Added to all of these conditions which face the Interborough Rapid Transit Company, the city of New York, which is responsible for providing the necessary shop and inspection facilities under the dual contracts, is far behind in this part of its program. It is true that now, after long delay, the shop and inspection facilities of the company are being extended by the city, as described in the previous articles referred to, and an especially needed extension of the repair shops at 147th Street and Lenox Avenue for the subway division is now in course of construction. When this is completed, some time during this year, it will help the situation greatly.

In the meantime, of course, the company has not been able to wait for these new facilities and has had to conduct both inspection and repair work as best it could. In these circumstances, the low record of the company in delays per 1,000,000 car-miles from mechanical and electrical causes, as shown in the upper chart on page 444, is remarkable.

Careful records are kept of the number of cars shopped for different causes. The charts shown on page 444 are typical records of this kind.

Table II shows car-miles operated on the two divi-

The Five Illustrations on This Page Show the Methods of Inspecting Wheels by the Vibration Test and Magnifying Glass

As explained in the text, a great deal of study has been given by the engineers of the Interborough Rapid Transit Company to methods of testing wheels, axles and pinions. The five accompanying views show the processes used when the wheels come into the repair shop. (1) The dirt is scraped and wiped off. The axle is then immersed in a lye tank for 30 or 35 minutes, and then thoroughly cleaned with waste. (2) It is then put in a hot bath of oil, and (3) then wiped clean and dry again. (4) The axle, wheel and spokes are then coated with whiting and the axle is vibrated with a hammer. (5) It is then carefully examined with a magnifying glass for evidence of detail fractures. Any crack is usually at the junction of the wheel and axle. Three of the views show a motor axle and two show a trailer axle. Both are treated in the same way.

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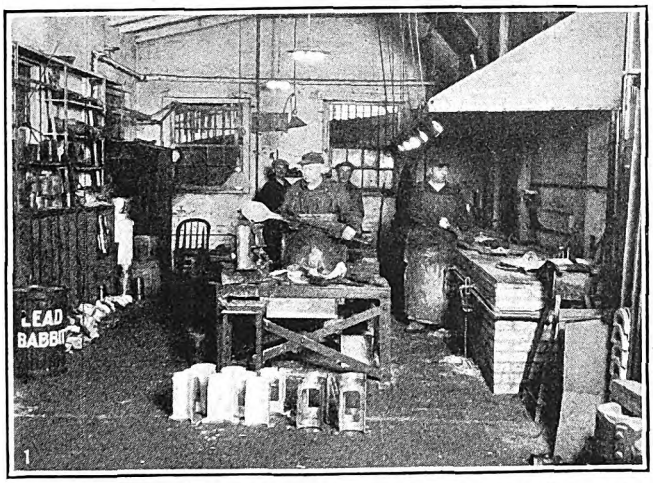
sions for the 14 months ended with February, 1925. Table III gives the number of cars owned last fall, i.e., not including those on the recent order.

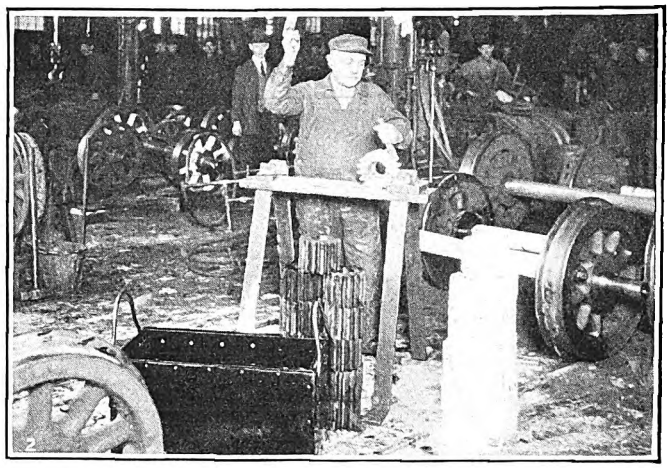
ORGANIZATION OF MECHANICAL DEPARTMENT

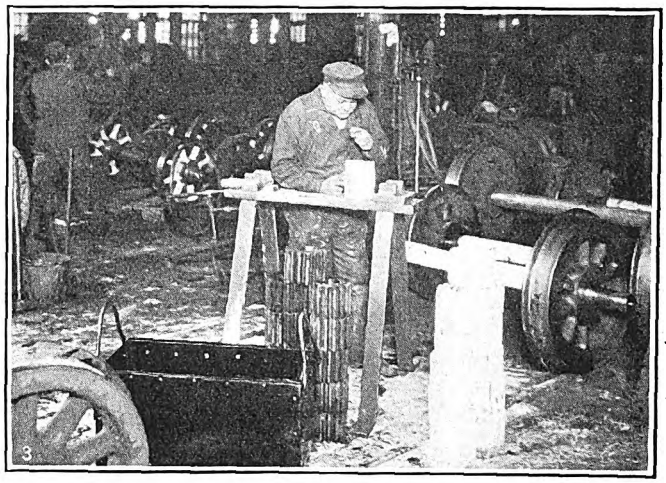
The car equipment department of the Interborough Rapid Transit Company is headed by a superintendent of car equipment, who is also assistant to the general manager. The fact that the head of the mechanical department is thus also in close official connection with the highest councils in the company shows the importance in which good maintenance is held on the Interborough and the authority which it is realized he should have. This official, James S. Doyle, has charge of all of inspection, maintenance, construction and engineering of rolling stock on both the elevated and subway divisions.

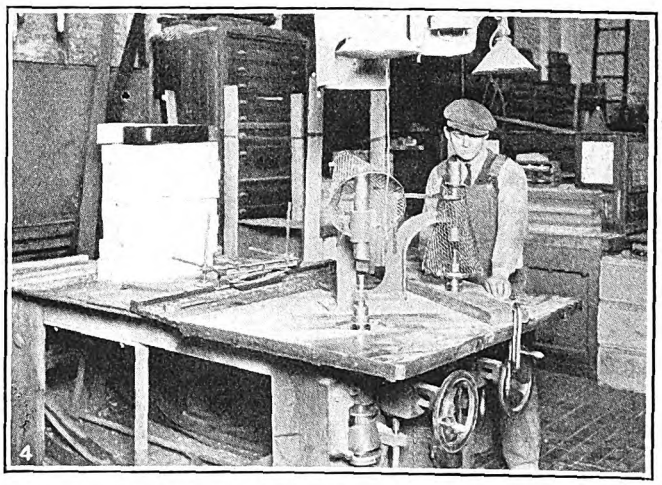


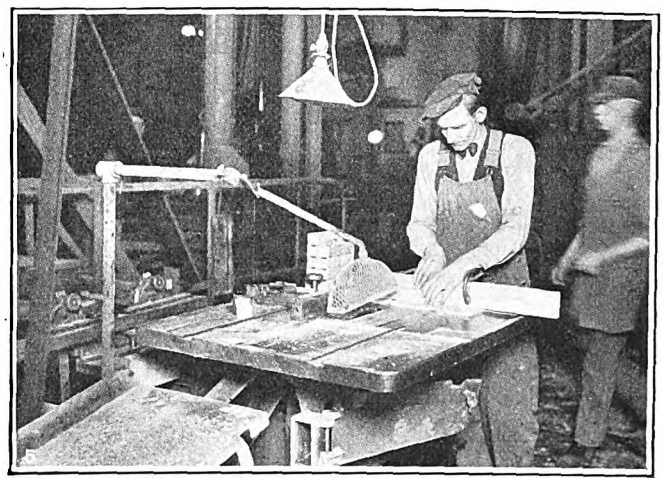
The company makes a distinct separation between its inspection work and its repair and overhaul work. The inspection is conducted in nine special inspection shops, located at different points in the system, as described in the previous articles mentioned. In these shops all cars are inspected on a mileage basis, the motor cars after every 1,000 miles and the trail cars after every 1,200 miles.

The repairs, except such light repairs as are carried on at the inspection sheds incident to inspection, are done at one of the two repair shops of the company. The subway rolling stock goes for all repairs except painting to the shops at 147th Street and Lenox Avenue, now being doubled in size. The cars for the elevated system are repaired at the shops belonging to the Manhattan Elevated Railway at 98th Street and Third Avenue. All painting of cars is also done at these shops. A considerable number of the executives connected with the maintenance department of the company have their









The Five Illustrations on This Page Show Babbitting, Pinion Testing and the Safety Features of Mill Practice

The first view shows the babbitting room at the 98th Street shops. The babbitt furnaces, the pyrometer and the racks for bearings of different sizes are at the right. There is still a larger babbitting room at the 147th Street shops. The next two views show the method of testing new motor pinions by the vibration method. It is very similar to the method used for testing wheels, as described on the opposite page. View 2 shows the blow being given to a pinion coated with whiting. Below are piles of coated and uncoated pinions and an oil bath tank. View 3 illustrates the examination of these pinions with the magnifying glass. Views 4 and 5 are from the wood mill in the 98th Street shops. The machine in View 4 is a variety molder and shaper. Note the mandrel which slips over the end of the shaft to hold it in place. Note also the safety guards over the revolving parts. These guards are so arranged that while they can be raised they cannot be removed from the machine. View 5 is of a circular saw and also shows a guard so arranged that it cannot be removed from the machine.

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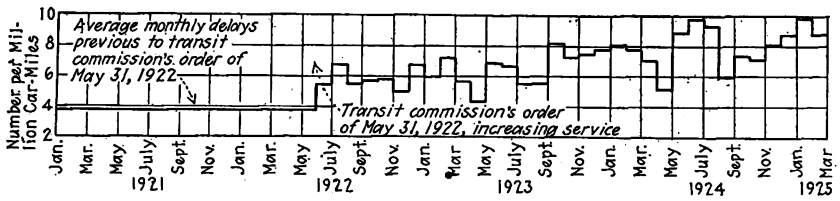
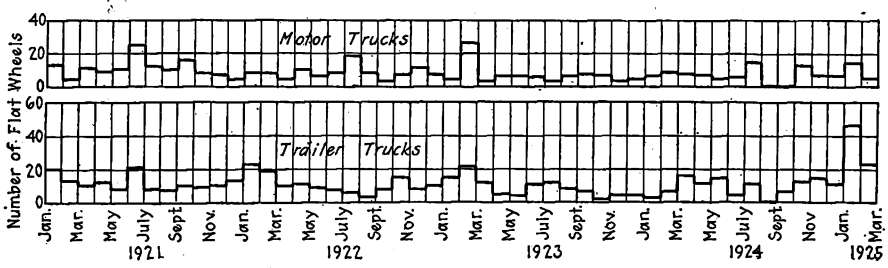
offices at the shops at 98th Street and Third Avenue, and here also is the office of the superintendent of car equipment.

At these shops each car on the system is thoroughly gone over at least once a year, at which time all necessary repairs are performed. In addition, the heavy repairs, which, because of their character, are such that they cannot be advantageously performed at the inspection and running repair shops, are also carried on in these shops.

The principal causes for which cars are sent from the road to the repair shop, except at overhauling times, are: Armature and field trouble, wheel turning, worn journals or truck repairs, heavy car-body repairs and painting.



Delays Due to Electrical and Mechanical Causes—Subway Division



Wheels Flat—Manhattan Division. The Upper Drawing Is for Motor Trucks, the Lower Drawing for Trailer Trucks

When a car comes into the repair shop, regardless of the nature of the trouble, a careful inspection is also made of the car body, including brake rigging, interior of body, platforms, roofs, sills, body bolsters, and control apparatus. If any defect is discovered the necessary repairs are made. In addition, a regular schedule is carried out with all cars.

Car Wiring Tests at Repair Shop

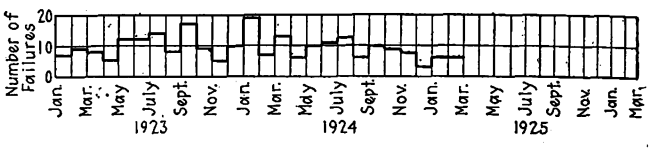
The control apparatus and car wiring are subject to the following inspection and tests as cars go through the shop.

The controllers are inspected, and if any worn fingers are found they are changed and new fingers are installed and adjusted. If any controller cylinders are found with worn or loose segments, they are removed and sent to the machine shop for repairs. The finger blocks and arc chutes are thoroughly cleaned and any necessary repairs are made. All mechanical parts such as shafts, pinions, gears and levers are repaired and readjusted, where this is needed.

All contactors are tested and inspected, and all worn or burnt contact tips, arc chutes, shunts, interlock fingers and worn mechanism base plates are replaced with new parts. All wire connections are gone over and tightened.

The reversers are tested, cleaned and oiled. All worn or burnt fingers or segment boards are replaced. All wire connections are tightened.

The line switches are tested, and all worn, burnt or broken tips, levers, arcing horns and arc chutes are



Road Failures Due to Grounded, Open and Short Circuited Train Line Jumper Wires

cleaned or replaced with new parts. Worn overload trip contacts and interlock fingers are replaced and adjusted. The operating magnet valves are overhauled and pin valve seats are ground on a six months basis.

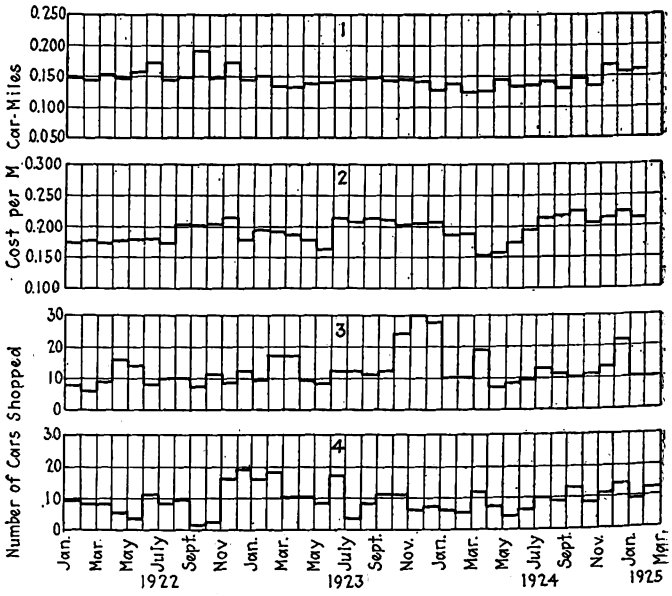
The rheostats are inspected for broken or fused grids and loose connections. At this time, broken or burnt insulators are replaced and the insulating collars are cleaned and shellacked.

The coupler sockets are inspected, particularly for loose or cracked insulation blocks and for loose or broken contact fingers and covers.

All switches and fuse base and connection boxes are inspected, particularly for loose parts, and all connections are tightened. All wires are examined for broken strands.

Before any car is allowed to leave the repair shop the electrical wiring on the car is given a high-tension test of 1,200 volts, for break-down of insulation, short and open circuits and grounds.

The truck trolleys and motor leads are inspected and removed on a time basis. The interval for the truck trolleys is every 18 months and that for the motor leads every 24 months. The flexible jumper connections between the cars, on which the reliability of the service depends to a large extent, are removed on a time basis of 18 months. The old jumper cable is scrapped and new cable is used so that the jumpers will be in 100 per cent condition.



A Few Typical Charts of Maintenance Records

No. 1. Lubrication cost per thousand car-miles — Manhattan division.
No. 2. Lubrication cost per thousand car-miles — Subway division.
No. 3. Cars shopped for pinions and gears—Subway division.
No. 4. Cars shopped for car body defects—Subway division.

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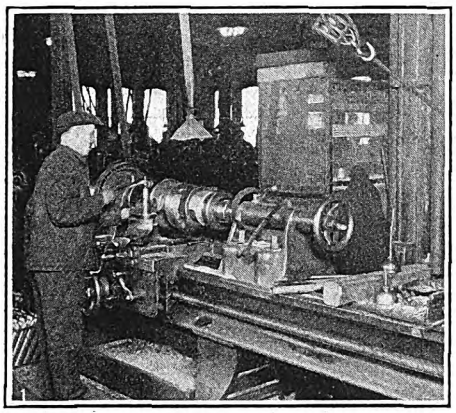
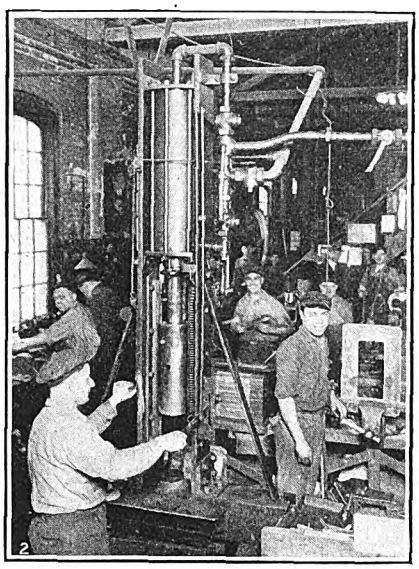
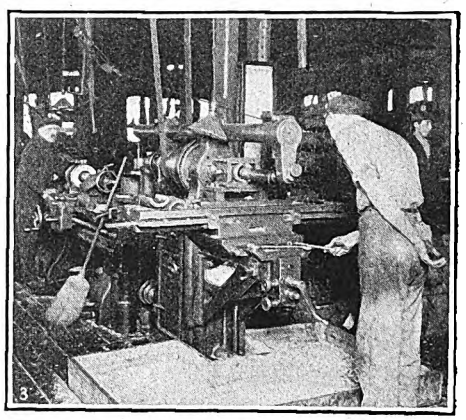
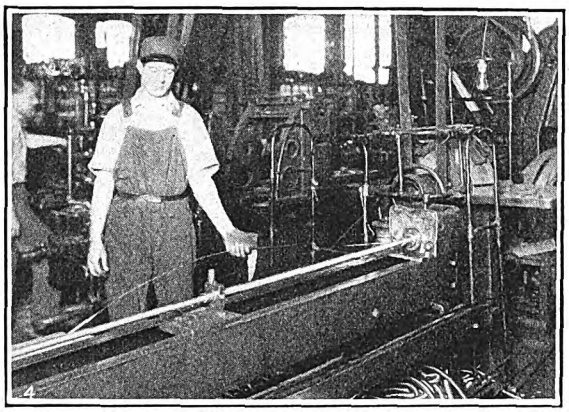
All wire used on the cars is made to the Interborough's specifications. These specifications are very rigid, calling for 30 per cent pure Para rubber. Wire is purchased by the company only from certain manufacturers who have been found able and willing to make wire that meets the company's specifications.

While the car bodies are going through the body repair shop, the trucks, brake rigging, air compressors, air brake equipment and trip devices are sent to a separate department where they are thoroughly inspected and the necessary repairs are made. All drawheads, pins and coupling links and also all pinions and gears are checked up for wear with a limit gage. Before a car is returned to service the air brakes, control and motor circuits are tested and the brakes are adjusted. At the same time, the car body is checked for height and side bearing clearance.









Four Interesting Machines in the Machine Shop at 98th Street and Third Avenue

Views 1 and 3 show the lathes used in turning axle brasses. The outside of a pair of journal brasses is being finished in View 1 and the inside in View 3. The two halves are held together by a band so they will make a perfect fit. The ring on the arbor of the boring tool in View 3 is a measuring gage. View 2 shows a pneumatic hammer for forming fiber disks for magnetic coils, washers, etc. This hammer was made from pick-up material in the shop. The fiber disks formed on this machine are first punched flat from strips. Then they are laid on a hot die and stamped to a dished form with this pneumatic hammer. This is a great saving in time over the old way of turning these disks on a lathe. A safety feature of this hammer is that the operator must use both hands on the machine while the hammer descends. The machine in View 4 is a device for winding brass wire into the form of spiral armor for motor and other leads. One great advantage of this machine is that it makes this wire armor of uniform size. It is also very rapid. The former method of making this armor was with a lathe with which 1,000 lb. of armor a week was a good record. This machine winds 1,000 lb. easily in a day.

Because of the high speed and the limited clearance of the cars with parts of the subway structure, good axles are even more of a necessity than on most electric railways. The company's specifications for axles are known among manufacturers to be very exacting. The original axles were annealed, but many years ago specifications were changed to call for higher-grade heat treatment such as is now used in the best automobile practice. Since the adoption of these specifications there has never been an axle failure under any of the Interborough cars. Although the use of this heat-treated material appears to be entirely safe, the company has always taken the extra precaution of having axles rigidly inspected at the mills before installation and subsequently tested periodically in service. The axles are tested at the shops on a 50,000-mile basis in the following manner:

The wheels and axles are removed from the trucks, and all rust and scale are removed from the axle. The axle is then immersed in a lye tank for 35 minutes. It is then thoroughly wiped clean with waste, after which it is put in a hot bath of oil at a temperature of 240 deg. F. for 35 minutes and again wiped clean and dry. The axle is then coated with whiting and alcohol. It is then vibrated and carefully examined with a magnifying glass for evidence of detail fractures. Views of these tests are given on page 442.

The same test of being cleaned and oiled, then coated with whiting and vibrated, is applied to the wheels and also to the swing hangers, equalizer bars, king pins, car-body brake rods, pinions and axle cap bolts on all trucks when they are passing through the repair shop.

All pinions are heat treated. In the vibration test given to them every tooth is vibrated and examined for defects. Axle cap bolt lock washers are of the type known as parallel washer, made of high-powered steel. They are scrapped every time bolts are removed.

Motor Maintenance

The company has a large variety of motors, as shown in Table IV. The controller equipments are also listed in Table IV.

As motors go through the shop all field coils and armatures are inspected and tested for defects. Those found in bad order are tagged with a "bad order" card. This card, which is 5½ x 7 in., carries an illustration of a field coil or armature, on which the position of the defect may be marked. The back of the card contains space for further remarks, as well as a duplicate illustration of the field coil or armature. Bad order tag cards for field coils are printed on white stock, those for interpole fields on blue stock and those for armatures on buff stock.

While the cars are in the shops all armatures are gaged and tested for lateral motion. The brush-holders are removed and the brush-holder insulators are cleaned.

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TABLE II—CAR MILES OPERATED BY INTERBOROUGH RAPID TRANSIT COMPANY

1924	Manhattan Division	Subway Division
January	5,846,507.86	10,612,235.92
February	5,640,206.58	9,904,537.68
March	5,900,367.18	10,647,975.80
April	5,733,409.04	10,363,926.38
May	5,858,668.02	10,586,635.78
June	5,647,319.86	10,252,600.48
July	5,840,973.64	10,646,098.08
August	5,811,159.04	10,687,431.32
September	5,609,906.34	10,359,475.78
October	5,925,431.38	10,855,921.44
November	5,437,824.74	10,236,859.74
December	5,781,432.86	11,279,051.20
1925:		
January	6,065,499.22	11,572,098.04
February	5,173,410.02	10,304,671.20

TABLE III—CARS OWNED BY INTERBOROUGH RAPID TRANSIT COMPANY

	Manhattan Division	Subway Division
Motor cars	1,483	1,464
Trailer cars	715	669
Total	2,198	2,133

TABLE IV—MOTORS AND CONTROL EQUIPMENT OWNED BY INTERBOROUGH RAPID TRANSIT COMPANY

MOTORS OWNED

Manhattan Division

GE-66	1,673
GE-211	178
GE-220	6
GE-259	296
WH-302	240
WH-333-L -3	594
Total	2,987

Subway Division

GE-69	418
GE-212	460
GE-211	4
GE-240-C	12
GE-259	152
GE-260	878
WH-86	540
WH-300	198
WH-302-F-2	12
WH-577	338
WH-33-L-3	46
Total	3,058

CONTROL EQUIPMENTS

Manhattan Division

Type M-GE	937
Westinghouse Air	79
Low voltage—GE	200
Low voltage—WH	276
Non-Revenue	
Type M-GE	8

Subway Division

High voltage:	
Bridge-GE	327
K-GE	333
Low voltage:	
PC-2-GE	6
214-WH	6
PC-8-GE	124
214-A-WH	402
PC-10-GE	266
Total	1,464

At the same time the brush-holder tension is tested with a spring balance. The commutator and the armature as a whole is also inspected and given an electrical test.

Turning Rolled Steel Wheels

The rolled-steel wheel is used exclusively on subway division motor trucks. Previous to its development, less than 20 years ago, steel tires were used, but owing to the high rates of braking they were not satisfactory. The heat from the action of the brakes used would tend to loosen the tire and special means had to be adopted to correct this trouble. The development of the rolled-steel wheel was therefore very acceptable to the operators of the rapid transit lines in New York. The

Samples of Piecework Prices Used in Painting Manhattan Division Standard Cars

NOTE: Contracts include refinishing all work found unsatisfactory by foreman or inspector; preparation work; stacking and racking work; delivery of material to and from car and bench, etc.

Body Exterior—Motor or trail car, burn off enamel with burning machine, sand and putty, letterboards, side and end window posts, window stops, post battens, pier panels, window stools, aprons, sheathings, panels, battens, end body doors, end door posts and headers, door post battens, body corner posts and battens, bulkhead panels, hood bows, hood sheathing, and end stationary sash. Operations:

Burning, per car $11.66
Sanding, per car $2.54

Body Exterior—Motor or trail car. Enamel (orange color). Side and end window posts, window stops, post battens, pier panels, window stools, aprons, sheathings, panels, battens, end body doors, end door posts and battens, body corner posts and battens, end stationary sash. Operations:

Enameling, first coat, per car.... $1.55
Enameling, second coat, per car.. $2.07

Body Exterior—Motor or trail car. Enamel (black color). Letterboards, lower deck crown moldings, end door headers, bulkhead panels, hood bows, hood sheathing and battens. Operations:

Enameling, first coat, per car.... $0.86
Enameling, second coat, per car.. $0.95

Clear Story—Exterior motor or trail car. Enamel (black color). Upper deck sill and plate posts, panels, moldings and sash stops, carlin ends, roof sheathing at eaves, and hood sweep panels. Operations:

Enameling, first coat, per car.... $0.68

Body Exterior—Motor or trail car. Re-enameled type. Sand and putty, letterboards, side and end window posts, window stops, post battens, pier panels, window stools, aprons, sheathing, panels, battens, end body doors, end door posts, and headers, post battens, bulkhead panels, hood bows, hood sheathing, end stationary sash, upper body side and end sash. Operations:

Sanding, complete, per car..... $1.40
Puttying, complete, per car..... $0.33

Body Exterior—Motor or trail car. Re-enameled type. Enamel (orange color). Side and end window posts, window stops, post battens, pier panels, window stools, aprons, sheathing, panels, battens, end body doors, end door posts and battens, end stationary sash, upper body side and end sash. Operations:

Enameling. Apply first coat, per car $1.85
Enameling. Apply second coat, per car $2.20

Lettering, etc.—Motor or trail car. Exterior. Letter side panels or side sheathing in dark blue color, letterboards orange color, number side of car dark blue color, end door header and bulkhead panels in imitation gold, stencil cross-seat front rail in imitation gold; includes: layout, stripe and cut in. Operations:

Lettering. Paint words "Interborough" on letterboards, per car $1.10
Lettering. Paint words "Open Air Line" on side of car, per car.. $1.83
Numbering. Paint four figure car, 16 numbers on side of car, per car $0.84

Body Equipment—Exterior motor car. Clean and paint rheostat frames and hangers, contact boxes, fuse boxes, junction boxes, compressor and cradle, brake cylinder, air reservoirs, pipes, cleats, rods, clamps, asbestos, linings, truss rods, posts, needle beams and needle-beam truss rods, end caps and nuts. Operations:

Cleaning, per car $2.352
Painting, per car $2.898

Interior, Skinned Off Motor Car below advertisement signs. Remove varnish with remover and revarnish advertisement sign and window moldings, window cappings, pier panels, wainscotings, wire moldings at cross-seats, blind stops, cross and side seat framing and risers, end bulkhead partitions, end stationary sash, swing sash, switch boxes, cab partitions both sides, end doors, cab doors both sides, all wood trim not removed from car. Operations:

Removing varnish, bleach and sand, per car $15.00
Varnishing. Fill, shellac, putty and varnish first coat, per car $4.26
Varnishing. Sandpaper and varnish, second coat, per car..... $1.396

Interior, Complete — Revarnished motor car. Upper deck posts, casings and sash stops, panels, deck sill and plate facia and moldings, upper and lower deck headlining, edge moldings, strap poles, advertisement sign and window moldings, window cappings, upper body side and end sash, pier panels, wainscotings, wire molding between cross-seat, cross and side seat framing, and risers, end bulkhead partitions and bulkhead panels, end stationary sash, swing sash, switch boxes, cab partitions and bulkhead panels, end stationary sash, swing sash, switch boxes, cab partitions and head panels, both sides, blind stops, partings and casings, end doors, cab door both sides, and all wood trim not removed from car. Operations:

Shellacking. Sand, bleach, stain and shellac in part, per car.... $1.134
Varnish. Sand and varnish, per car $2.814

Stripping—Manhattan motor car, curtain or blind type. Strip complete as follows: Remove signal bells, bell and emergency cords, window guards and grab handles, end door locks complete with keepers, swing sash catches and keepers, cab, door locks, stile reinforcement plates, upper and lower sash, partings and frame casings, cab pocket, upper and lower drop sash, casings, partings, lifts, lock and lock stops, motorman arm rests; sash, body side upper and lower, partings, casings, lifts, locks and lock stops; blinds, partings and lifts; destination sign boxes and brackets, notice signs, fire extinguishers, emergency pipe cleats, side and cross-seat backs; stencil sash, partings and castings; place all hardware in boxes and bundle up wood trim. Strip complete including upper sash:

Motor car, 24 window curtain, per car $2.35

Trimming—Manhattan Motor Car curtain or blind type, when not equipped with Dahlstrom posts. Trim as follows: Apply window guards, signal bells, bell cord, anchors, hooks and eyebolts, emergency cords, anchors, hooks and eyebolts, end doors, casings, locks, lock keepers, chafing plates, anti-rattlers, rubber bumpers, cab doors, locks, lock keepers, seat rests, and lock stile brace plates, cab upper and lower sashes, lifts, locks, lock stops, casings and partings, cab seats, swing sash catches and keepers, upper and lower body sashes, blinds, curtains, sash and blind lifts, partings and casings, sash locks and stops, notice signs, cross and side seat backs, fire extinguisher box complete, destination sign box and sign blade brackets, includes: fit and drill all holes, replace all broken or missing parts found on inspection. Trim complete:

Motor curtain type, 24 window, per car $9.50

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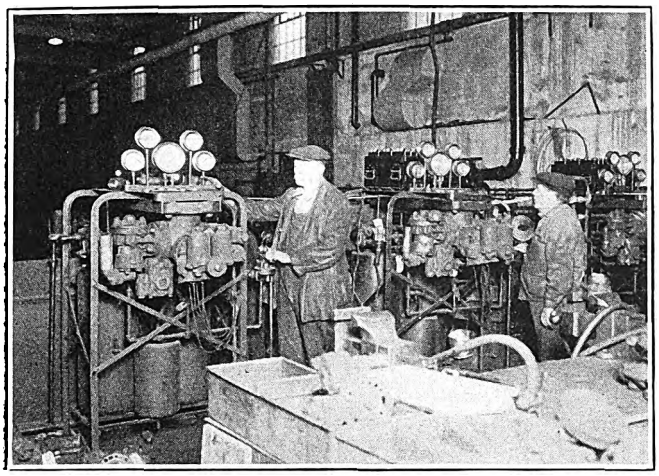
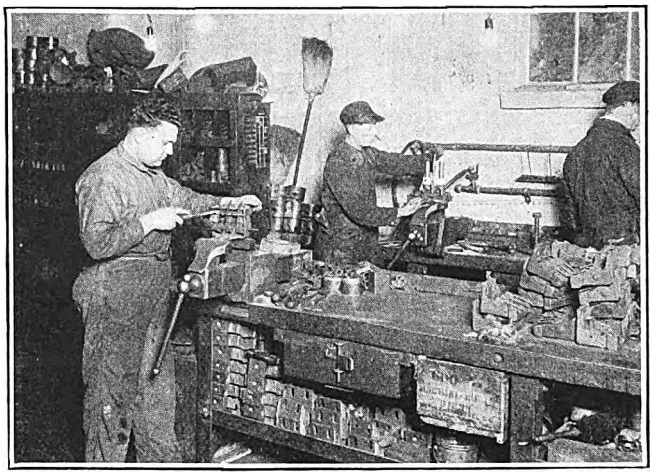




Air Brake and Brush-Holder Repairs Are Facilitated by Special Equipment
The left-hand view shows the testing department for motorman's operating air valves. The valves are tested as in regular service. At the right, a portion of the brush-holder repair department is shown

Interborough company was the first to co-operate with the manufacturers in the introduction of the rolled-steel type of wheel for heavy traction work. Since its introduction the company has carefully followed up all later developments and performances of this type of wheel in heavy traction service.

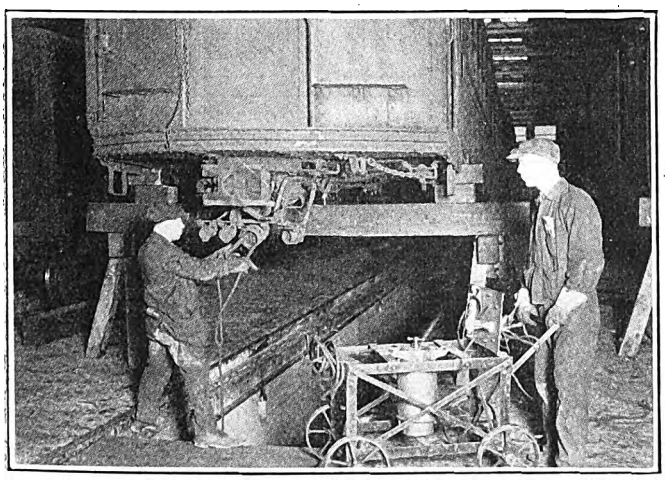
The method of turning wheels at the 147th Street shop was described in an article on page 443 of the issue of this paper for March 17, 1923, with some particulars of the piece-work system employed for practically all the repair and maintenance work of the company. The advantages of this system as a means of saving investment are perhaps no more prominently exhibited than in the work of turning wheels. Under the piece-work system the men have a strong incentive for speeding up, and the output of the lathes is correspondingly increased. The result of this is that at the 147th Street shop only three wheel lathes are required, each wheel lathe operated by one man turning out an average of 15 pairs of turned wheels per day.

Two of the charts reproduced on page 444 show the method of tabulating the number of cars shopped for wheels on the subway division and the number of flat wheels per month developed on the motor trucks and trailer trucks of the Manhattan division.

In one respect the repair situation of the company is complicated in that it has to care for the maintenance and repair of two entirely different kinds of cars, namely, wooden cars, as used on the Manhattan elevated division, and all-steel cars as used on the subway division. It is therefore in a position to be well acquainted with methods of maintenance and repair for both kinds of rolling stock and can offer to others the valuable experience it has gained in doing this work side by side with two distinct classes of equipment. While the same methods are followed in maintaining both the steel and wooden car bodies, the body repairs of each type require entirely different types of shop machinery. The steel cars are repaired at 147th Street and Lenox Avenue subway shop, which is equipped with the necessary iron-working machinery for making all classes of steel body repairs. All wooden cars are repaired at the 98th Street and Third Avenue shops, which have a full equipment of wood-working machinery.

Lubrication Practice

Owing to the exacting character of the service, special attention is given on both divisions of the Interborough Rapid Transit Company to proper and adequate lubrication. The methods employed represent an extended experience of the engineers of both the Inter-



Electrical Tests for Car Wiring and Armatures Detect Open Circuits, Short Circuits and Grounds
High-tension tests on car wiring are made at 3,000 volts a.c. The convenient portable transformer outfit shown in the view at the left is used. It can be operated from a 110-volt a.c. socket. The view at the right shows the method of telephone testing armature and commutator connections to show short circuits and grounds.

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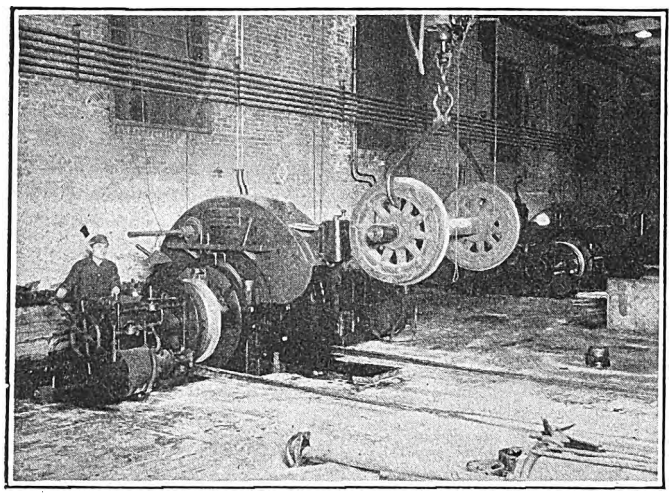

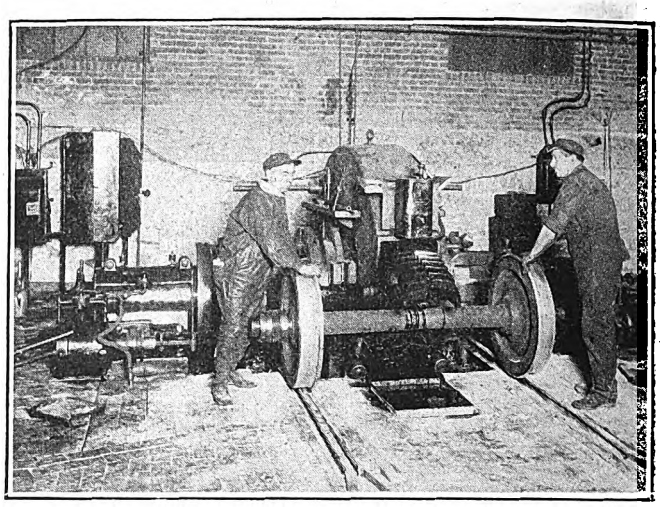

Equipment for Wheel Turning at the 147th Street Shops
These powerful lathes for turning steel wheels have been of enormous help in keeping the cars used in New York rapid transit service supplied with wheels

borough Rapid Transit Company and the Galena Signal Oil Company, which has a yearly contract with the railway company for the lubrication of car equipment at a guaranteed cost per 1,000 car-miles. A typical report showing the method of tabulating the amount and cost of lubrication is that reproduced in the accompanying table, which shows the lubricant chargeable to cost per 1,000 miles during March, 1924, for the subway division.

As will be seen, the averages for the different divisions vary considerably. This variation is due largely to differences in the type of equipment used. It will also be noticed that all costs are reduced to a basis of 1,000 car-miles.

Oiling of all moving parts is done at each car inspection, which is at intervals of 1,000 miles for motor cars and 1,200 miles for trail cars, but at the end of every tenth inspection the cars receive what is known as a general oiling. At this time, the waste is removed from the motor axles and journal boxes, which are then repacked. For this packing long-strand carpet wool waste is used.

Gears are lubricated with 4 lb. of gear grease every 10,000 miles, but for every 1,000 miles the pinion ends of the armature bearing are given 2 gills of oil and the commutator end bearing 1½ gills. All armature bearings are drained every time a motor car is brought into a shop. The oil is then carefully strained through several layers of cheese cloth and is then used again for lubricating journal bearings, while the refuse is retained for greasing drawbars, brake riggings, side bearings, sector bars, etc.

As already explained a great deal of attention is given to lubrication because of the hard service which the equipment has to perform and the knowledge that adequate lubrication is one of the greatest means of reducing maintenance.

To insure proper lubrication on the road, a representative of the Galena company pays a visit at least once a month to all depots and shops, taking up with the carhouse foremen their last lubrication report and inspecting the oil housings, tanks and filters with which the various shops and carhouses are provided.

To stimulate interest in better lubrication copies of

TYPICAL MONTHLY REPORT FOR JANUARY, 1925, OF LUBRICANTS CHARGEABLE TO COST PER THOUSAND MILES, INTERBOROUGH RAPID TRANSIT COMPANY, SUBWAY DIVISION

Divisions	Motor Car Mileage	Trail Car Mileage	Total Car Mileage	Car Oil Used in Motors	Car Oil Used in Journals	Car Oil Used in Trailer Journals	Gear Grease	Comp. Oil	Total Oil, Gallons	Cost per 1,000 Miles, Motor Cars	Cost per 1,000 Miles, Trail Cars	Total Cost per 1,000 Miles	Total Cost per 1,000 Miles Previous Month	Value of Lubricants Consumed
240th St.....	2,335,394.86	1,060,948.63	3,396,343.49	Barn, 1,117	139	126	132	571	1,953	$0.19717	$0.02613	$0.14374	$0.16390	$488.15
				Shop, 563½	418	85	816	38	1,104½	.11637	.01763	.08552	.11454	290.47
				1,680½	557	211	948	609	3,057½	$0.31354	$0.04376	$0.22926	$0.27844	$778.65
148th-180th St.	3,089,234.33	1,798,421.33	4,887,655.66	1,446	111	104	242	544	2,205	.16970	.01272	.11194	.11273	547.13
				738	548	151½	1,070	50	1,487½	.11530	.01853	.07970	.07697	389.53
				2,184	659	255½	1,312	594	3,692½	$0.28500	$0.03125	$0.19164	$0.18970	$936.66
Jer.-Lex.....	1,192,282.85	542,288.02	1,734,570.87	312½	30	40	11	178½	561	.11011	.01623	.08076	.08465	140.08
				301	224	46	436	20	591	.12182	.01866	.08957	.06867	155.36
				613½	284	86	447	198½	1,152	$0.23193	$0.03489	$0.17033	$0.15332	$295.44
Whitlock.....	807,855.88	374,038.80	1,181,894.68	505½	42	53	75	139½	740	.20765	.03117	.15180	.16567	179.41
				291½	216	18	422	19½	545	.17390	.01059	.12222	.13518	144.45
				797	258	71	497	159	1,285	$0.38155	$0.04176	$0.27402	$0.30085	$323.86
Queens.....	371,633.34	.....	371,633.34	72	7	7	10	95	181	.12746	.....	.13161	.12249	48.91
				49	36	...	71	3	88	.06313	.....	.06313	.08687	23.46
				121	43	7	81	98	269	$0.19059	.....	$0.19474	$0.20936	$72.37
Totals.....	7,796,401.26	3,775,696.78	11,572,098.04											

MILEAGE PER GALLON AND POUND

	Car Oil				
	Motors	Trailers	Averages	Comp. Oil	Gear Grease
240th St.....	1,044	5,028	1,387	3,835	2,463
148th-180th St...	1,087	7,039	1,577	5,201	2,355
Jer.-Lex.....	1,374	6,306	1,819	6,006	2,667
Whitlock.....	766	5,268	1,050	5,081	1,625
Queens.....	2,266	.....	3,173	2,792	4,588
Division Averages	1,088	5,993	1,484	4.701	2,373

Average cost for entire system.....$0.20800

Last months average cost for entire system.... 0.22268

ALBERT L. WESTCOTT
Service Engineer Galena Signal Oil Company

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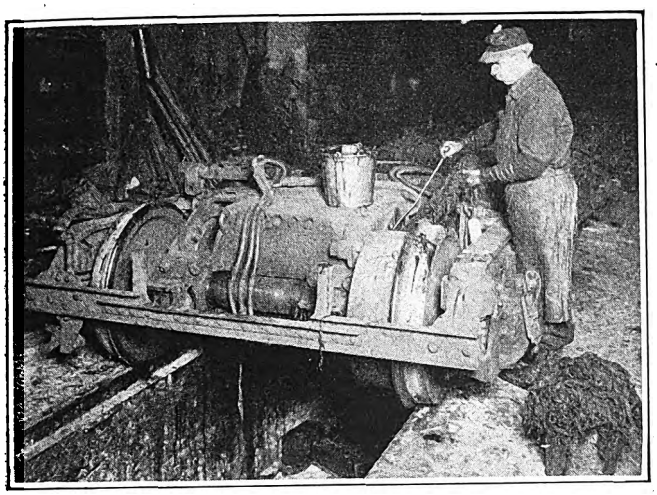
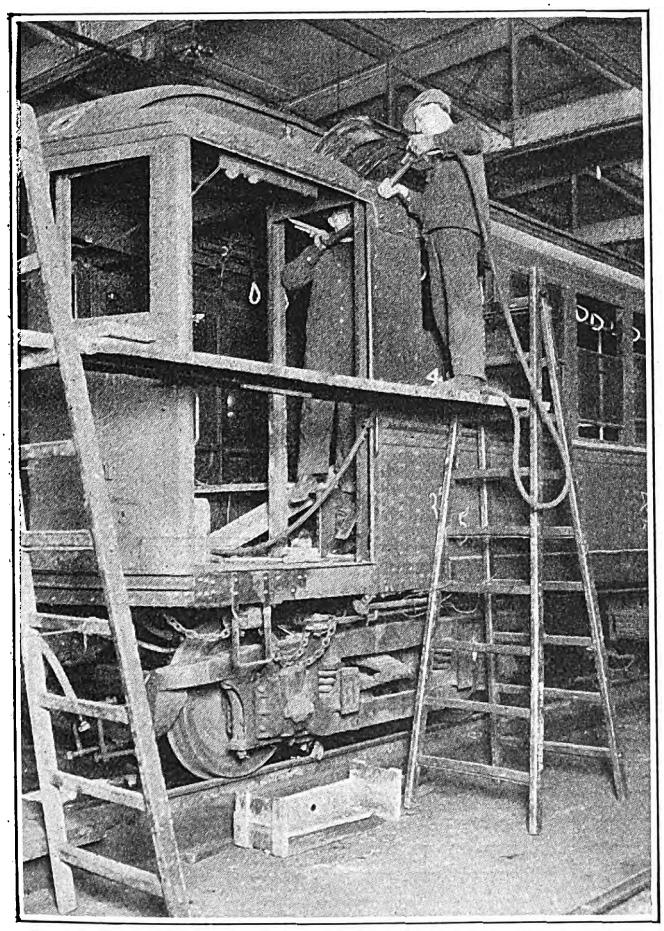


Packing Armature Bearings with New Oil-Saturated Wool Waste

the monthly reports of the lubrication expert to the superintendent of car equipment are sent to every division superintendent. At this time the superintendent of car equipment calls the attention of the division superintendents to any special points in the lubrication report which seem to call for consideration. Thus a record of an excessive amount of oil used is a reason for asking for an explanation of the conditions which brought about such a condition.

All general painting of cars is done at the 98th Street shop. Records are kept in the main office showing the date on which each car was last in the paint shop, the time when it should return to the shop if not called in earlier and the kind of painting called for.



Riveting a Roof Plate on a Car by a Pneumatic Riveter

The cars on the subway and elevated divisions are treated from a painting standpoint in an entirely different manner. The elevated cars, being very conspicuous from the street, are painted an orange color with black striping and considerable lettering. The use of so light a color is not considered necessary in the subway, so the cars on the subway division are painted a Pullman green with no lettering except the word "Interborough" on the letterboard, and the number of the car on each side at each end.

An important feature in the paint shop is the use of the piece-work system, which was adopted in 1905. Portions of the piece-work schedule for Manhattan cars are published on page 446. Other figures with typical blanks used in the shops of the company were published in the issue of this paper for March 17, 1923.

Performance Records Feature Tire Maintenance Practice

Los Angeles Motor Bus Company Is Making a Careful Study of Tire Mileage—High-Crowned Pavements Produce Uneven Wear

MAINTENANCE work on the buses of the Los Angeles Motor Bus Company, which is a subsidiary of the Los Angeles Railway and the Pacific Electric Railway, is done in a modern garage built of steel, brick and concrete. The offices of the company are on the second floor, while on the ground floor the buses are stored and repaired. In addition to storage space for 50 buses around the walls there are numerous inspection pits equipped with cranes for handling these heavy vehicles. Painting and the heaviest form of repair work are done at the railway shops.

No bus operates more than 200 miles per day. Schedule speed varies between 12 m.p.h. in the middle of the day and 7 m.p.h. in the rush hours. When a bus comes from the road it is gassed, oiled, and inspected. All lights are turned on to discover burned-out globes. Batteries and the airbrakes with which all are equipped are tested. Air in the tires is renewed every three days. Buses are greased every 500 miles and the oil changed every 1,000 miles, at which time they are taken into the pit for general inspection. After a mileage of 40,000 to 60,000 there is a general overhauling. This is practically on a yearly basis.

A record is kept of each individual tire. On every tire is burned a company number and a distinguishing letter. Thus a Moreland tire will never be used except on a Moreland bus, a Fageol except on a Fageol bus, etc. A tire numbered in the 4,000s is a 34-in. tire; one in the 5,000s a 35-in., etc.

When a tire is to be changed the mechanic fills out in duplicate a "Tire Change Blank," containing complete data. One copy he keeps; the other he sends to the storekeeper each day. Each wheel of a bus is numbered and the number of the wheel and the number of the tire must be put down on the record.

All of the data relative to tires are consolidated on permanent records which are instantly available. Any tire which has to be changed or repaired is first listed on a small file card called a "Tire Location Card." These data are then transferred to a larger filing card, which is the "Tire Record." As the mileage reading of the speedometer is taken and entered on the "Tire

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Storage Space for 50 Vehicles Is Provided in the Garage of the Los Angeles Motor Bus Company as Well as Facilities for Maintenance

Record" card at each change and also the number of the wheel from which the tire was taken, the amount and kind of service given can be exactly determined.

There is a special reason for recording the number of the wheel from which a damaged or wornout tire has been removed. Because of high-crowned pavements, tires used on the Los Angeles buses wear unevenly. The inside right rear tire on a bus with double rear wheels receives the hardest wear. It is estimated that these wear only 60 per cent as long as the others do. This cannot be figured closely, however, because tires are constantly being changed around to equalize the wear.

It was found after considerable experimentation that the buses rode best and tires lasted longest when unequal air pressure was used to equalize the slant of the crowned streets. With 34x7 tires the outside right and inside left tires carry ordinarily 100 lb. of pressure. The inside right and the outside left carry 90 lb.

The buses, especially the double-deckers, are hard on tires. The double-deckers tend to roll from side to side after passing over an inequality in the paving. This motion rolls the edge of the flap nad cuts the tube. A special set of tires has been made up and is now being tested by the compan. They are 12-ply instead of 10-ply and the management hopes they will solve this phase of the tire problem.

As each bus finishes its day's run and comes into the garage it is dusted and swept and minor repairs are made. The buses are washed at stated intervals. Records of these details are also kept. Not more than 15 minutes a day is required for keeping these and the tire records up to the minute. If a bus gets in trouble on the road the crew reports in and a mechanic or a tow car, depending on the degree of seriousness, is sent out. There is a "Road Trouble Sheet" for reports on breakdowns and their causes, including accidents. A 24-hour "Divisional Accident Summary" is made out for the manager's office by the dispatcher. Every accident, no matter how trivial, is personally investigated by the assistant manager in charge of operations.

All parts required for repairs are drawn on requisition. For this purpose the company uses an Acme Perpetual Inventory Card System. Every six months there is a check of stock to adjust errors.

RECORD Mfs. No.

MAKE TYPE STYLE PURCH. COST

DATE	REPAIRED BY	JOB NO.	NATURE OF REPAIRS	COST

L. A. Motor Bus Co. TIRE LOCATION CARD

RIGHT FRONT 1	LEFT FRONT 2	RIGHT REAR INSIDE 3	RIGHT REAR OUTSIDE 5	LEFT REAR INSIDE 4	LEFT REAR OUTSIDE 6	REMARKS

LOS ANGELES MOTOR BUS CO.

Mfr's No. LOS ANGELES MOTOR BUS COMPANY TIRE RECORD

MAKE	SIZE	DATE RECEIVED	DATE OF CONTRACT	DATE OF INVOICE	DATE RETREADED	DATE SCRAPPED

BUS NO.	DATE ON	SPEEDOMETER READING	WHEEL NUMBER	DATE OFF	SPEEDOMETER READING	MILEAGE	WHY REMOVED

Form 13 M—5M—6-24.

LOS ANGELES MOTOR BUS CO.

Bus No. TIRE CHANGE BLANK

SPEEDOMETER READING

TIRE OFF	TIRE ON
Wheel No.	Wheel No.
Tire No.	Tire No.
Reason	Taken from
Repairs	Service Car No.
Blow Out	Stock Room
Puncture	Repair Rack
Adjustment	Changed By
Date	
REMARKS	

Forms Used teo Keep Accurate Record of Tire Performance

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Maintenance of Armature Bearing and Housing Fits

For Efficient Operation and Long Life Sleeve Bearings Should Line Up Accurately with Armature Shafts—Bearings Loose in Housings or Housings Which Are Loose in Motor Frames Cause Misalignment, Rapid Wear and Large Oil Consumption

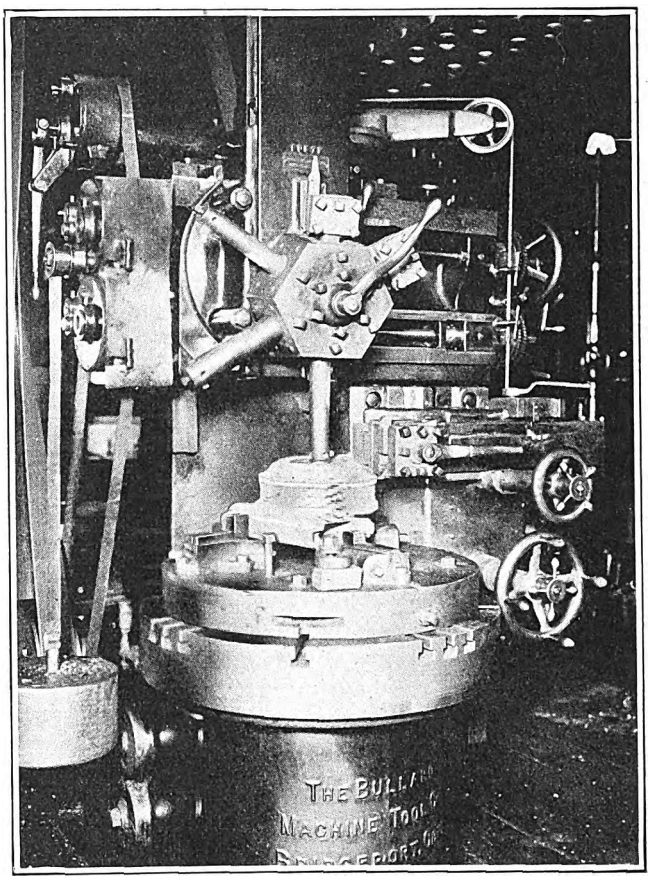
By E. F. Whitney
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

THE life obtained from armature bearings depends not only upon the lubrication and the elimination of dirt and water from the bearings but upon the alignment of the bearings, the running clearance for the shaft and the assembly of the bearings in the housing. Housings that are worn and are loose in the frame are liable to cause incorrect alignment of the armature bearings. This trouble can best be eliminated by renewing the housing or by welding and remachining the housing fit. Shimming should not be permitted. At best, it is but a temporary repair and is sure to cause trouble. Bearings which are shimmed to keep them tight in the housing will usually be out of alignment, and unless the shaft journal clearance is increased several thousandths of an inch it is quite probable that the armature shaft will bind in the bearings.

Particular attention should be given to fitting the bearings to the shaft after they have been pressed into the housings. Armature bearings which are easily driven into place will loosen in service and start excessive wear of the housing bore and bearing. Loose bearings and excess journal clearance all tend to increase the oil consumption and permit destructive vibration of the motor parts.

Motors of the older types usually require armature bearings bored undersize for use with worn shafts. In some instances bearings with the outer diameter oversize are necessary if the bearings are to fit tightly in the housings. Armature shaft journals will wear tapered and it is desirable to turn these journals down for use with the undersized bearings. If the wear at any section of the journal reduces the diameter as much as $\frac{3}{64}$ in. it is desirable to turn the shaft down and polish the journal so as to bring it to the nearest undersize for which bearings are available. Some operators have found it preferable to standardize the undersized shaft journals in steps of $\frac{3}{32}$ in. diameter. On many other properties standardization includes only such dimensions as $\frac{1}{16}$ in. and $\frac{1}{8}$ in. undersize, as this reduces the number of renewal bearings to be carried in stock.

Many of the older types of motors were originally equipped with cast-iron or malleable-iron babbitted bearings. The babbitt lining in these bearings is so thick that the armature can drop down on the pole pieces in case a hot bearing occurs and the babbitt melts out. This usually results in the loss of an armature with considerable damage to the laminations. Babbitted bronze bearings for the newer type motors, as well as for the older types, are made with a thin babbitt lining. Then if a hot bearing develops the journal will be seated temporarily in the bronze shell, which will prevent the armature from striking the pole pieces. This feature of bronze babbitted bearings enables a crippled motor to operate in an emergency and makes possible the return of the car to the shop without excessive damage. Bronze shells can be tinned and rebabbitted more easily and satisfactorily than malleable iron or cast iron. This gives a certain assurance that longer bearing life will be obtained.



Armature Bearing Housing in Position for Boring in a Vertical Turret Lathe

The bore of the housing, or of the bearing seat in some of the older motors which do not use housings, may be worn so much as to require a bearing with a larger outside diameter than the standard bearing. If the housing bore can be welded satisfactorily so as to avoid distortion or imperfect alignment it may be remachined to standard size. Housings which are worn only three or four thousandths in the bore can be fitted with slightly oversize bearings. If the wear amounts to several thousandths, the housing should be rebored

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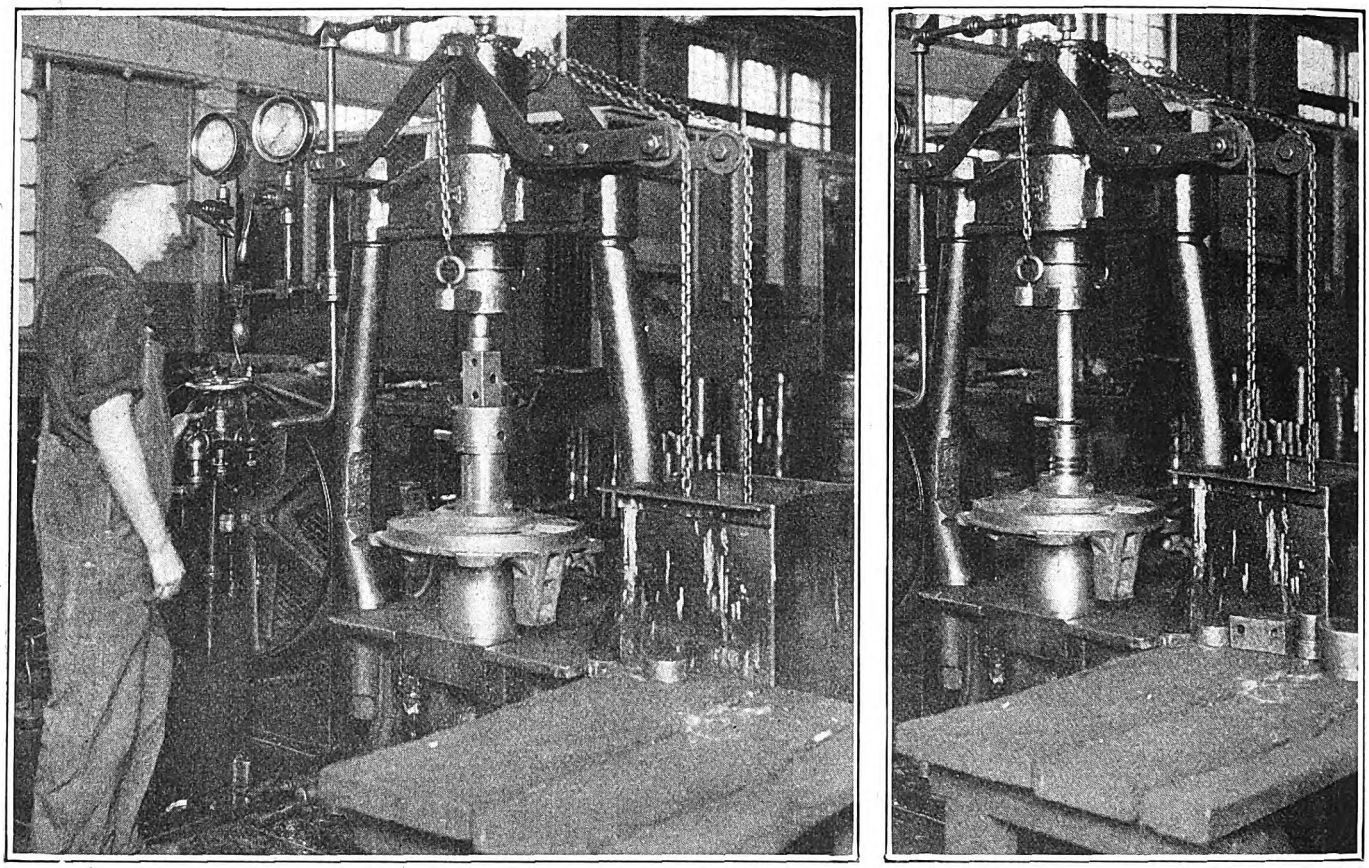

At Left—Pressing Bearing into Housing with Bearing Press. At Right—The Same Press Is Used for Broaching the Bearing Surface

for an oversize bearing, built up by welding and remachined to standard size or a new housing should be obtained. Housings of light construction, unless they are of steel, should not be weakened by reboring more than $\frac{1}{16}$ in. diameter oversize. Heavy housings with thick hub sections can safely be rebored $\frac{1}{8}$ in. larger in diameter.

The reboring of the housing can be done best in a vertical turret lathe such as shown in an accompanying illustration. The housing must be centered from its outside rim and the axis of the boring bar must line up with the center line of the housing bore. The set-up for box frame motor housings can best be made by attaching a false jaw of soft steel to each of the four chuck jaws. These jaws are then bored and faced off on top to form supports for the rim of the housing similar to the housing seat of the motor frame. With the housing clamped in the lathe a light cut should be taken in the bore. Then it should be finished to exact size. Special attention should be given to make the bore smooth and within a variation of plus or minus 0.001 in., so that a lasting press fit of the housing may be obtained. The original keyway, if worn, should be welded before reboring and recut for the standard key after the housing has been rebored.

The outside diameter of the armature bearing should have a press fit allowance of plus 0.002 to 0.004 in. Its surface should be smooth and free of any ridges or tool marks. Large bearings may be given a coating of white lead on the outside, but with the smaller ones ordinary machine oil could be used when pressing the bearing into the housing.

A type of bearing press such as shown in one of the illustrations will give satisfactory results. The hydraulic type, operating with a plunger speed of 8 to 10 in. per minute, is more desirable than a faster hydraulic type of press or the air cylinder type. The bearing should be started into the housing by driving it with a flat plate, after which 3 to 5 tons pressure should be applied. With large bearings about 5 to 8 tons pressure will be required at the final instant.

Babbitted armature bearings after they have been pressed into the housing will be closed in so as slightly to reduce the bore. It is therefore necessary to broach the bearing to make it the desired size. A broach of the type shown is very satisfactory. The broach should have from six to nine annular teeth, ground to different diameters, varying by increments of 0.002 in. The maximum size of the broach should be from eight to fourteen thousandths larger than the shaft diameter, depending upon the journal size. One very desirable feature of broached bearings is the polished surface of the babbitt which the broach leaves as it cuts its way through the babbitted bore.

The table below shows the maximum and minimum running clearance for the journal for shafts of various sizes:

ALLOWABLE RUNNING CLEARANCE FOR JOURNAL BEARINGS, IN INCHES

Shaft Diameter	Clearance for Journal	
	Maximum	Minimum
2 to 3	0.008	0.006
3 to 4	0.010	0.007
4 to 5	0.014	0.008

With larger motors it is desirable to keep closer clearances and exact alignment. The armature bearings of such motors, after being pressed into the housings, should be finish-bored instead of being broached to size. If broaches are not available for the smaller bearings, then these bearings should be rebored after they are assembled in the housing, in order to obtain the required clearance. The set-up for this operation would

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be the same as that made if the housings were to be rebored in the vertical turret lathe.

The sides of the waste window of the bearing should be rounded or beveled and oil grooves should be cut from the corners of the window to permit the lubrication of the flange end by the oil collected in the chamfer at the side of the waste window. The groove should be cut through to the face of the flange to lubricate the wiper face and the bearing flange.

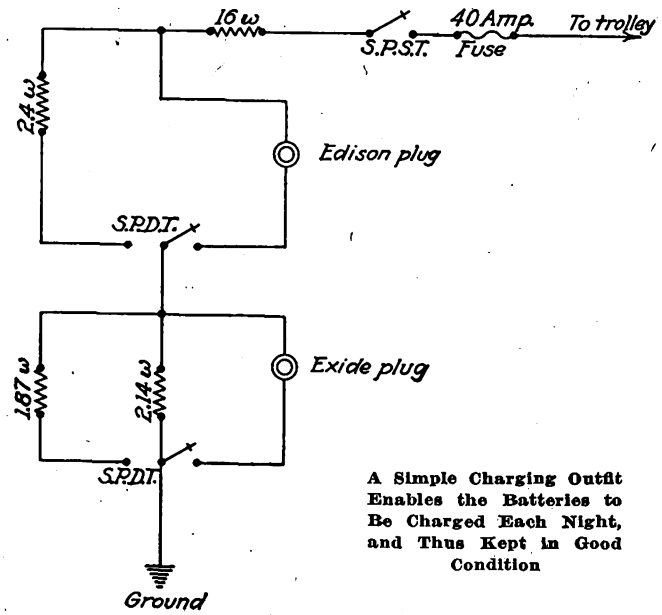
It is necessary in following out this bearing renewal procedure to have both the pinion end and commutator end housings accompany the armature to the winding room and bearing department where the shaft journals would be calipered and, if worn, turned to a standard undersize. The bearings would then be pressed into the housings and the bores either broached or machined in the vertical turret lathe to give a uniform bore concentric with the housing seat. The armature with its housings would then be returned to the assembly floor, where the complete motor would be assembled and tested before being put into service.

Storage Battery Trucks Save Time and Labor

Kansas City Railways Uses Two of These Trucks and Finds Them Valuable for Handling a Large Variety of Railway Parts and Materials

TWO storage battery trucks which have been used in the shops of the Kansas City Railways for some time have paid valuable returns in the form of savings in labor and time for handling the miscellaneous varieties of materials that must be moved about the shop. This equipment is used for handling such materials between the various shop departments, between the shop and the storeroom, and also for loading the supply cars that transport materials and parts to the various carhouses.

One of the trucks is of the fixed-platform type and the other has an elevating platform. The former is the older of the two. Since this has a larger platform than the other, it has been equipped with special racks for carrying such car parts as mounted wheels, motor cases, etc. Tiers of boxes containing finished parts going from the shop to the storeroom are readily handled on the elevating platform truck. This type is also found particularly handy for handling large boxes or containers filled with parts.



A Simple Charging Outfit Enables the Batteries to Be Charged Each Night, and Thus Kept in Good Condition

Charging equipment has been set up as shown in the accompanying diagram. This consists of a rheostat for regulating the rate of charge and instruments for measuring the current and voltage. It is the practice to test the batteries each evening. They are then plugged into the charging line, and the night watchman has instructions to take them off some time during the night, or whenever they are completely charged.

The trucks are manned by an operator and helper. These men replace a number of laborers who were formerly required for moving materials about the shop on hand trucks.

These Storage-Battery Trucks in the Shops of the Kansas City Railways Are Found Very Valuable for Moving Materials About the Shops

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Standard Forms for Shop Reports

By Keeping Equipment Maintenance Records in a Uniform Manner, Electric Railways in the Texas District Are Able to Compare Performance Results and Costs with Each Other and Decide Where Improvements Are Needed

FOR many years the master mechanics of the various electric railways in the Texas district under the Stone & Webster management have made monthly and yearly reports of their departmental work. These reports for the mechanical department gave performance statistics of various kinds, such as wheel mileage, trolley shoe and wheel data, lubrication costs, and various other information. When first started, the master mechanic of each company would compile these data for his company in any form he saw fit, and in greater or less detail, according to his fancy. This method had the disadvantage that the information given was not comparable with the reports of the mechanical departments of other companies under Stone & Webster management in the Texas district, because the methods of computation in each case were different.

The master mechanic of the Northern Texas Traction Company wished to compare his performance with that of other mechanical departments on the same basis, so he prepared several standard forms of shop reports. These have now been adopted as standard by the other Stone & Webster properties in the Texas district. Beginning with Jan. 1, 1924, all mechanical department monthly and annual reports were made out on these forms. This has served to stimulate interest among the master mechanics, and extreme competition within certain limits has resulted.

There are 19 report forms used, which are listed as follows: (1) Car Changes; (2) Pairs of Car Wheels Changed; (3) Car Wheels Discarded; (4) Armature Changes; (5) Average Miles Between Armature Rewinds; (6) Car Painting Costs; (7) Car Overhauling Costs; (8) Car-Miles; (9) Lubrication; (10) Brake Shoe Cost per Thousand Car-Miles; (11) Trolley Wheel Cost per Thousand Car-Miles; (12) Trolley Slide Cost per Thousand Car-Miles; (13) Total Current Collection Equipment Cost per Thousand Car-Miles; (14) Maintenance Cost per Thousand Car-Miles; (15) Total Cost of Carhouse Operation; (16) Number of Cars Washed; (17) Number of Cars Inspected; (18) Wrecker Calls; (19) Labor Turnover.

These reports are arranged to give data in a uniform manner regarding performance, costs, etc., for the current year or month, together with similar figures for the corresponding period a year previous. This permits easy comparison with former records.

For the convenience of the various companies comprising the Texas district and also for local information of the individual companies, the various subdivisions of power accounts are divided into additional classifications from that contained in the standard classification. A special form is also used for operating expense accounts for the railway. This form is reproduced herewith.

1. *Car Changes.* The form for car changes is made out monthly and includes a list of the principal changes made, such as car body, fenders, glass out, trucks, hot journals, brakes, air equipment, motors, control equipment, trolleys, wiring, accidents, and service changes. Two columns are arranged to tabulate information for each of these items, one for the current month and the other for the corresponding month of the previous year. A summary is given at the bottom of the form which includes the total average miles, car changes for the mechanical department and other departments, and the average miles per change for the mechanical department and for other departments. This information is also tabulated to give comparison for the current and previous year.

2. *Pairs of Car Wheels Changed.* The report of car wheels changed is made out monthly for all divisions. On this form the various defects which cause wheels to be removed are listed in separate columns for each diameter of wheel used. Monthly totals are given for the current and corresponding month of the previous year. The various defects listed are skidded flat, worn flat, flanges, journals, worn-out wheels, manufacturing defects, miscellaneous. Totals are given for the current and previous year.

3. *Car Wheels Discarded.* The form for car wheels discarded contains seven columns with headings as follows: Type, size, number of wheels, total life mileage this year, average mileage this year, number of wheels last year, average mileage last year.

4. *Armature Changes.* Information regarding armature changes is made out monthly and includes side headings of open circuit, shorted coils, grounded, commutators, loose bands, broken shaft, pinions, sleeve bearings, ball bearings, melted babbitt, and miscellaneous. Totals are given for the current month and corresponding month of previous year, together with the average mileage per change.

5. *Average Miles Between Armature Rewinds.* Information regarding the average miles between armature rewinds is tabulated monthly on a form with the following headings: Class, number in service this year, number rewound this year, per cent rewound, average miles, number in service last year, number rewound last year, per cent rewound last year, and average miles last year.

6. *Cars Painted.* Information regarding cars painted is tabulated for two classes, so as to give the number and average cost. The information is tabulated for the current and previous years. The various types of cars are listed and are divided according to service into city or interurban. A summary at the bottom gives the total number of cars painted.

7. *Cars Overhauled.* The form for cars overhauled is quite similar to that for cars painted and divides them into two classes, with the number and average cost. The cars are also listed according to type and service.

8. *Car-Miles.* This information is tabulated under three headings for the current year and for the previous year, so as to give the number of cars owned, the average miles per car and total miles operated. Cars are classified according to type and number of motors, and summaries are given for total miles of two-man cars, convertible safety cars, all types of city cars, all types of interurban cars, and totals for each company and for the entire system.

9. *Lubrication.* This information is tabulated so as to give the gallons or pounds of lubricant used, the total cost and the cost per 1,000 car-miles. Classification is made by divisions, and the various kinds of lubricants listed include car oil, air compressor oil, cup grease, gear lubricant, and other lubricants. A summary at the bottom of the sheet gives the total cost of lubricants for all divisions; the cost of packing, waste, etc.; cost of labor for lubricating cars; total cost of lubricating, including both labor and material, and the total cost per 1,000 car-miles.

10. *Brakeshoe Costs per 1,000 Car-Miles.* Information regarding brakeshoe costs is tabulated monthly and gives amounts for the current year and for the previous year. This is arranged by divisions and includes the

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total cost of shoes, total number of shoes, and the cost per 1,000 car-miles.

11. *Trolley Wheel Costs per* 1,000 *Car-Miles.* The information for trolley costs is tabulated in a manner quite similar to that of brakeshoe costs, and is divided into divisions with separate places for total cost of wheels, total number of wheels, average car-miles per wheel, and cost per 1,000 car-miles.

12. *Trolley Slide Costs per* 1,000 *Car-Miles.* The tabulation for trolley slide costs is also quite similar to that of 10 and 11 and is divided into divisions with headings for total cost of slides, total number of slides, average car-miles per slide, and cost per 1,000 car-miles.

13. *Total Current Collection Equipment Cost per* 1,000 *Car-Miles.* Information for the total cost of current collection equipment is tabulated for the various divisions and includes the total cost of collection equipment with the total cost per 1,000 car-miles.

14. *Maintenance Cost per* 1,000 *Car-Miles.* This information is tabulated

Types of Forms Used in Recording Equipment Repairs and Changes by Texas Traction Properties

FINANCIAL REPORT — OPERATING EXPENSE ACCOUNTS - RAILWAY

CO.

	PER CAR MILE (CENTS) THIS YEAR	PER CAR MILE (CENTS) LAST YEAR	FOR MONTH OF CURRENT YEAR	FOR MONTH OF PREVIOUS YEAR	FOR MONTHS CURRENT YEAR	FOR MONTHS PREVIOUS YEAR
BUILDINGS, FIXTURES & GROUNDS						
24.1 CAR HOUSES & SHOPS						
24.2 STATIONS & WAITING ROOMS						
24.3 OTHER BUILDINGS, FIXTURES & GROUNDS						
24.4						
TOTAL BUILDINGS, FIXTURES & GROUNDS						
PASSENGER & COMBINATION CARS						
30.1 CAR BODIES						
30.2 PAINTING CAR BODIES						
30.3 TRUCKS						
30.4 WHEELS						
30.5 AIR COMPRESSORS						
30.6 OTHER AIR EQUIPMENT						
30.7 FARE REGISTERING DEVICES						
30.8						
TOTAL PASSENGER & COMBINATION CARS						
FREIGHT, EXPRESS & MAIL CARS						
31.1 CAR BODIES						
31.2 PAINTING CAR BODIES						
31.3 TRUCKS						
31.4 WHEELS						
31.5 AIR COMPRESSORS						
31.6 OTHER AIR EQUIPMENT						
31.7						
TOTAL FREIGHT, EXPRESS & MAIL CARS						
SERVICE CARS						
32.1 CAR BODIES						
32.2 PAINTING CAR BODIES						
32.3 TRUCKS						
32.4 WHEELS						
32.5 AIR COMPRESSORS						
32.6 OTHER AIR EQUIPMENT						
32.7						
TOTAL SERVICE CARS						
ELECTRIC EQUIPMENT OF CARS						
33.11 PASSENGER CAR MOTORS						
33.12 EXPRESS CAR MOTORS						
33.13 SERVICE CAR MOTORS						
33.2 CONTROL APPARATUS						
33.3 COLLECTING APPARATUS						
33.4 POWER SAVING DEVICES						
33.5 OTHER ELECTRICAL EQUIPMENT						
33.6						
TOTAL ELECTRIC EQUIPMENT OF CARS						
MISCELLANEOUS CAR SERVICE EXPENSES						
67.1 CAR LUBRICANTS						
67.2 PACKING & WASTE FOR CAR LUBRICANTS						
67.3 CAR CLEANING MATERIALS						
67.4 TROLLEY ROPES, FUSES, LAMPS, ETC.						
67.5						
67.6 CONDUCTORS' PUNCHES, BADGES, ETC.						
67.7 OTHER CAR SERVICE EXPENSES						
67.8						
TOTAL MISC. CAR SERVICE EXPENSES						
CAR HOUSE EMPLOYEES						
70.1 LABOR—CLEANING & WASHING CARS						
70.2 LABOR—OILING & GREASING CARS						
70.3 LABOR—INSPECTION OF CARS & EQUIPMENT						
70.4 OTHER CAR HOUSE LABOR						
70.5						
TOTAL CAR HOUSE EMPLOYEES						

Cars Painted

Month of 19 SECTION NO. 6

	THIS YEAR Class No. 1 No.	THIS YEAR Class No. 1 Ave. Cost	THIS YEAR Class No. 2 No.	THIS YEAR Class No. 2 Ave. Cost	LAST YEAR Class No. 1 No.	LAST YEAR Class No. 1 Ave. Cost	LAST YEAR Class No. 2 No.	LAST YEAR Class No. 2 Ave. Cost
City D.T. Cars								
" S.T. Cars								
" D.T. Std. Safety Cars								
" S.T. " " "								
" Service Cars								
Int. Motor Pass. Cars								
" Pass. Trail "								
" Express Cars								
" Service Cars								
T.C.T. Co. Pass. Cars								
" Express Cars								
Total No. of Cars Painted								

Car-Miles

Month of , 19 SECTION NO. 8

TYPE OF CARS	THIS YEAR No. Cars Owned	THIS YEAR Av. Mi. Per Car	THIS YEAR Total Miles	LAST YEAR No. Cars Owned	LAST YEAR Av. Mi. Per Car	LAST YEAR Total Miles
City 4 Motor D.T. Cars						
" 2 " D.T. "						
" 2 " S.T. "						
Total Miles—Two Man Cars						
City 4 Motor D.T. Conv. Saf. Car						
" 2 " D.T. " " "						
" 2 " S.T. " " "						
Total Miles—Conv. Saf. Cars						
City 4 Mtr. D.T. Std. Saf. Cars						
" 2 " S.T. " " "						
Total Miles—Std. Saf. Cars						
City Service Cars						
Total—All Types City Cars						
Int. 4 Mtr. D.T. Pass. Cars						
" 2 " D.T. " Trailers						
" 4 " D.T. Express Cars						
" 4 " D.T. Service Cars						
" Pass. Trailers (No Mtr.)						
Total—All Types Int. Cars						
Total Miles—N.T.T. Co.						
T.C.T. Co. 4 Mtr. D.T. Pass. Cars						
" 4 " D.T. Exp. "						
Total Miles—T.C.T. Co.						
Total Miles—Entire System						

Car Changes

Month of , 19 SECTION NO. 1

	THIS YEAR	LAST YEAR
Car Body		
Fenders		
Glass Out		
Trucks		
Hot Journals		
Brakes		
Air Equipment		
Motors		
Control Equipment		
Trolleys—Wiring		
Accidents		
Service Changes		
Total		
Average Miles		
Car Changes—Mech. Dept.		
" " Other "		
Ave. Miles per Change, Mech. Dept.		
Ave. Miles per Change, Other Dept.		

Lubrication

Month of , 19 SECTION NO. 9

KIND OF LUBRICANT	GALS. OR LBS. AMOUNT USED 19	GALS. OR LBS. AMOUNT USED 19	TOTAL COST 19	TOTAL COST 19	COST PER MCM 19	COST PER MCM 19
FORT WORTH DIVISION						
Car Oil						
Air Comp. Oil						
Cup Grease						
Gear Lubricant						
Other Lubricants						
TOTALS						
INTERURBAN DIVISION						
Car Oil						
Air Comp. Oil						
Cup Grease						
Gear Lubricant						
Other Lubricants						
TOTALS						
T.C.T. Co. DIVISION						
Car Oil						
Air Comp. Oil						
Cup Grease						
Gear Lubricant						
Other Lubricants						
TOTALS						
ALL DIVISIONS						
Car Oil						
Air Comp. Oil						
Cup Grease						
Gear Lubricant						
Other Lubricants						
TOTALS						

Total Cost of Lubricants (All Divisions)
Cost of Packing, Waste, etc.
Cost of Labor for Lubricating Cars
Total Cost of Lubricating (Labor and Mater ıl)
Cost Per M.C.M.

Armature Changes

Month of 19 SECTION NO.

	THIS YEAR	LAST YEAR
Open Circuit		
Shorted Coils		
Grounded		
Commutators		
Loose Bands		
Broken Shaft		
Pinions		
Sleeve Bearings		
Ball Bearings		
Melted Babbitt		
Miscellaneous		
Total		
Average Miles Per Change		

Pairs of Car Wheels Changed

Month of , 19 SECTION NO. 4

ALL DIVISIONS

	21"	22"	24"	26"	30"	33"	34"	36"	37"	This Yr. Tot.	Last Yr. Tot.
Skidded Flat											
Worn Flat											
Flanges											
Journals											
Worn Out Wheels											
Mfg. Defects											
Miscellaneous											
Total This Year											
Total Last Year											

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monthly and contains columns for total cost and cost per 1,000 car-miles for the current and previous year. The various types of cars are listed and divided into city and interurban classes. A summary is given for all cars.

15. *Total Cost of Carhouse Operation.* The cost of carhouse operation is arranged to show comparative figures for the current and previous year under the headings of cost of carhouse operation, cost per 1,000 car-miles, cost of inspecting cars, cost per 1,000 car-miles for inspection, cost of cleaning cars, cost per 1,000 car-miles for cleaning.

16. *Number of Cars Washed.* The information tabulated for the number of cars washed gives only the number of the city and interurban cars washed for the particular periods.

17. *Number of Cars Inspected.* Information regarding cars inspected is given for regular and light inspection and includes the number of city and interurban cars inspected in each class.

18. *Wrecker Calls.* Information regarding wrecker calls is tabulated for the current and previous year under the headings of fires, car failures, derailments, obstructions on track, collisions, and miscellaneous. Totals are given for corresponding periods each year.

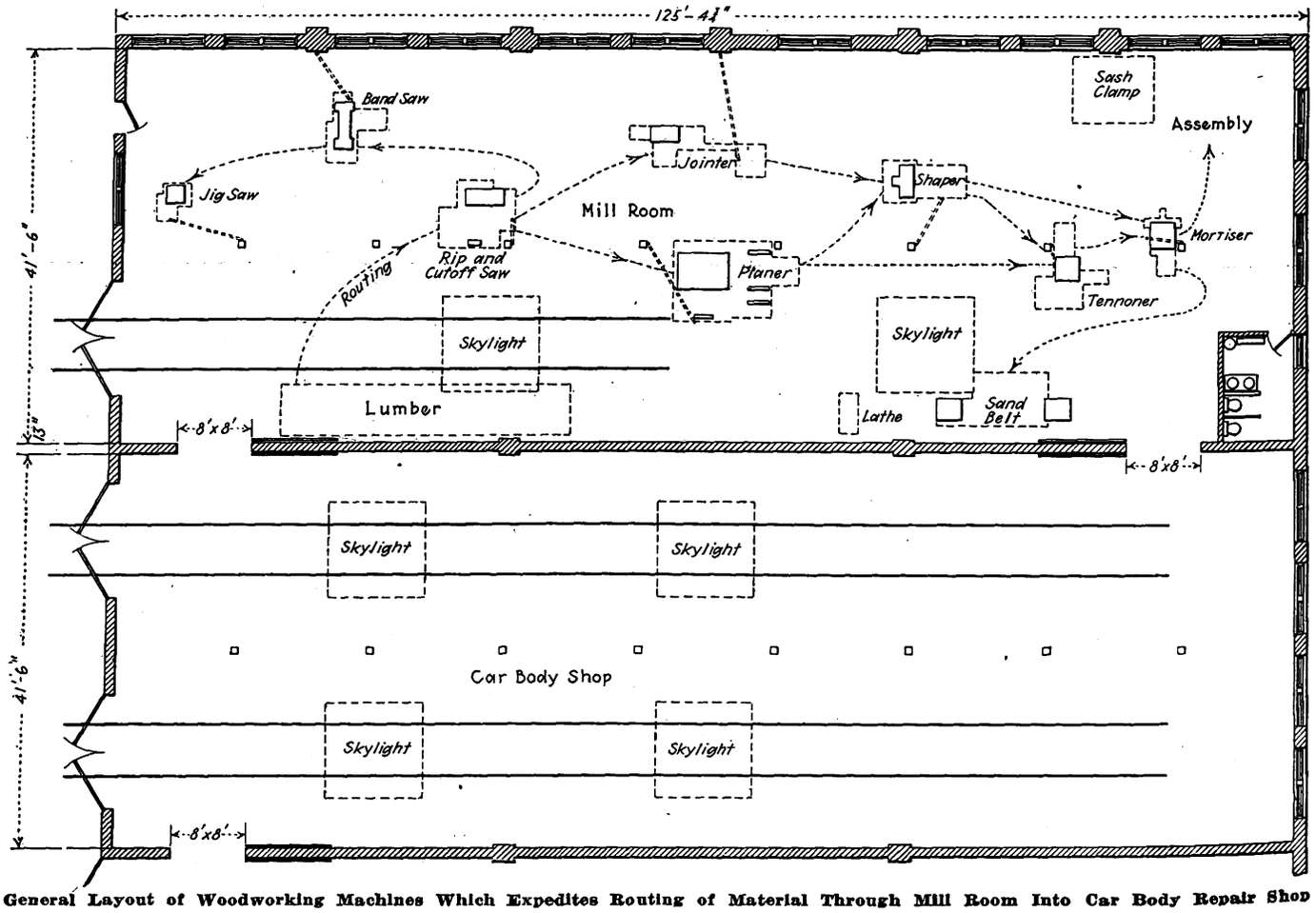
19. *Labor Turnover.* Information regarding labor turnover is tabulated under the headings of number of regular men hired, number of extra men who left service, number of regular men who left service, number of extra men hired, and number of regular men in service.

Carhouse Converted into a Shop

Ample Space Was Available and Individual Motor-Driven Tools Were Located to Facilitate Direct Routing of Work in Columbus, Ohio

TWO sections of an old carhouse of the Columbus Railway, Power & Light Company were taken over recently by the shops department after the company disposed of its summer cars. Each section is 41 ft. 6 in. wide and 123 ft. 4¾ in. long. One is used as a mill room and the other as a car body repair shop. Tracks were left in the body repair section and a plank floor laid even with the top of the rails. The mill room section of the building has an outside side wall with eleven large windows in it. Skylights have been placed in the roof of both rooms. Two are located over each track in the car body repair shop and two are located in the mill room near the partition between the two sections. Combined with the white-painted walls and ceilings these make the room especially light and attractive during the daytime.

Artificial illumination is furnished in the mill room by three rows of 100-watt, 110-volt lamps in dome reflectors mounted about 12 ft. above the floor. This height and the spacing give uniform illumination on the floor without wasting light. In the car body repair shop a row of dome reflectors has been placed adjacent to the roof-supporting columns. In addition, rows of 150-watt lamps with scoop-shaped reflectors along two side walls throw the light against the car. Each lamp has an individual snap switch on a drop cord.



General Layout of Woodworking Machines Which Expedites Routing of Material Through Mill Room Into Car Body Repair Shop

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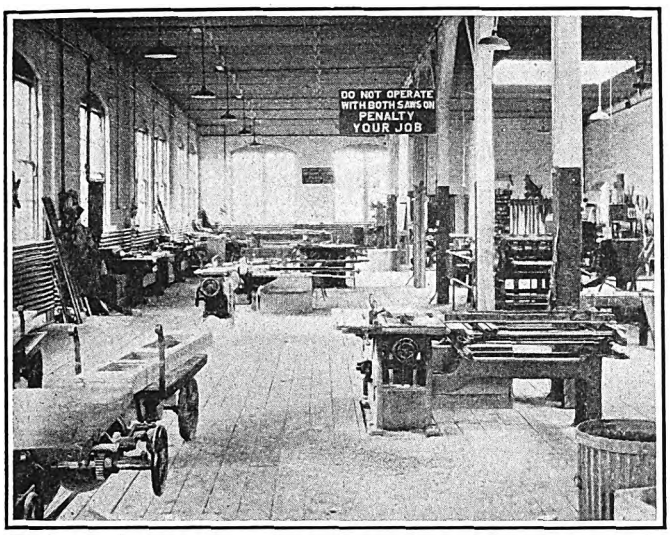
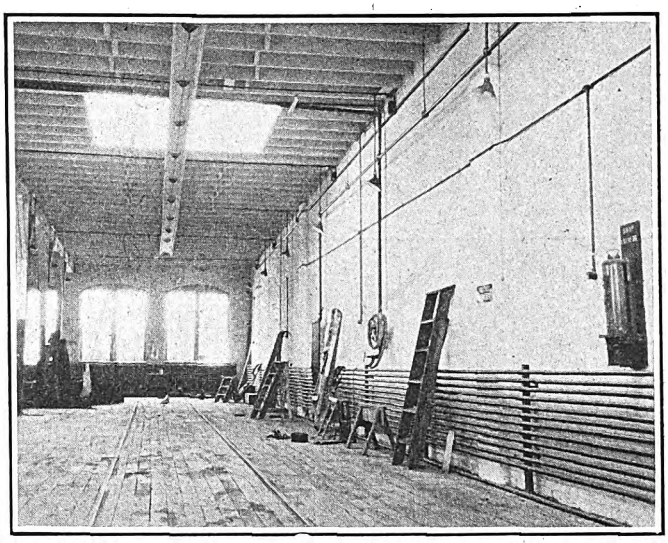


New Mill Room of Columbus Railway, Power & Light Company Was Formerly Part of an Old Carhouse



Car Body Repair Room, Adjacent to the Mill Room, Is Large Enough to Accommodate Four Cars

Because generous floor space was available, the various wood-working machines have been spaced so that there is ample room around every one. As each machine is driven by an individual motor, it was possible so to place them that the best routing of material through the shop was obtained. A short length of track enters the mill room at one corner. The rough lumber is brought in on flat cars and placed between the track and the wall. On the other side of the track is located the combination rip and cut-off saw, while immediately in line with this is the planer and jointer. Following in line toward the rear of the room are the shaper, tenoner, mortiser and sanding machine. Specialized and curved work is taken care of by a band saw and a jig saw located at the front of the shop somewhat out of line with the other machines. Assembly of sashes and doors takes place in the rear corner of the room, where clamps, gluepot and assembly benches are provided. The finished product is taken through the doorway at the rear or front end of the shop into the car body repair shop, or on into the mill work storeroom.

All Motor Repairs Made at Shop

By R. S. Neal
Assistant Superintendent of Equipment
Kansas City Railways

For some time it has been the practice of the Kansas City Railways to make no motor repairs at the carhouses. Regardless of what the failure may be, the entire motor is removed from the truck and is sent to the shops.

It is felt that there is considerable advantage to be gained from this practice, as the shop is better qualified and equipped to take care of the various motor repair jobs than are the carhouse forces. More uniform results and a higher degree of workmanship in fitting armature and axle bearings and similar classes of work are obtained where this work is carried out by a comparatively small number of highly trained specialists under the direct supervision of the shop management. Armatures are handled to better advantage than in the carhouses and there is consequently less possibility of serious damage to this expensive equipment when it is being put into the motor case. Heretofore it was the practice to move armatures back and forth between the shop and the carhouses on a car specially equipped for this purpose. In spite of these precautions, however, there is no doubt that considerable damage was done in handling them.

Another important motor maintenance practice which has cut down the number of failures in service and has reduced repair costs is the elimination of field coil terminals. This, of course, has been largely made possible by concentrating all the motor repair work at the shop. The leads are brought out directly from the field coils and permanently joined together. This practice is being followed on GE-67, GE-70, GE-80, and West.-306 motors. On box-frame motors this form of installation is not entirely satisfactory, but it is planned to extend the practice to that type of construction when a special machine, now under consideration, for making the installation is completed. On the GE-57 type of motor it is at present almost impossible to handle several coils connected together on account of the excessive weight. At the present time, however, the brass field coil spools in these motors are being removed, and the coils are being made up similar to those on other types of equipment. It is expected that this construction will make it practicable to connect the coils together and eliminate the terminals.

A very important advantage is obtained from the practice of making all motor repairs at the shops, in the matter of field coil maintenance. When the motor work is done at carhouses, certain types of field coil defects are very difficult to detect. Unless some very serious defect develops, which shows up in flashing or burning of the armature, there is a strong tendency to allow motors to continue in service until serious damage occurs. When motors are sent in to the shop for routine bearing, gear and armature maintenance, a much more careful and thorough check of the condition of field coils is possible. The saving in this one item alone probably more than justifies the practice of sending the complete motors to the shop.

Investigation has shown that there is very little if any increased cost for labor and handling due to sending in the complete motors. This is particularly true of box-frame motors. The results of the practice in Kansas City have been so satisfactory from the standpoint of reducing failures in service that it is considered an important improvement.

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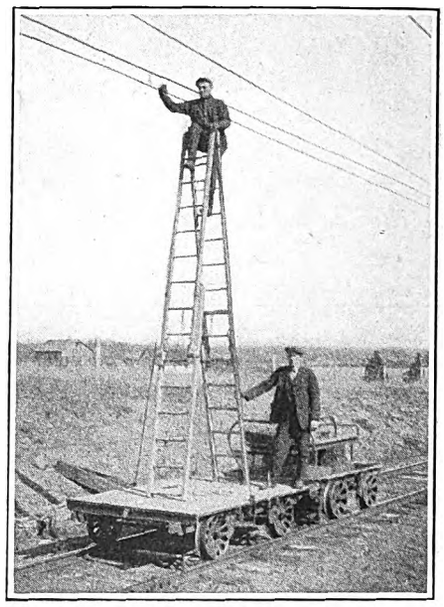
Keeping Down Line Maintenance Costs on a Small Interurban

A 1-Ton Ford Truck Equipped with Extension Ladders Is Used as a Line Wagon

On the New Haven & Shore Line Railway a Few Skilled Men Divide Their Time Between Repair Work on the Overhead Structure and on the Rolling Stock and Track — A Gasoline-Propelled Line Car Is Used —Catenary Construction Reduces Maintenance Expense



Trouble Hunting on Private Right-of-Way Is Done with a Gasoline-Propelled Rail Car and Trailer

DURING the year and eight months since service was resumed on the New Haven & Shore Line Railway, Guilford, Conn., careful attention has been given by William Walker, general manager, to every means of reducing operating expense. This has resulted in keeping down the cost to an average of 20.03 cents per car-mile in 1924. Of this, 2.27 cents was for maintenance of way and structures, including overhead lines. It is estimated that only about one-third of the latter amount, or somewhat less than 1 cent per car-mile, is chargeable to maintenance of the overhead construction. A total of less than $1,000 has been spent for this purpose during the entire period since the railway was reorganized in 1923.

A detailed account of the way in which the reorganization was accomplished was published in ELECTRIC RAILWAY JOURNAL for Sept. 6, 1924, page 343. Certain changes which were made in the methods and equipment used for power generation and distribution have had an important influence in reducing the cost of operation.

ORIGINAL DESIGN WAS FOR 1,200 VOLTS

The road was originally built in 1910 to operate at 1,200 volts, d.c., Power was generated by 25-cycle, three-phase Curtis turbines at the company's own station at Saybrook, the eastern terminus of the line. At this point there was also a substation equipped with three General Electric 600-volt, 200-kw. rotary converters. Two of these were operated in series to furnish power at 1,200 volts. The third machine was a spare. Later a fourth was added, which made it possible to operate two sets when desired.

At Guilford, 18 miles from Saybrook and 16 miles from the western terminus of the line at New Haven, a second substation was located. Equipment similar to that at Saybrook was used. Between these places there was a high-tension transmission line and from Guilford to Foxon Park, on the outskirts of New Haven, there was a 500,000-circ.mil feeder line.

Overhead construction was of the three-point catenary type, designed by the General Electric Company and the Sperry Engineering Company. The latter company was also the builder of the line, including tracks, overhead structures, buildings, etc. Present low maintenance costs are made possible largely by the quality of the original construction. A seven-strand steel messenger wire was used with No. 000 grooved copper trolley wire. These were suspended from bracket arms on wood poles spaced 150 ft. apart. All the smaller parts used in the overhead structure were sherardized instead of being galvanized. The latter process was used only for such pieces as bracket arms, which were too large for sherardizing treatment. The material so treated has stood up well during the intervening years despite the corrosive effect of the salt air which is always present along the shore of Long Island Sound.

Originally cars weighing nearly 60,000 lb. were operated by four 600-volt motors connected two in series. In the city of New Haven the Shore Line cars operated over the tracks of the Connecticut Company, where the trolley voltage was only 600. In the beginning this was done without changing the motor connections so that they ran at half speed, resulting in extremely slow operation. Commutating switches were installed at a later date to permit operating the motors in parallel.

In 1919 all service on this railway was suspended, as told in the article already referred to. This condition continued until the summer of 1923, when,

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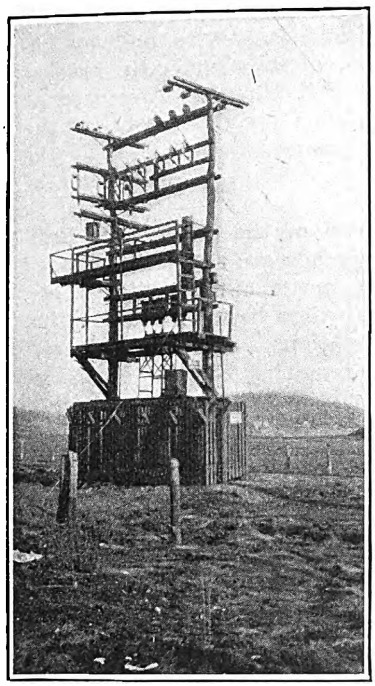
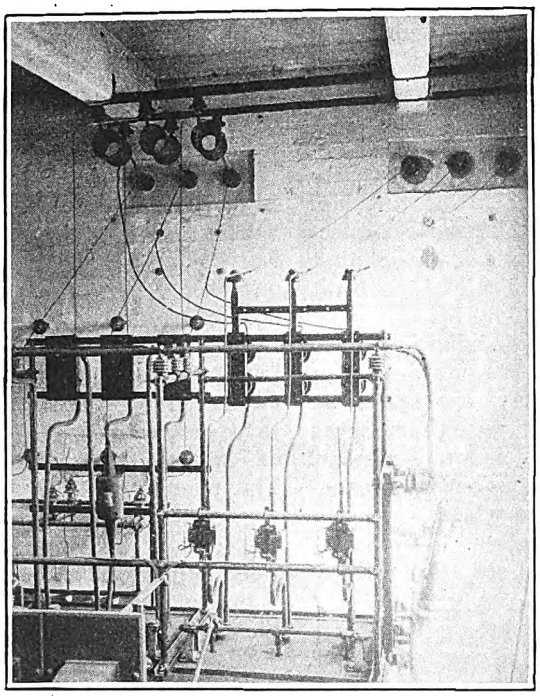
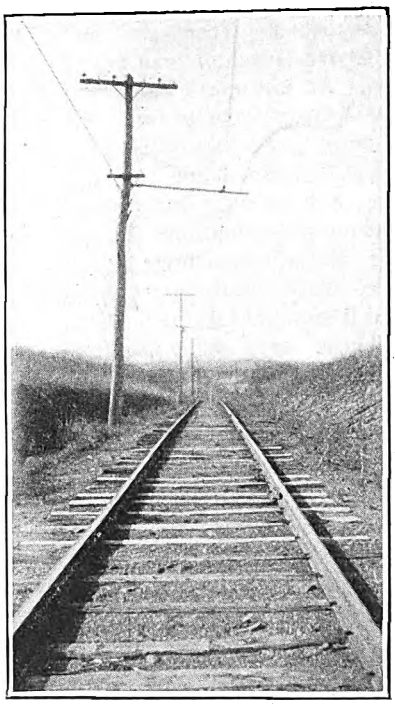


At Left — Where Purchased Power Is Metered the Automatic Oil Switch Is Protected by Two Sets of Fuses. This Cut-Out Switch Can Be Reset from the Power Station, 3 Miles Away



Center—The High-Tension Line Is Brought Into the Guilford Substation as Shown Here. An Automatic Oil Switch Has Been Installed at This Location



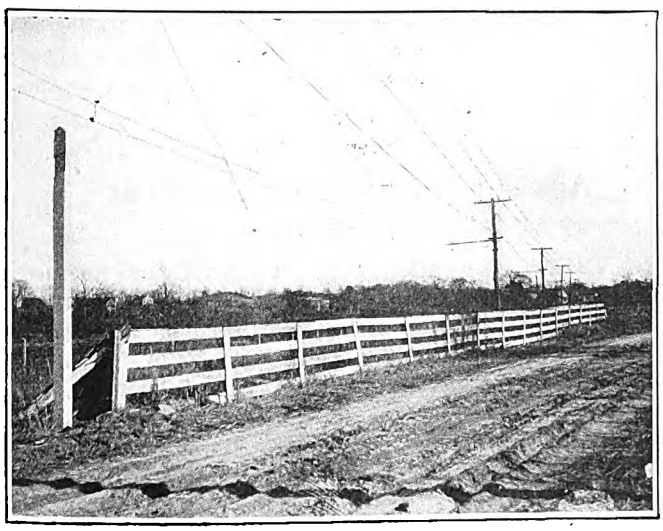
At Right—Messenger and Trolley Wires Are Suspended from Bracket Arms. The Transmission Line Is Carried on Cross-Arms at the Top of the Poles

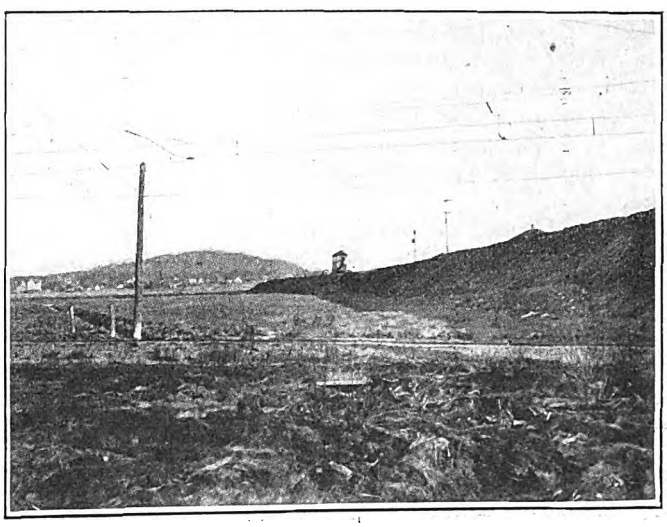
despite many handicaps and discouragements, a reorganization was effected under the auspices of F. E. Kington & Company, bankers of New Haven. Twenty months ago service was resumed after an interruption lasting almost four years.

Changes for 600-Volt Power Supply

At this time extensive changes were made in the rolling stock and methods of power distribution. It was decided to operate at 600 volts instead of 1,200 volts. New substations were built at Totoket, half way between Guilford and New Haven, and at Grove Beach, 6 miles from the eastern end of the line. These were equipped with two rotary converters each, taken from the Saybrook substation, which was discontinued. After four years of idleness these machines were put back in service after being subjected to only a short drying out process. This was all that was needed, however, and little trouble has been experienced with them.

It was arranged to purchase power from the Connecticut Company at New Haven instead of generating it at Saybrook. Connection is made at a point about three-quarters of a mile beyond the beginning of the Shore Line tracks. An 11,000-volt, three-phase, 25-cycle transmission line is connected through a set of fuses and an automatic oil cut-out switch to a recording wattmeter. From there it goes through a second set of fuses to the transmission circuits of the Shore Line Railway. An interesting feature of this installation is that the oil switch can be reset from the Connecticut Company's power house, 3 miles away. Otherwise it would be necessary for a man to make the long trip from Guilford to reset it. The arrangement of the equipment is shown in an accompanying illustration.





This Three-Point Catenary Construction Has Been a Factor in Keeping Down Line Maintenance Cost. On Curves Wood Strain Insulators Are Used in the Manner Shown

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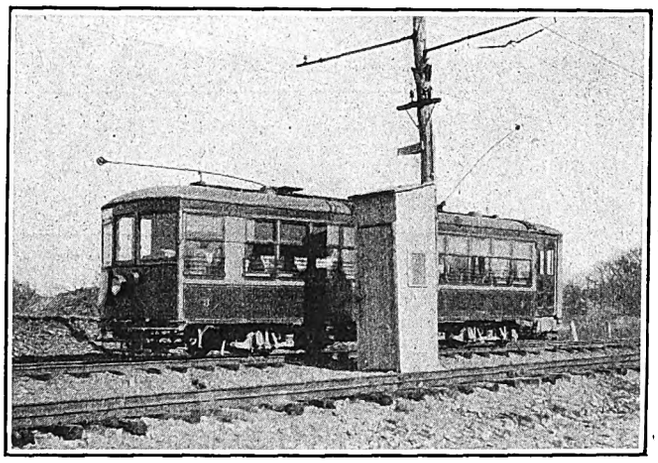
A new transmission line was built from New Haven to Guilford. From that point to the new substation at Grove Beach it was possible to make use of the old line. An automatic oil switch has been installed inside the Guilford substation. This is set lower than the one at New Haven, so that the former will trip out first in case of overload and perhaps save the latter from tripping out at all. Its present location inside the substation is convenient for resetting. Formerly protection was afforded only by fuses mounted outdoors on a pole. Altogether, approximately 24 miles of 11,000-volt line is now maintained by the railway.

These arrangements for power distribution have worked out entirely satisfactorily. Last summer, when traffic was at its height, the railway was operating four regular passenger cars, two or sometimes three extra passenger cars, five stone cars and a work car. Despite these heavy demands no trouble has been experienced with low voltage. During the winter it is possible to shut down the Totoket substation.

In addition to the transmission lines, the railway



A Typical Telephone Station on the Shore Line Railway. All Train Movements Are Regulated by Telephone. No Signals Are Used

has 2 miles of private telephone lines and 20 instruments. All train dispatching is done by telephone. Special train movements are arranged by the dispatcher when necessary. There are no signals.

Except for the changes mentioned in the foregoing paragraphs, the overhead construction is the same today as when the railway was originally built. The messenger wire, braces and pull-offs are in good condition. Wood strain insulators used on curves have stood up well. The copper trolley is somewhat worn in places, but not to an extent that seriously affects its usefulness. It is planned in the future to use clinch ears at certain locations where the groove is now rather badly worn.

The good condition of the trolley wire is the more remarkable because the old cars for a time were equipped with cast-iron trolley wheels. These were found to be so injurious to the copper trolley wire, however, that their use was eventually discontinued. The present cars are equipped with More-Jones type VK 6-in. copper trolley wheels. These have been found to have an average life of 4,210 miles. Whenever conditions require it sleet cutters of a type made by the Connecticut Company are used. This has been necessary but a few times during the past two years.

Catenary construction has been a factor in keeping the cost of line maintenance low. There is no quick change from a comparatively slack wire midway between poles to a rigid section directly under the bracket arm as with direct suspension. Cars are operated at speeds of 35 to 40 m.p.h. on private right-of-way and the wire has shown no sign of excessive wear. Few breaks have occurred and there has been no indication of crystallization.

The maintenance personnel of the Shore Line Railway has varied duties. Two men are regularly engaged on track repairs, greasing curves, oiling switches, etc. Two other men divide their time between maintaining the overhead lines and substations, inspecting and overhauling cars, and bonding, repairing bridges, etc. Two days each week are ordinarily devoted to each of these three occupations. On Sunday the four regular men are off and a fifth serves as all-around emergency man. The men are paid well and like the variety in their work. As a "Jack-of-all-trades" a man earns higher wages than would be paid to the ordinary six-day-per-week railway repair man.

Considerable rail bonding has been done recently by the company. Although the original line was adequately bonded throughout, many bonds were stolen during the four years when the road was not in operation. It has been necessary, therefore, to devote special attention to installing bonds. This is done by electric arc welding.

Some work has had to be done also on the replacement of wood poles. Approximately 15 new poles have been installed during the past eighteen months. For this purpose untreated chestnut poles are used and have been found to be entirely satisfactory.

On account of having considerable trackage in paved streets in addition to the open track on private right-of-way the company has both a line wagon and a line car. The former is a one-ton Ford truck, on the back of which have been mounted two extension ladders, joined together at their upper ends and hinged to the floor. Removable ¼-in. bolts are used as hinge pins. This arrangement makes it possible to take the ladders off the truck without difficulty.

For work on private right-of-way a Fairmont gasoline-propelled rail car and trailer are used. The same ladders which are mounted on the Ford truck can be mounted on the trailer by attaching them to a duplicate set of hinges. This light vehicle can negotiate the rather steep hills at a good speed and has proved of great value. Gasoline propulsion is an advantage when hunting trouble with the trolley dead. The trailer is so light that it can be easily lifted off the rails to allow a regular car to pass and can then be replaced by the two men in the line maintenance crew.

Advisory Council for Accident Prevention

ACCIDENT prevention work on the Chicago Surface Lines, described in the ELECTRIC RAILWAY JOURNAL for Feb. 21, page 313, has been carried on through a general advisory council headed by V. T. Noonan, supervisor of accident prevention. Other members of the council are as follows; H. H. Adams, superintendent of shops and equipment; C. H. Evenson, superintendent of transportation; H. B. Fleming, chief engineer; F. M. Hamilton, supervisor of purchases and stores; A. J. Klatte, assistant electrical engineer; F. L. Kriete, general attorney, and E. L. Kuntzner, secretary.

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Interurban Railway Puts Way Maintenance on a Competitive Basis

Inspection of Track and Roadway Made on the T. H., I. & E. Lines as a Basis of Awarding Prizes for Careful Maintenance Also Furnishes Useful Information for Budget Making

By D. H. Walker
Assistant Engineer Terre Haute, Indianapolis & Eastern Traction Company

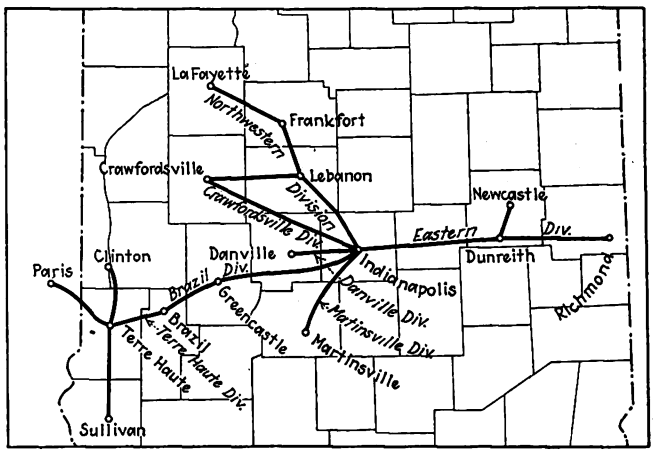
AN INSPECTION of track and roadway for the purpose of awarding prizes to the various divisions and sections having the best track after completion of the year's work was made by the Terre Haute, Indianapolis & Eastern Traction Company in December, 1924. In the spring the chief engineer had told the division supervisors that prizes would be awarded by the company to those having the best sections at the end of the year. The matter was then forgotten for a while but later the question arose as to the basis on which the prizes should be awarded. It was decided to make an inspection trip over all divisions and to give the prizes to those sections and divisions which had achieved the best results as shown by this inspection.

In addition to being a basis for awarding prizes the trip was expected to accomplish other results. Expenditures on the track for the past year had been made in accordance with a budget prepared at the beginning of the year. A new budget for 1925 was at that time in course of preparation and it was felt that an inspection of the entire system would help to give a clear impression of what had been accomplished and would show which sections would require the greatest expenditures for the coming year.

Moreover, it was thought that each supervisor would benefit by an inspection of the entire system. Supervisors of the various divisions had been busy with their own work and had had no opportunity to inspect the work of the other divisions. Meetings had been held twice each month with the roadmaster and the work outlined to all alike. Visible evidence of how the other man had carried out these instructions was deemed advisable. That this inspection would help to stimulate competition by showing the man with poor track that he had much to do to bring his work up to the standard was another point in favor of the plan. Such an inspection would also instill pride in the man with good track and encourage him to maintain his high standards.

As every man takes more interest in his own work when he finds that others are interested in it too, it was thought that the morale of the track department would be improved by including the general superintendent and other officials of the company among those making the trip. The superintendent of distribution found that the inspection would afford him a good opportunity of making a careful study of the overhead lines and he, therefore, joined the party. Besides those already mentioned the inspection party included the purchasing agent, the chief engineer, four superintendents of divisions, four supervisors of roadway, the roadmaster and assistant roadmaster, two assistant engineers, and the foreman of bridges and buildings. For part of the trip the chief dispatcher and master mechanic accompanied the others.

Three days were occupied by the inspection. A special car was used and each run was made either as the second section of a limited train or as an extra. The car used was well suited for inspection purposes, being of the observation type as shown in the accompanying illustration, with ample room at the front end for those making the inspection to get a good view of the track.



The Terre Haute, Indianapolis & Eastern Traction System Is Operated in Seven Divisions

The lines of the Terre Haute, Indianapolis & Eastern Traction Company radiate from Indianapolis as a center, as shown on the accompanying map. The Brazil and Danville lines constitute a division under one supervisor. The Crawfordsville and Martinsville lines make up another division. The Northwestern division includes the lines from Indianapolis to Lafayette and from Lebanon to Crawfordsville. The Eastern division embraces the track from Indianapolis to Richmond and the branch from Dunreith to Newcastle. By considering these four groupings the number of sections were about equal in all divisions. It was necessary to "back track" somewhat in making the inspection, but this offered the inspectors an additional chance to recheck any features in doubt on the first examination. Approximately one day was given to each division.

For the purpose of rating the sections, grades were marked by the inspectors on four groups of subjects. Each group was assigned a specified number of points under the three markings of Good, Indifferent, and Poor. The card shown on the following page is a sample of those prepared by the inspectors on each division.

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Terre Haute, Indianapolis and Eastern Traction Company

REPORT OF CONDITION OF TRACK

...Eastern.....DIVISION

B. Adkins.....SUPERVISOR...Dec. 1924.....192..

SECTION NO.	FOREMAN	GROUP NO. 1 Fence and Drainage	GROUP NO. 2 Surface, Ballast, Line and Joints	GROUP NO. 3 Siding, Switch Stand and Lamps	GROUP NO. 4 Farm and Road Cross-ings, Right of Way, Station Grounds	TOTAL
MARK THUS	GOOD	42	18	16	8	84
	INDIFFERENT	34	16	12	6	68
	POOR	18	12	4	2	36
1	Earl Bell					
2	O. Mattix					
3	W. Wyremon					
	TOTAL					
	AVERAGE					

Form Used by Inspectors in Grading the Various Track Sections

Fences and drainage were the principal items in the first group. Special attention was paid to alignment and condition of posts and gates, cleanliness of side ditches, freedom of culverts from obstruction, and condition of the embankment. Surface, line, ballast and joints were included in the second group. Inspectors were asked to note the alignment of track, both tangent and curve, riding quality at entrance to curves, ballast line at shoulder just outside edge of the tie and at the toe of the slope, condition of weeds, and the riding quality of joints.

The third group included sidings, switch stands and lamps. Attention was paid to cleanliness of side tracks, fit of switches, whether switches were properly oiled and had head rods in the correct position, whether switch lamps were plumb, clean and burning and whether the light was in focus with the bull's eye. Farm and road crossings, right-of-way, and station grounds constituted the fourth group. Attention was paid to whether planks were properly renewed and box crossings filled, whether the surface of the roadway at crossings was properly filled around the track joints, whether the shoulder of the bank was weed grown, and the general cleanliness of the ground around stations and shelter houses.

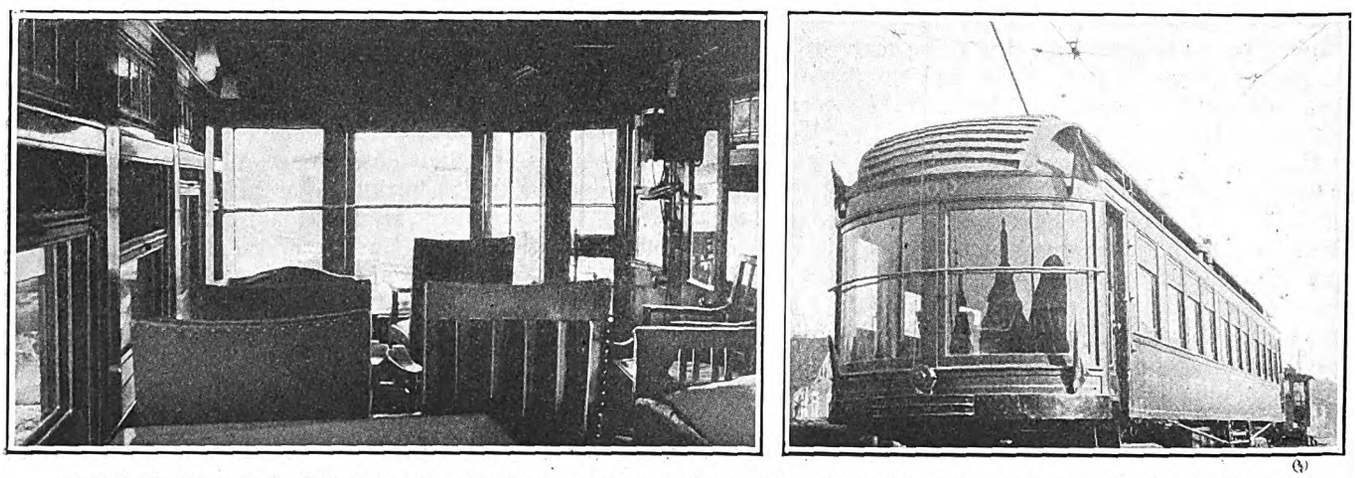
Since so many points were considered in each group, the grading was done by two men. The purchasing agent, the superintendent of distribution, a division superintendent and an assistant engineer took the four groups with one of the supervisors assisting each man. The foreman of bridges and buildings acted as alternate and substituted on each division for the supervisor whose territory was being covered.

In the final grading of divisions and sections consideration was given by the office, after all inspectors' reports were in, to the amount of money spent on each division during the year. The committee markings were averaged for all groups. Then track expenditures per mile for labor and material were figured for each division and the average for all divisions. The percentage of each division, as compared to the average, was used in revising the markings as follows:

	Per Cent of Average Expenditure	Committee Markings	Revised Markings
Eastern and Newcastle Branch	198.2	76.43	38.56
Northwestern and Crawfordsville Branch	72.3	73.50	101.66
Crawfordsville and Martinsville	48.6	73.81	151.81-1st
Brazil and Danville	62.3	75.36	119.82-2nd

Prizes of $25 and $15 were awarded on this revised basis to the two supervisors. Section prizes of $15, $10 and $5 were awarded to each division in accordance with the committee markings. Vouchers with the following inscription: "First (etc.) prize for meritorious work on your section during the summer of 1924," were sent to the winners the day before Christmas.

Some changes in the method of marking have been decided upon for the next inspection. Henceforth, four classifications will be used, Good, Fair, Indifferent and Poor. Values given the group markings will also be changed somewhat. It was found that with the values used the difference between good track and bad track could be more than counterbalanced by fences and drainage. The ideal way, the railway believes, would be to have as inspectors men not connected with the company but who are familiar with track and roadway work. Then grading could be on an absolutely fair basis with no prejudice because of any knowledge of actual conditions and reasons why one division should be better than another. Such results could then be revised more fairly in accordance with expenditures.



At Left, the Rear End of the Inspection Car Is Arranged for Observation. At Right, a Good View of the Track Ahead Can Be Obtained Through the Windows at the Front of the Car

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Double-Head Welder Cuts Wheel Maintenance in Detroit

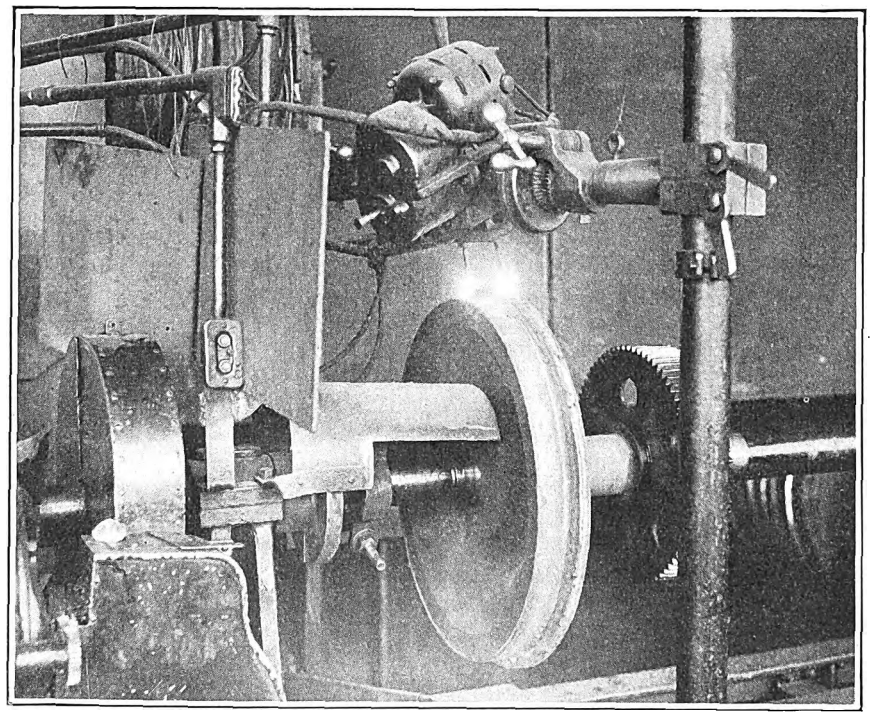
By A. C. Colby
Superintendent of Equipment, Department of Street Railways, Detroit

Time of Welding Wheels Reduced Almost Half by Addition of Second Head on Automatic Welder — Special Grinder Increases Mileage by Reducing Amount of Metal Removed

ROLLED steel wheels used by the Department of Street Railways in Detroit are welded and ground when the flanges become worn, with a view toward obtaining maximum wearing life. This is accomplished by reducing to a minimum the amount of metal that must be removed from the treads of the wheels to true up their contours after they have become worn in service.

The practice of welding flanges, either with automatic or hand equipment, has been adopted by many properties. Results with automatic equipment have been reported uniformly satisfactory, but some difficulty has been experienced with hand welding. When only a comparatively small number of wheels are to be welded, however, some properties are using the hand method with apparent success.

One feature of the Detroit practice is the use of a double-head welding machine to speed up the rate of welding. This lays two beads of metal on the wheel flange simultaneously instead of one bead per revolution, as in the case of a single-head machine. It was found to be a comparatively simple matter to add the second welding head to a single-head machine, thereby almost doubling its capacity. The cost of welding any particular wheel depends of course on its condition, but for a given wheel, the double-head machine reduces by almost half the time formerly taken with the single welding head.



A Second Head Has Been Added to the Automatic Welder
Two beads of metal are deposited simultaneously and the total time required is reduced almost half. Note the guard to protect the journal from particles of metal.

Welded Wheels Are Trued by Grinding

After welding, the contour of the wheel is trued up by grinding the tread and flange instead of turning. This results in the removal of a minimum amount of material from the wheel. Consequently, a considerable saving in the amount of metal removed from the wheel is made as compared with the customary practice of turning the wheels either with or without flange welding. To make grinding a success, however, the wheels must be attended to before they become worn beyond a certain stage. If one of the flanges is permitted to wear excessively thick, grinding is no longer satisfactory or economical, and it is better to turn the wheels to restore their contour.

The A. E. R. E. A. standard limit-of-wear gage is used by the Department of Street Railways for determining when wheels should be taken out for attention. If they are removed promptly after reaching the limit shown by this gage, the flange and tread are usually found to be in condition which permits them to be repaired by welding and grinding.

An accompanying illustration shows the welding machine in operation. This is the standard type of General Electric Company automatic equipment, and the arrangement of the two welding heads is clearly shown. No difficulty has been experienced in feeding the welding rod from each head so that the material is deposited uniformly on the wheel.

The grinding machine is shown in a second illustration. This was built by the Norton Company, Worcester, Mass. The grinding wheels are shaped so as to finish the flange and tread simultaneously. The accompanying sketch shows the shape of the grinding wheel. When these wheels become worn, they are returned to the manufacturer for redressing. After the throat and flange are finished, there is a sharp corner left at the back of the flange which must be ground off. Some

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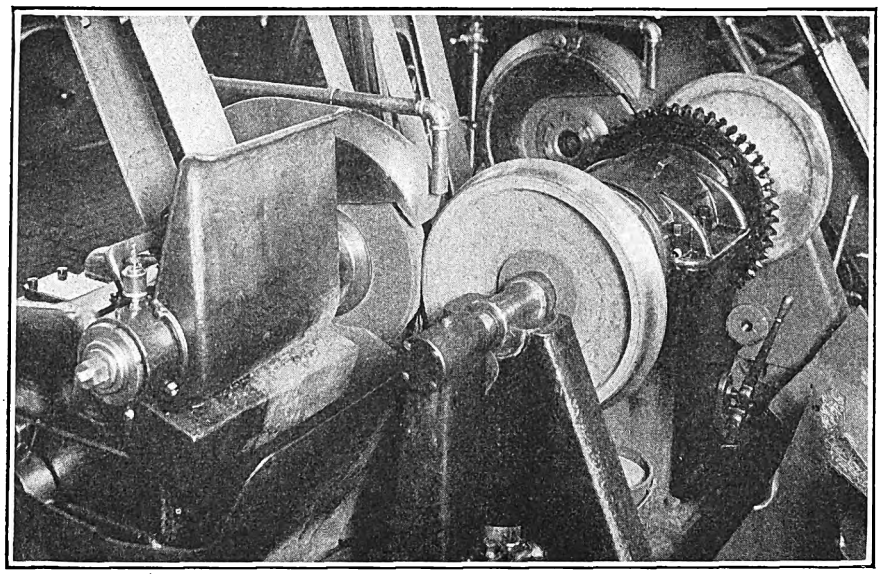


This Grinder Was Built Specially for Truing Up Wheels After Welding

saving in time has been made by cutting this corner off with an acetylene torch, and then finishing with the grinder.

Subsequent to the installation of the grinder by the Department of Street Railways, a similar machine was installed in the River Rouge plant of the Ford Motor Company and is used for grinding locomotive wheel tires.

Costs of Welding and Grinding

Comparative figures compiled for the month of October, 1924, show the costs of welding and grinding wheels. During that month a total of 485 labor hours were required for welding 250 wheels, of which approximately half had a nominal diameter of 34 in., and the other half 26 in. On both welding and grinding work, one man handles the machine. The rate of pay is 80 cents per hour. In the case of welding, the average time per pair of wheels was 1.94 hours, which makes the labor cost without overhead $1.55. This is an average figure for both the 34-in. and 26-in. diameter wheels.

There were 200 pairs of wheels ground during this month in 246 labor hours, or at the rate of 1.23 hours per pair of wheels. The labor cost for grinding was consequently 98 cents per pair. In addition to labor, there must be added the cost of welding material and power. These costs have been established as follows:

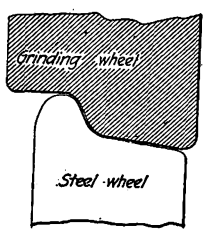
Cost of Welding Wire	
34-in. wheel	$0.51
26-in. wheel	.39
Average	$0.45
Cost of Electric Energy	
34-in. wheel, 23.1 kw.-hr. at 2.7 cents	$0.62
26-in. wheel, 16.5 kw.-hr. at 2.7 cents	.45
Average	$0.54

The total average costs without overhead are therefore as follows:

Welding labor	$1.55
Grinding labor	.98
Welding wire	.45
Energy	.54
Total	$3.52

This shows little saving, if any, over the cost of turning, using a modern type of lathe, with proper handling facilities and only one man. But it is in the increased life of the wheel that the greatest advantage comes from welding and grinding. The practice followed in Detroit has not been in effect long enough to permit the accumulation of comparative mileage figures, but an estimate can be made of the results to be expected. In addition, while the time of the welding operator is charged entirely against the wheel work in the figures above, he is available for miscellaneous welding jobs during the period that the automatic machine is in operation.

The standard flange in Detroit is 1 in. thick and $\frac{3}{4}$ in. high. On the basis of the A. E. R. E. A. standard limit-of-wear gage for this flange, it is necessary to remove approximately $\frac{7}{16}$ in. thickness of metal from the tread to restore the flange to its normal contour by turning, after it has reached the point indicated by the gage. Assuming that this occurs twice during the life of the wheel before it is scrapped, the wheels would have three periods of wear from the time they are first put into service until completely worn out. Starting with a tread thickness of $2\frac{1}{2}$ in. when new, and assuming that the wheels would be scrapped when the thickness is reduced to $\frac{1}{2}$ in., this would leave about 2 in. of effective metal in the tread. But of this amount, two turnings, each $\frac{7}{16}$ in. thick, are removed during the life of the wheel, to true up the contour of the tread and flange. Consequently, a total of $\frac{7}{8}$ in. of this metal finds its way into the shop scrap pile, and only about $1\frac{1}{8}$ in. of metal is actually worn off in service.



The Grinding Wheel Is Shaped so as to Finish Both Tread and Flange at Once

Assuming an average wheel life of 100,000 miles, this is obtained from the $1\frac{1}{8}$ in. of metal left to be actually worn off in service. This gives a mileage of slightly more than 11,000 for each $\frac{1}{8}$ in. of wear. If flanges are welded and ground, very little metal is taken off the tread to true up the wheel. Consequently a large part of the $\frac{7}{8}$ in. of metal which was formerly turned off is available for actual wear in service, and the wheel mileage may be reasonably expected to be increased in the same proportions as for the average mileage obtained. With 11,000 miles obtained for each $\frac{1}{8}$ in. of wear this would increase the mileage by 77,000 and would therefore add more than 75 per cent to the wheel life.

Mileage Is Increased

In addition to the saving made in the amount of metal taken off to true up the wheel, the practice of welding and grinding increases the mileage in another way. It is well known that when a wheel is turned the cut must be taken deep enough to remove the hard surface which has been rolled on the tread by contact with the rail. The practice of welding and grinding does not require the removal of this hard material and the life of the wheel is therefore increased beyond the amount that is indicated by the actual thickness of metal saved.

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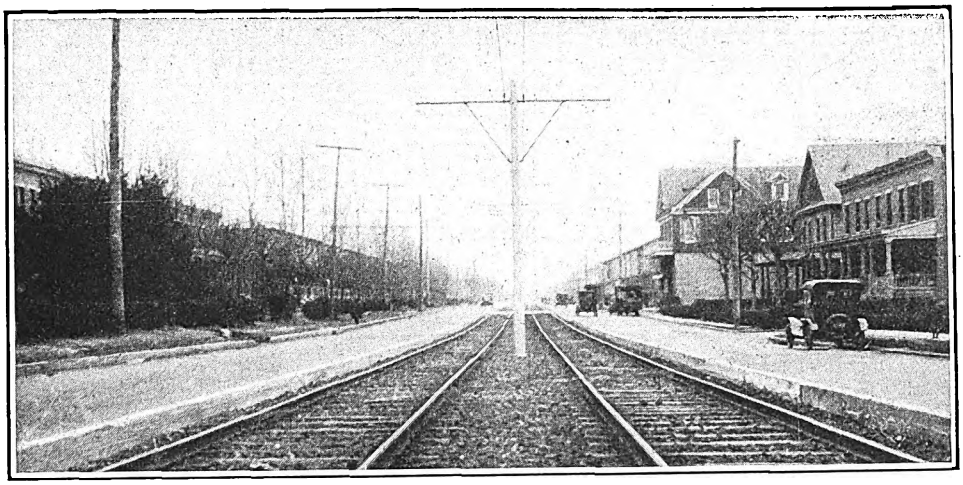

In the Suburbs a Portion of the Track Is in a Reserved Strip in the Center of the Street

Special Organization Handles Track Maintenance Work

United Railways & Electric Company of Baltimore Has Separate Forces for Maintaining and Rebuilding Track — Efficiency Is Promoted by Keeping Men Continuously Employed on Same Kind of Work—Maintenance Is Done on a Monthly Budget Plan

TO IMPROVE the efficiency of the men engaged in maintaining its track, the United Railways & Electric Company of Baltimore has developed separate organizations for doing this work and for rebuilding track. Replacements that are charged to capital or depreciation accounts are done by the reconstruction forces under the direction of the principal assistant engineer. All other track repairs are done by the maintenance of way forces under the roadmaster. Supervision over both organizations is exercised by the chief engineer. This arrangement is not inflexible, however. Men from the maintenance forces are engaged in reconstruction work from time to time and vice versa, but under normal conditions the two organizations function separately.

For maintenance of way purposes the system has been divided into four districts. The city of Baltimore is approximately square, and there is roughly the same amount of trackage in each of the four quarters. The east and west dividing line follows the general direction of Centre Street, while Charles Street is the north and south line separating the maintenance of way districts. Each district is further subdivided into a division and a section. The division comprises all the paved track in the district, while the seltion takes in all the open track. How nearly equal in mileage the various divisions and sections are is shown in the following table:

MILEAGE OF DIVISIONS AND SECTIONS

District	Paved Track	Open Track	Total
1. Northwest	56.07	46.59	102.66
2. Northeast	58.47	44.37	102.84
3. Southeast	50.75	45.20	95.95
4. Southwest	77.43	36.94	114.37
Total	242.72	173.10	415.82

A division foreman is in charge of all the work done on track in paved street in each district, and a section foreman looks after the open track. These eight foremen report to the roadmaster. As the work done in paved streets is more extensive and more complicated than that done on private right-of-way the position of division foreman is considered the more responsible and is ordinarily held by an older and more experienced man. Under the division and section foremen are gang foremen to direct the individual jobs.

The total maintenance-of-way force varies from about 300 to 400 men. Of these 30 are bridge carpenters, 30 are curve greasers, and 20 are track shopmen. There are also a few men engaged in miscellaneous occupations such as inspecting electric switches, renewing hard centers, etc. Trackwork usually can be done during 10 months of the year, but during the other 2 months the men are kept busy on emergency rail replacements, joint repairs, or snow fighting.

Maintenance work is done on a monthly budget basis, and the number of men varies somewhat according to the allowable expenditure for the month. In summer, or when particularly large undertakings require it, the force is increased. The men are hired by the gang foremen subject to the approval of the roadmaster. They must also pass examination by the company's doctor before they are allowed to go to work.

For track in paved streets the railway is now using A.E.R.E.A. standard 7-in. grooved girder rail, on wood ties, spaced on about 2-ft. centers. Six inches of stone ballast is machine tamped under the ties. Joints are installed by the electric seam-weld process. Where the remainder of the street is paved with asphalt, which is widely used in Baltimore, two rows of granite block liners are placed on each side of the rail. When granite block paving is used over the entire street the railway omits the liners alongside the rail.

Some track has been built using T-rail and nose block, but this is not thought to be very satisfactory.

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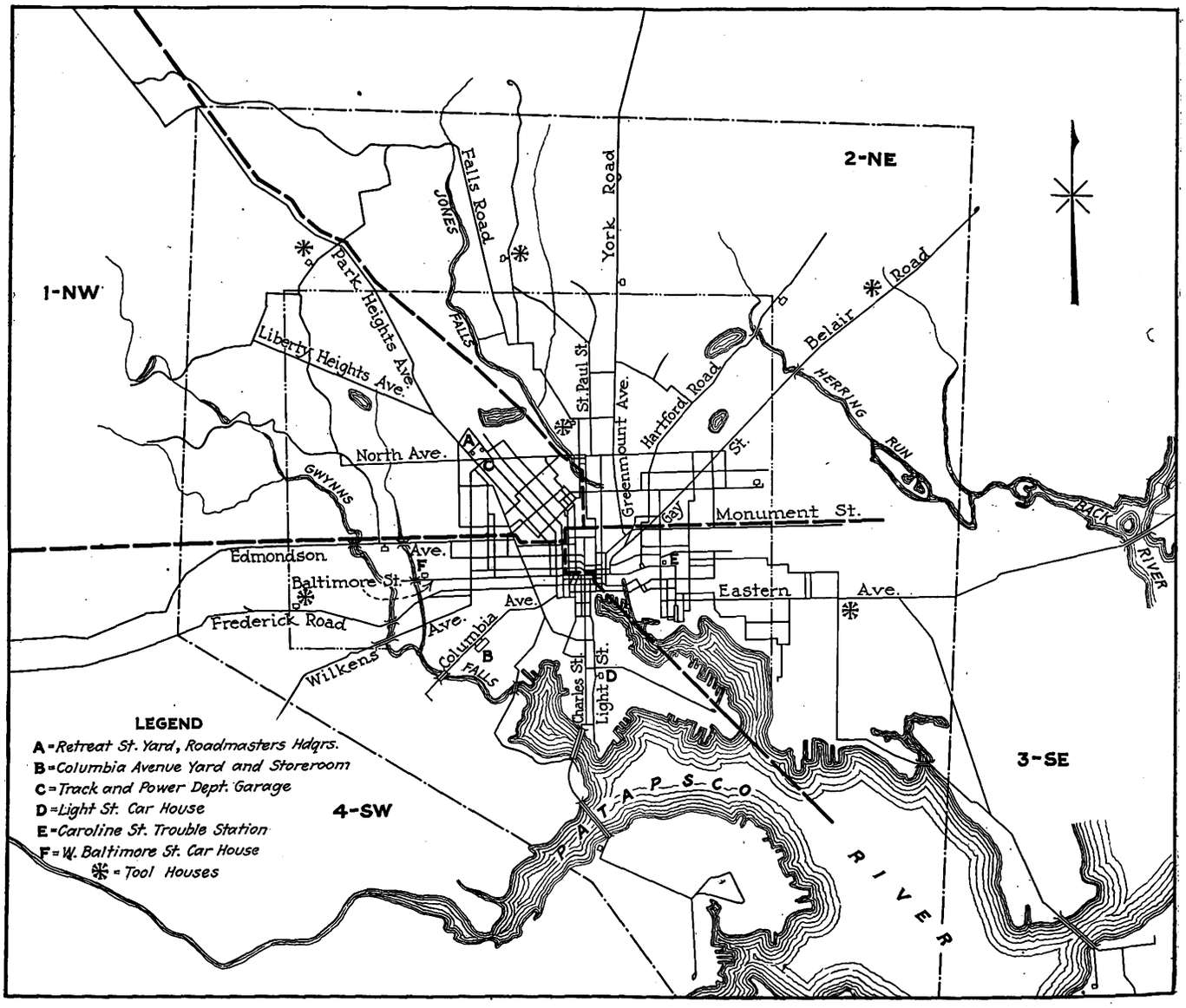
No economy has been effected by using such a method because the saving in the cost of rail is counterbalanced by the greater expense of the blocks.

Joints on all tracks in paved streets, with the exception of those in special work, are welded. The company has been using welded joints for many years, beginning with cast welds, later using electric bar welds, riveted joints with thermit welded bases and finally electric seam welds. Little trouble has been experienced with cupped joints except in track that is very old. When cups first appear they are ground out.



For Maintenance-of-Way Purposes the System of the United Railways & Electric Company of Baltimore Is Divided Into Four Districts with Approximately the Same Track Mileage in Each

As the age of the track increases and the cups become deeper they are built up with an electric arc welder and then ground smooth. Comparatively few joints, however, need to be treated in this manner because, as a general rule, by the time such a condition develops the track is practically worn out and ready for reconstruction.

Where track has worn until there remains only about 2 or 3 years of useful life, the rail begins to fail by breaking. This may be either at or near the joint or frequently remote from it. In such a case the defective part is cut out and a worn piece of rail of the same section installed. Ordinarily this piece of rail is at least 12 ft. long as it is felt that rails of shorter length are apt to work loose. In making repairs of this character bolted joints are generally used because the expense of welding would not be justified for the short time that the track is to remain. Moreover, where rail is worn to such an extent it is difficult to make a satisfactory job of welding. Having granite block liners along the rail makes it possible to cut out defective pieces of rail and install new pieces without disturbing the asphalt.

A careful record is kept of the exact time when paving is opened up and when it is closed again. It has been found that damaged claims for injuries incurred by people falling into the excavation have sometimes been presented long after a job was completed, so that these records have been helpful in furnishing details concerning the work in such cases. When the paving is opened up at night kerosene torches are placed down in the hole along the rail. These burn all night and illuminate the track area without interfering in any way with the passage of cars.

In the outlying sections of the city some of the track is in a reserved strip in the center of the street. At the time the railway lines in the suburbs were first built they were located alongside unpaved roads. When the city grew and these streets were improved it was

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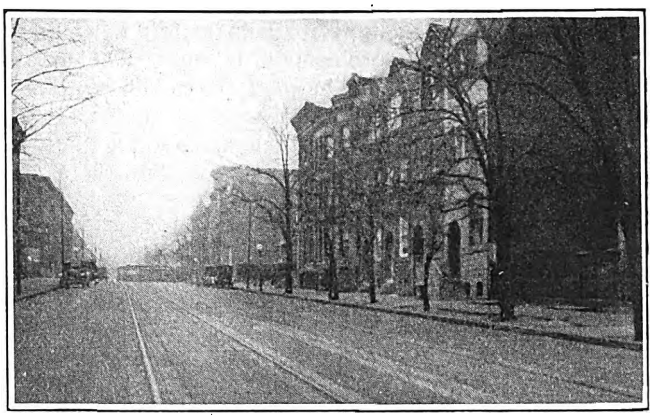
desired to have the tracks in the center. The company agreed to this change in location, provided that a strip was reserved for its use.

The width of the reserved strip varies somewhat with the width of the street, the minimum being 23 ft. and the maximum 26 ft. Wood ties and 85-lb. standard T-rail with bolted joints is the standard type of construction used. Its appearance is shown in an accompanying illustration. The overhead construction is carried on concrete poles, and concrete curbs separate the reserved strip from the vehicular roadways. No grass is planted in the reservation. In some locations hedges have been planted along the outer edges, but this practice is not favored by the railway. Experience has shown that there is a greater tendency for litter to accumulate in track planted in that way, and the appearance is marred rather then enhanced by the hedges. Maintenance work on track in the reserved strip is under direction of the section foremen.

Welded track, of course, needs no bonding, but through special work and the open T-rail track, copper bonds are used. They are welded in place by the acetylene torch method. In addition to bonding the joints through special work heavy copper cables are used for bonding around the entire job so that the return circuit is not dependent upon the special work.

Transportation of materials for the maintenance of way department is furnished by 11 White trucks and such work cars as may be needed. Each division has a 2-ton truck and each section a ¾-ton truck. In addition to these there is a 2-ton truck to carry the equipment used in renewing frog inserts, and another for repair work on drains and culverts. A ¾-ton truck is employed during the day to take care of electric switches. At 5:30 p.m. this truck reports to the roadmaster's office, and is kept there during the night to answer emergency calls.

All trucks are equipped with service recorders. Charts from these instruments are filed in the office of the roadmaster and from them it is possible to determine whether the trucks are being used to best advantage, that is, how much of the time they are in motion and how much time is spent waiting. The railway believes that these devices have saved their cost several times over.

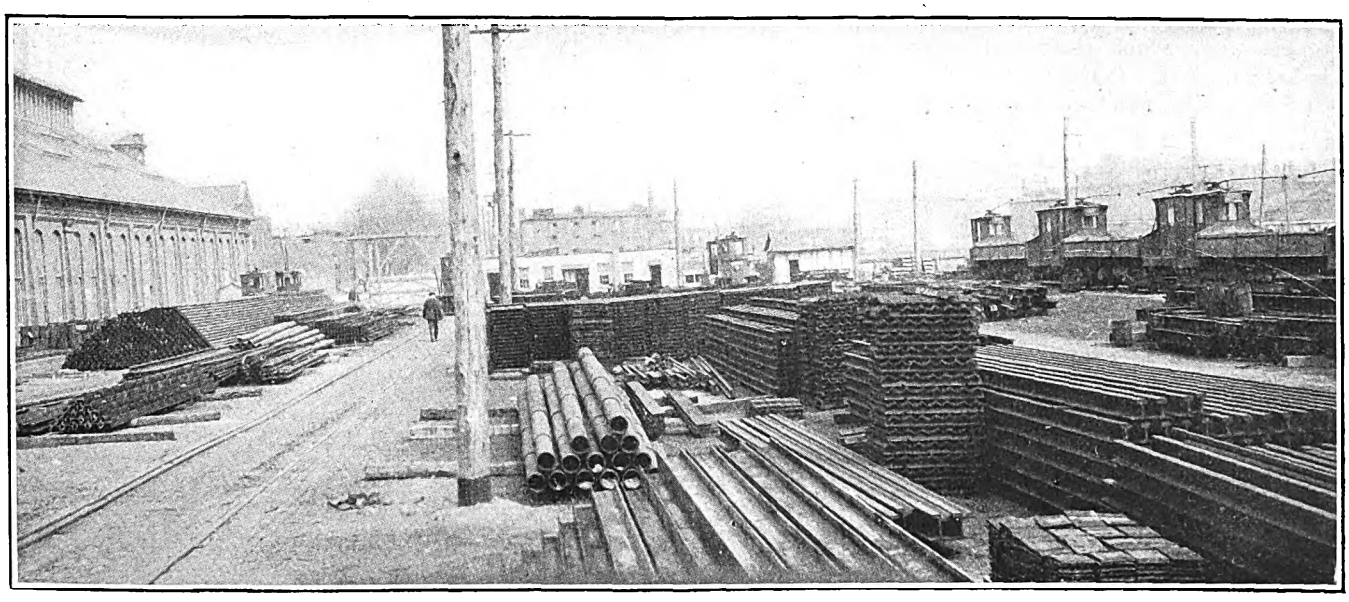


Two Rows of Granite Block Liners Along Each Rail Facilitate the Making of Minor Repairs

Each division and section has two sets of edge tools. One set is kept in a conveniently located tool house, and the other set, newly sharpened, is kept at the general track maintenance headquarters. Small tool houses, 10 ft. x 15 ft., have been built of corrugated iron and placed at spots readily accessible for the work on the outlying lines. Tools are transported back and forth between these locations and the yard by motor truck to reduce to a minimum the carrying of tools on passenger cars. For work in the center of the city the tools are carried and kept in the 2-ton divisional trucks.

Material for track maintenance work is transported by these motor trucks when the quantity required is small. Large lots and heavy materials are carried on work cars. These are under the direction of the superintendent of work cars, who has his office at the general storage yard. Crews to operate work cars and men to handle heavy material at the storage yard are under the jurisdiction of the track department, even though the material itself is controlled by the storekeeper until requisitioned. Comfortable quarters and recreational facilities have been provided for the yard men.

Although their territory spreads over more than 400 miles of track the division and section foremen keep in close touch with maintenance headquarters. Wherever he may be, each man telephones in to the roadmaster's office at 9 a.m., 11 a.m., 1 p.m. and 3 p.m. At 4 o'clock these eight foremen, together with the



Good Housekeeping Is Emphasized at the Main Columbia Avenue Storage Yard

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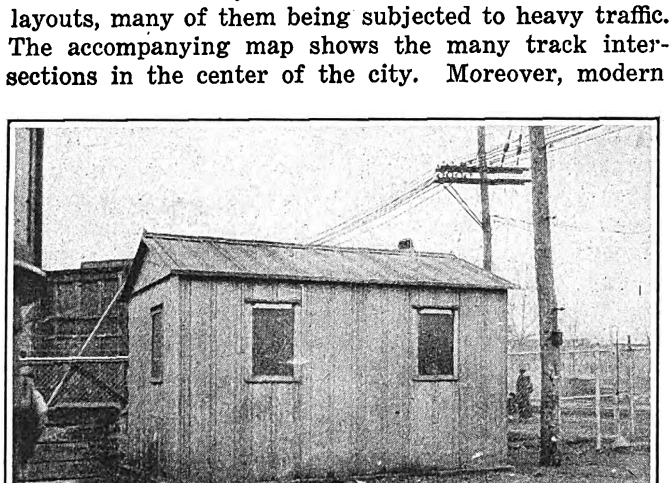
roadmaster and assistant roadmaster, sit down in the office and discuss the problems of the day. The quantity of material that will be needed the following day on each division and section is reported by the foreman in charge. Arrangements are then made for securing it from the storekeeper and transporting it to the desired location.

At this time the roadmaster calls attention to any reports that have been received concerning defective track or paving. All employees are encouraged to make report of anything of that kind that they find. Very often the maintenance department is already aware of the defect, but the co-operation of the trainmen has been found helpful in many cases. A special effort is made to repair as quickly as possible any defect reported in this way.

A serious maintenance-of-way problem is presented by the large amount of special trackwork in Baltimore. The United Railways & Electric Company has 826 such layouts, many of them being subjected to heavy traffic. The accompanying map shows the many track intersections in the center of the city. Moreover, modern



Tool Houses of This Type Have Been Erected in Convenient Locations to Save Carrying Maintenance Tools Long Distances

rolling stock will not clear on some of the old curves and the railway is installing clearance curves as fast as it is practicable to do so.

One gang which reports directly to the roadmaster is known as the "hard center" gang. It is engaged in tightening up, resetting and renewing frog inserts. A truck has been provided, as mentioned in a foregoing paragraph, to haul tools and materials for this work. Worn special work is built up by welding with an Indianapolis welder and grinder.

It has been found that where steel wheels are operated over manganese switch tongues there is a tendency for the sharp edges of the tongue to bite into the comparatively soft steel of the wheels, thus causing them to climb. The company's specifications require that the edges of new tongues shall be rounded off, but the tendency is for them to wear sharp again. A special gang of two or three men is employed to keep switches in good order and as the tongues develop sharp edges they are rounded off by grinding or hammering.

At the track yard the company has its own special-work manufacturing plant. This is a well-equipped shop capable of turning out any work that may be needed. Advantages claimed for this practice are that the work can be done at somewhat less cost than to buy it outside, and that it can be done much quicker. This reduces the number of parts that it is necessary to carry in stock. Hard center frogs can be made in 48 hours and built-up frogs in 10 hours, if necessary.

Overhead Railway with Chain Hoists Serves the Special Work Shop and Yard

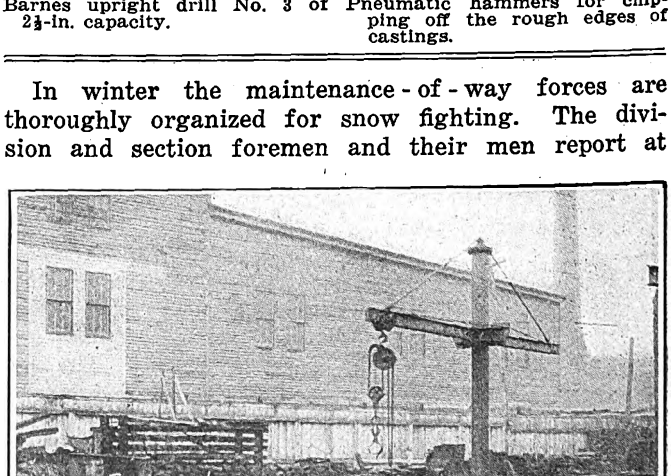
This plant supplies only a part of the railway's special work requirements. It is operated continuously throughout the year with a force of from 15 to 20 men. When the demand exceeds the capacity of the plant special work is purchased outside. No attempt is made to increase the output by employing additional men.

Compromise and ordinary joint plates are made at this shop. Rails are cut to whatever length needed for a particular job, and any necessary bolt holes are drilled. Maintenance tools are resharpened.

The machinery used for this work includes one each of the following:

- Hilles & Jones No. 4 rail bender capable of handling any sized rail.
- Hilles & Jones No. 3 punch and shears, which will punch a 2-in. hole in 1¼-in. steel.
- Highley cold-cut saw No. 20.
- Highley circular saw sharpener.
- Barnes upright drill No. 3 of 2¼-in. capacity.
- Detrick & Harvey open-side frog and switch planer, which makes a 15-ft. cut.
- Detrick & Harvey bolt cutter.
- Norton No. 7 emery grinder.
- Pennsylvania air compressor.
- Three Springfield swing grinders.
- Pneumatic hammers for chipping off the rough edges of castings.

In winter the maintenance-of-way forces are thoroughly organized for snow fighting. The division and section foremen and their men report at



An Upright Crane with a Chain Hoist at the End of a Horizontal Arm Is Used for Loading Materials in the Special Work Yard

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what are called "storm quarters," in most cases operating carhouses. These locations are shown on the accompanying map. The curve greasers are put to work cleaning switches in the center of the city when the snow reaches a depth of 1 in. The rest of the switches are handled by division and section foremen with 67 of their men. When snow reaches a depth of 3 in. the supervisor of reconstruction reports to the roadmaster's office with his own force of approximately 100 men. With this organization to back up the transportation department, the lines have all been kept open except under extremely bad storm conditions.

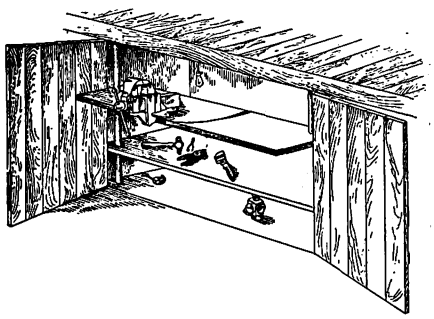
Special efforts are made by the maintenance department in summer to improve the appearance of the grounds surrounding carhouses and terminals. Much work has been done in planting grass and bushes in such locations and the appearance has been greatly improved.

Pit Tool Boxes Reduce Time of Bus Repairs

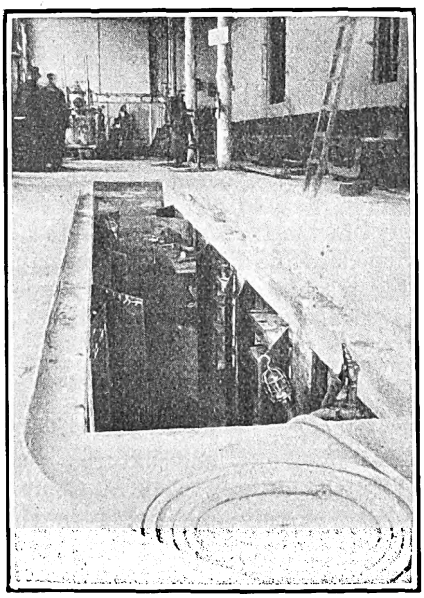
Cabinets in Sides of Pit Developed by Des Moines City Railway Contain Tools, Spare Parts and Supplies Required for Bus Maintenance

TO REDUCE lost time and save many extra steps taken between the pit and work bench in the routine maintenance of bus equipment, the Des Moines City Railway constructed the completely equipped inspection and maintenance pit shown in the accompanying illustration. This pit is provided with storage cabinets for tools, supplies and spare parts, a folding work bench and vise, and other facilities for doing work under the bus chassis.

A location was selected at one side of the car repair shop, where a convenient driveway is available for moving buses in and out of the shop. Practically all bus inspection and repair work is done here. This includes inspection and care of batteries and tires, changing of lubricating oil, etc.



By Means of a Folding Bench Equipped with a 4-In. Machinist's Vise Minor Repairs Can Be Made Without Leaving the Pit



In the Des Moines City Railway Shops the Repair and Inspection Pit Is Completely Equipped with Tools, Spare Parts and Supplies

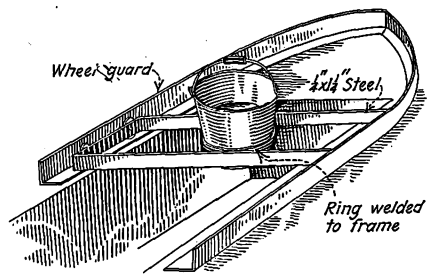
The length of the pit is 24 ft. 6 in. at the bottom, and 29 ft. at the top. It is 3 ft. 2 in. wide. At one end the depth is 4 ft. 6 in. and at the other end is 4 ft. 4 in., thus providing for drainage. Five storage cabinets 4 ft. wide and 2 ft. deep are formed in the concrete walls on each side of the pit. They are closed by swinging steel doors.

To form a guide for the bus wheels a 6-in. x 4-in. angle extends around the front and sides of the pit. The horizontal leg of this angle is turned toward the pit. This not only serves for fastening the frame in place, but also forms a secure reinforcement near the edge of the floor to support a jack at any point around a bus. The horizontal leg on the pit guard also serves as a track for the bucket carrier shown in another illustration.

Included among the tools and supplies stored in the cabinets are hand tools, special tools and extra parts that are most frequently needed. In one cabinet, a folding bench is arranged so that it can be swung out into a convenient position when needed and can be folded back out of the way when not in use. This bench carries a 4-in. machinist's vise which is suitable for supporting parts while adjustments or minor repairs are being made.

Tire chains, distilled water and battery acid, a large grease gun, a supply of transmission and engine oil and a vulcanizing outfit for making tire repairs are all conveniently stored in the pit. A CP-27 car compressor supplies air at 125 lb. pressure. The air hose is long enough to reach to the extreme end of the pit. Spare tires and tubes, extra battery parts and a battery tester are also included in the pit equipment. Battery charging wires are arranged so that when a bus is going to be out of service for some time, they can be connected to the bus battery without removing this from the vehicle. At one end of the pit an ordinary 12-in. electric fan is mounted so that this "pit workshop" can be kept free of fumes and provided with circulating air in warm weather.

A bucket carrier previously mentioned has proved to be an additional convenience. Ordinarily, when a bus is standing over a pit it is convenient for a workman to get at the drain plug for changing either transmission, differential or crankcase oil, but it is difficult to provide a suitable support for a pail which will not be in the way of a workman moving about the pit. The pail carrier consists of a light rectangular frame made of ¼-in. x 1¼-in. steel with a ring of the same material welded in the center. The frame is mounted on four rollers inside the wheel guard at the sides of the pit, thus permitting the carrier to be moved easily to any desired location under the bus. With the bucket supported as shown, the pit can be kept clean, and there is no obstacle to interfere with the workman when he is doing other tasks while waiting for the oil to drain out.



A Bucket Can Be Supported Close Under the Engine or Transmission When Draining Oil by This Apparatus

This convenient pit and its equipment were developed by A. J. Clements, mechanic in charge of bus maintenance, under the direction of C. R. McMahon, master mechanic.

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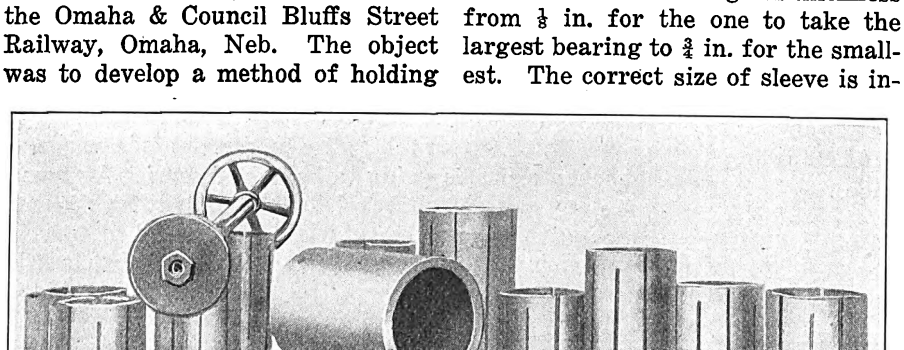
Equipment Maintenance Notes

Self-Centering Chuck for Armature Bearings

BY T. E. WOOD
Master Mechanic Omaha & Council Bluffs Street Railway

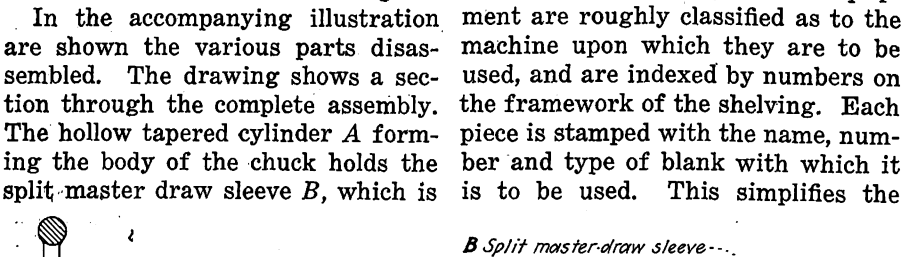
A SELF-CENTERING chuck for holding armature bearings while they are being machined has been designed and built in the shops of the Omaha & Council Bluffs Street Railway, Omaha, Neb. The object was to develop a method of holding the bearings securely in place in the lathe, while at the same time making it possible to center them accurately and quickly, so as to reduce the cost of doing this work.



Parts of Self-Centering Armature Chuck of Omaha & Council Bluffs Street Railway. The Split Sleeves Shown Accommodate Bearings of Various Outside Diameters

The principal parts of the chuck consist of a hollow tapered cylinder which is threaded on the lathe live spindle like an ordinary chuck, a split master draw sleeve, a rod extending through the lathe live spindle, and a set of split sleeves to accommodate different sizes of bearings.

In the accompanying illustration are shown the various parts disassembled. The drawing shows a section through the complete assembly. The hollow tapered cylinder *A* forming the body of the chuck holds the split master draw sleeve *B*, which is pulled tight by the hand wheel *D* acting through the rod *C*, the other end of which is threaded into the closed end of the cylinder at *E*. This compresses the sleeve as it is drawn into the taper. Each draw sleeve has ten longitudinal ⅛-in. slots equally spaced, and running alternately to within ½ in. of alternate ends. The sleeves range in thickness from ⅛ in. for the one to take the largest bearing to ¾ in. for the smallest. The correct size of sleeve is inserted in the tapered cylinder to accommodate the diameter of bearing being machined. Both the cylinder and the sleeves are of cast iron.



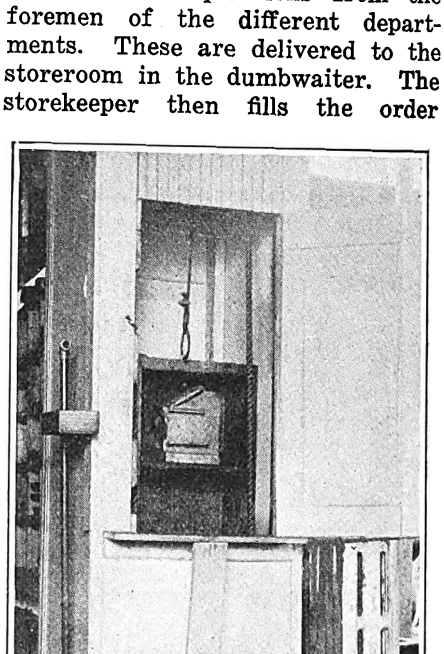
A Longitudinal Section Through the Assembled Chuck. The Bore of the Outside Cylinder Is Tapered so that the Split Sleeve Is Compressed as It Is Drawn Up into the Cylinders. The Rod C Extends Through the Lathe Live Spindle

Jigs and Dies Stored Systematically

ALL jigs, dies and fixtures used in the railway shop at Columbus are stored on shelving in the toolroom adjacent to the machine shop. The various pieces of equipment are roughly classified as to the machine upon which they are to be used, and are indexed by numbers on the framework of the shelving. Each piece is stamped with the name, number and type of blank with which it is to be used. This simplifies the task of finding a particular fixture, and makes it possible to send a machinist's helper to the toolroom.

Dumbwaiter Saves Time of Shopmen

THE storeroom for small maintenance parts used by the Eighth Avenue Railroad, New York City, at its 155th Street shop is on the second floor of the shop building. Ordinarily this is served by two stairways. Trouble caused the shopmen, and the resultant loss of time, from climbing the stairs has been overcome by C. P. Westlake, supervisor of equipment, through the installation of a dumbwaiter. The men obtain requisitions from the foremen of the different departments. These are delivered to the storeroom in the dumbwaiter. The storekeeper then fills the order quickly and lowers the dumbwaiter with the parts required. Movable shelves are provided to accommodate different sizes and varieties of material.



A Dumbwaiter Is Used by the Eighth Avenue Railroad for Quick Communication Between Storeroom and Maintenance Shop

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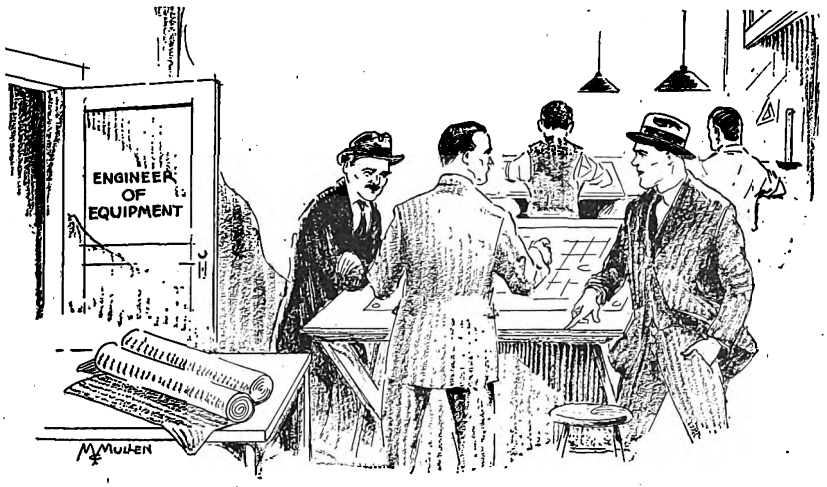
Dick Visits a Large Property

And Finds One of His Ideas in Practice



DICK PRESCOTT, engineer, and Steve White, carpenter foreman of the Consolidated Railway & Light Company, after completing their inspection at Centerville, arrived in Rushburg the following morning. As this was the largest city to be visited on their trip Dick felt that here, if anywhere, they would find concrete suggestions regarding the organization of an equipment engineering department.

Much to their delight, the engineer of equipment accompanied them on their trip through the shop. They lost no time in getting started.

As they entered the drafting room Dick brought up a subject in which he was particularly interested.

"What are you doing to standardize the various parts and fittings used on your different series of cars?"

"That's a very live topic with us," was the reply, "We started in about 2 years ago to see what we could do along that line and after we really understood what we were driving at, began to make pretty good headway."

"How do you go at it?" asked Dick.

"Come over here and I can give you quickly a rough idea of our method."

They moved over to a near-by table. He picked up a blueprint booklet and continued: "Now this set of prints makes up what we call a bill of material for a car. You'll notice that these forms contain a list of all the equipment on a given type of car, including detailed information that will assist in making out requisitions for the proper parts. Then we go on here (continuing to turn the pages) to a list of various castings, forgings and miscellaneous items with sketches of all these special parts. You'll notice pattern numbers for all castings are included. We have complete drawings of each of these patterns."

"That's very interesting," remarked Dick. "Now how do you apply this information?"

"Well, it's simply a process of elimination, once you have all the data in this form. By making very slight changes in design sometimes we are able to substitute one standard piece for several different varieties formerly in use."

"I follow you there, all right, but it looks like you'd still have to keep on ordering parts for the various cars in service, to have them all uniform in each car. Otherwise you'd have to scrap a lot of perfectly good material that is already on hand."

"That's true only to a certain extent. For instance, let's take this item of hand straps. We found that there were about 10 different types and lengths in our various groups of cars; in fact, just about as many different straps as there are types of cars. The store-room had to carry each type in stock for replacements, and at the same time the carhouses had to have some of each on hand. That meant that we were continually ordering small quantities of 10 different straps."

"When we studied this a little, we found that all our cars could be fitted with just two compromise types of straps. Then we made this sketch showing these two types, and a list of the cars in which each strap is to be used."

"What do you do when you have a car come in with one of the old straps broken?"

"I was just coming to that; it illustrates the principle of our entire practice. As soon as we had decided to use this new strap an engineering department instruction sheet was sent out to everyone interested, including storerooms, purchasing department and carhouses. Orders for replacement straps are limited to the new standard. When a car comes in with a broken strap, all those in that car are replaced with new ones. The old straps are put into stock and are used for replacements while they last. Then another car is stripped and the new standard is put in. So that way the process of substitution continues gradually, but all purchase orders are limited to the new standard part."

"That's fine," said Dick. "Will you let me have one of these blank bills of material forms?"

"Sure, help yourself. If you get into this subject, let me know if I can help you any further. Now if you'll come over this way we can see how it works out in the storeroom."

Car Maintenance Costs Reduced Since Last

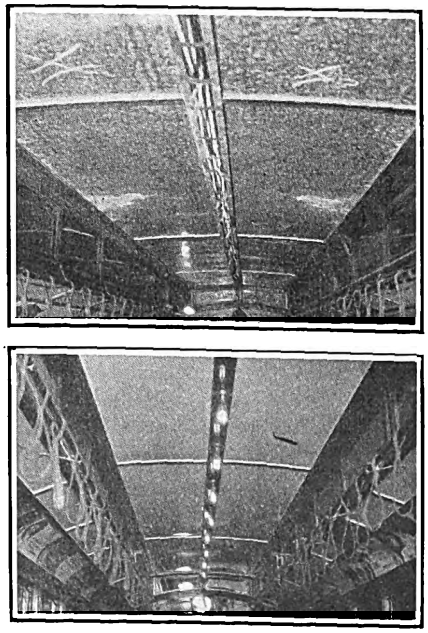
FIGURES compiled by the Electric Railway Association of Equipment Men, Southern Properties, showing the comparative cost of car maintenance in January, 1925, and the same month a year ago, indicate a reduction of nearly 1 cent per car-mile. Six companies reported lower costs in January of this year and three had greater costs. The average was 24 cents per mile as against 24.98 cents. Figures for individual railways are given in the accompanying table.

MAINTENANCE COSTS PER 1,000 CAR MILES

	Jan., 1924	Jan., 1925
Memphis	20.49	19.72
Little Rock	23.30	20.22
Atlanta	19.37	22.41
New Orleans	22.27	22.85
Knoxville	26.87	23.05
Dallas (Texas Elect.)	25.39	25.04
Dallas	30.42	25.09
Birmingham	23.10	26.60
Chattanooga	31.82	31.07
Mobile	26.80	....
Average	24.98	24.00

Galvanized-Iron Sheets Used for Headlining

WHENEVER the headlining in cars operated by the New York & Harlem Railroad, New York, N. Y., requires replacing, No. 20 gage galvanized-iron sheets are used. For the average size car each sheet that is used is 24 in. x 96 in. Artificial lighting is by a row of lamps down



Above, Ceiling of Car with Galvanized-Iron Headlining in Place. Below, Ceiling Completely Finished with Lamps in Place.

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the center of the car. The wires for the lighting circuits are inclosed in a trough and the bases for the lamps are mounted directly on the cover for this trough. Galvanized iron is used for the headlining as it has been found that it gives additional protection against deterioration.

Before the sheets are placed in position they are given a coat of Pratt & Lambert red primer on the upper side, and when they are in place the lower side is painted by a coat of red primer followed by a coat of Pratt & Lambert white enamel. This gives a smooth white surface which is a good reflector for the lighting. The accompanying illustrations show the galvanized-iron headlining in place and after it has been finished.

Cheap Concrete Setting for Poles

Old Paving Stones, Broken Concrete and Brick with Cement Grout Give Good Results in San Francisco

BY S. L. FOSTER
Chief Electrician Market Street Railway, San Francisco

UPON looking over an impressive list of 80 booklets relative to the various uses of portland cement recently, I was surprised to find no mention of the unusual use the Market Street Railway of San Francisco has made of cement in constructing the monolithic setting of its many thousands of steel and concrete poles for the past 23 years.

When a steel pole is set, it is raised or hoisted into the center of the hole dug in the ground. While it is held by pike—or fork—in the exact position desired, most companies pour and tamp concrete around the pole, this concrete being prepared manually or mechanically of the classical ingredients, namely, water, cement, sand and crushed rock or gravel and transported more or less from the point of mixing to the hole.

METHOD DISCOVERED ACCIDENTALLY

Owing to the non-arrival promptly of the crushed rock on a certain piece of pole setting work in 1902, the foreman of a gang doing this work on the Market Street Railway adopted an innovation that has since become our standard practice. From a near-by pile of rejected basalt or granite paving blocks he selected clean ones and packed the space tightly with these blocks between the pole and the sides of the hole. Then he mixed "grout"—cement, sand and water—in a large wheelbarrow at the edge of the hole and pouring it into the hole filled the interstices between the paving blocks, pole and sides of the hole with this "grout."

From that day to this no more premixed concrete has ever been used in our steel pole settings. Many of these settings have later been purposely demolished for various reasons, and invariably the exterior surface of the steel pole has been found perfectly preserved from corrosion and the cementing bond between paving blocks entirely satisfactory.

The proportions used in this "grout" has been one sack of cement to three sacks of sand and enough water to make it flow readily into the voids. No tamping is or could be done with this unfortunately but necessarily thin "soup." I know of no other electric railway company following our method of steel pole setting.

This method is as satisfactory as any other in furnishing the two objects of such a setting, namely, (1) providing a monolith about the lower part of the pole to present a broad surface over which to distribute the pressures against the soil produced by the leverages from the various strains applied to the top of the pole in railway work, and (2) inhibiting corrosion of the underground exterior surface of the steel pole.

It is economical of labor, as the throwing in of the paving blocks is simplicity itself while the stirring up of the "grout" in the wheelbarrow is done far more expeditiously than would be the case with the usual concrete mixture on a platform or in a concrete mixer. It is done exactly at the mouth of the hole, and the mixture is delivered into the hole the instant the proper consistency has been attained without any setting, any haulage cost, any tamping, any waste of cement or sand or any subsequent cleaning up of the street being required.

It is economical of material, as these old paving blocks, as used in San Francisco where blocks are continually being replaced by smoother paving, cost nothing beyond haulage and often are at hand when new track and pole construction are being carried on simultaneously. In other cases, instead of old paving blocks pieces of the excavated concrete base under bituminous paving, as removed by the track men to make room for ties and rails, have been used to fill the pole hole. This method saves not only the cost of the crushed rock but also the hauling cost of the crushed rock to the poles and the hauling costs of the condemned paving blocks or surplus concrete pavement base away from the street. After the great fire of 1906 bricks from the ruins were used with equally good results.

There is a still further advantage to this method of pole setting. As soon as the space between the pole and the sides of the hole has been packed full of the paving blocks or pieces of concrete pavement base, the pole is so firmly wedged in that the supporting pikes can be removed and usually the wire strains, if any, can be at once applied to the top of the pole. The pole is now practically set as far as resistance to the normal strains is concerned. The addition of the cement grout is really more to preserve the surface of the steel from corrosion than to provide rigidity for the setting, but this consideration should not lead one to use a cheap grout for the purpose. Poles have been found badly rusted where the proportion of cement had been abnormally reduced in the concrete used.

LABOR AND MATERIAL REDUCED

In brief, this San Francisco method improves the efficiency of steel pole setting in three essential features. It reduces the labor cost and the material cost, and it eliminates the former delay imposed on the linemen to permit the concrete to harden where the usual small-sized crushed rock is used instead of large paving blocks. Thus it expedites the work very materially.

As soon as the pole settings are grouted the span wires can be put up preparatory to stringing the trolley wire.

It is also found much easier to cut the pole setting off the pole with pneumatic chisels when paving blocks are used in the setting than when smaller pieces of stone are used.

Another favorable feature of this class of work in San Francisco by the ocean is that in the majority of holes clean sand is found entirely suitable for use with the cement. Thus the only transportation required for the concrete pole settings is that of cement and tools.

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Cleaning Armature Cores by Sand Blast

IN THE shops of the Department of Street Railways, Detroit, Mich., a sand-blast method is used for cleaning armature cores and commutators before rewinding. This method takes but half an hour to clean an average size armature as against half a day previously required for a man to scrape, file and

Cleaning a Railway Armature by Sand Blast Previous to Rewinding

pick it clean. The sand blast is directed against the parts by means of a nozzle attached to a flexible hose, with an air supply and valve convenient to the operator for regulation. A suction hood takes the dirt and refuse from the armature out of the shop.

Causes for Lubrication Failure

RECOMMENDATIONS for packing bearings, together with causes for failure of lubrication in service, are given in a discussion of lubrication practices recommended for electric cars, which appears in the January issue of *Lubrication*, a publication of the Texas Oil Company. Armature bearings must be carefully machined and fitted on all surfaces. It is essential that they receive a sufficient and continuous supply of satisfactory lubricant and that they be packed and fitted in such a manner as to exclude dirt and water. Assuming that a high grade oil and proper waste saturation are used, the principal causes of apparent lubrication failure are enumerated as follows:

1. Shifting of the bearings in the housing, caused by the shearing of dowels or keys. This prevents the window in the bearing from registering with the window in the waste well, thereby shutting off the oil feed.

2. Distorted bearings which are caused by a fit too tight in the bearing housing. To guard against this, the overhauler should be sure that the armature can be turned by hand after assembling.

3. Loose or stretched housing bolts in motors of the split-frame type cause a bad fit between the bearing and the housing and permit the oil to escape outside the bearing. Shims for the purpose of taking up wear have the same effect. Their use should be avoided.

4. Improper alignment in reboring housings and bearings often causes tight fits and leads to failure. End play should be checked and particular attention given to keeping water out of the lubrication chambers, as this washes out the oil and causes glazing of the waste.

Experience has shown that within economical limits the wear is approximately inversely proportional to the quantity of oil applied. Dirt and water can be kept out of the bearings by proper maintenance of the dust caps and waste box covers.

Axle bearing wear is not generally considered so harmful as armature bearing wear, but it is the cause of many troubles. Excessive axle bearing clearances cause shocks and unnecessary strains in the motor frame, and on the axle cap and axle cap bolts. A change in the center to center clearances between the axle and the armature shaft causes the gears to spread beyond the normal pitch line and causes excessive wear of pinions and gears, due to a rubbing contact rather than rolling. Uneven wear of two axle bearings should not be tolerated.

Pull-Ins Reduced in Dallas

FOR the first time since the active campaign was started by the Dallas Railway to reduce pull-ins the number in one month was less than 100, the record for February showing but 91. Of these, 61 were chargeable to the shops and 30 to the transportation department.

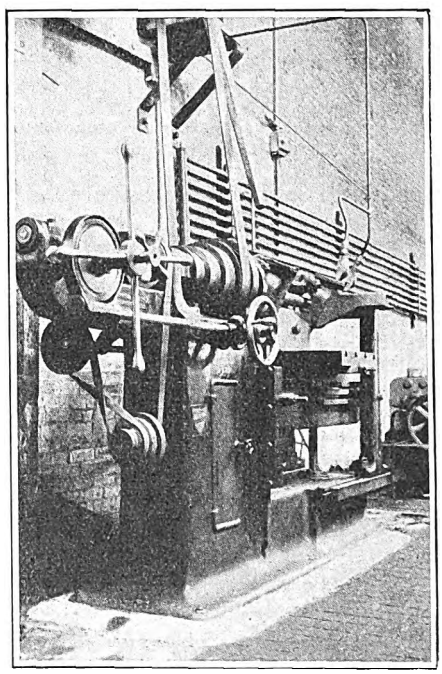
Mechanical pull-ins were: For fields, 31, armatures 10, brake rigging 9, air brakes and contactors 6 each, field jumpers 4, controllers 3, gearing, trolleys, brushes and holders 2 each, and for armature bands, bearings, motor leads, cables, circuit breakers, bells, seats, gates and journal boxes, 1 each. There were 5 unclassified.

Transportation pull-ins were: For accidents 14, unclassified 7, derailments and broken glass 3 each, found O. K. 2 and split switch 1.

Reconditioning Motors to Increase Bearing Mileage

RECENTLY the Eastern Massachusetts Street Railway made the first replacements of axle bearings on a group of small motors placed in service during the latter part of 1923. The average mileage per axle bearing was 125,000. In contrast to this the average life of axle bearings on several older type motors with shells more or less worn was found to be approximately 25,000 miles. In the case of the older motors, bearings had to be removed before they were fully worn on account of breakage, oblong dowel-pin holes, resulting from the loose condition of the bearings in the motor shell.

This convinced the company that in order to secure maximum bearing life the motors must be in first-class condition mechanically. As a result of a study of the subject a program of reconditioning motors by rebor-



Motors Are Rebored on This Machine in the Chelsea Shop of the Eastern Massachusetts Street Railway

ing is now under way at the company's Chelsea shops. It is expected by this procedure to triple the life of certain types of bearings.

One distinct advantage obtained by increasing the life of bearings is the fact that all bearing renewals can be made at the shops when cars are brought in for general overhauling, and thus eliminate the necessity of making replacements at the carhouses. One of the boring mills equipped with a special jig for re-

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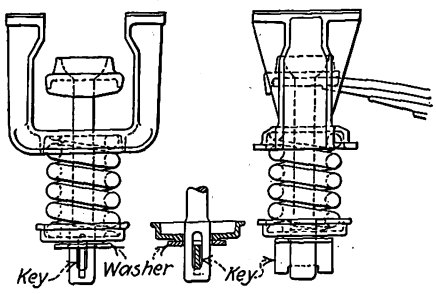
boring GE-247 motors is shown in the accompanying illustration.

In the case of this type motor the axle bearings were found to be too thin for satisfactory service. The diameter of the bearing is now being increased ⅛ in. with an allowance of 0.003 in. for clamping fit in the motor shells. To insure proper alignment each motor is fitted with a standard set of new armature frame heads before being placed in the jig. The motors are bored to provide interchangeability of the axle caps as heretofore. Direct labor cost of reboring the axle fits is $2.50 per motor, the work being done at the time the motors are overhauled.

New Equipment Available

Improved Swing Link

THE J. G. Brill Company, Philadelphia, Pa., calls attention to a new type of half-ball swing link that it has designed for suspending Birney safety car bodies from the



Changed Type of Swing Link for Safety Car Trucks

end quarter-elliptic springs of Brill 78-M and 79-E trucks.

This link forging is of the plain type and, instead of the threaded end with nut under the coil spring seat, a slot and key are used. This eliminates any difficulty which might occur from the nut rusting practically solid on the threaded link.

Limit Switch for Motor-Operated Shop Doors

A LIMIT switch has been designed by the General Electric Company, Schenectady, N. Y., for use with motor-operated doors and ventilator-opening equipment such as is used in many electric railway shops. The switch operates on the traveling nut principle, opening a circuit in either direction of travel, the distance of travel being regulated by means of an adjusting screw permitting calibration of from two to twelve turns.

Damage to the switch resulting from overtravel of the motor is prevented by allowing the traveling nut to leave the worm at the extreme ends, in which position further turning of the worm has no effect on the nut. When the direction of rotation of this worm is changed the nut is automatically re-engaged by means of a compression spring.

The switch is completely inclosed and the cover is held in place by four thumbscrews. Knockout holes are provided on the side for conduit wiring. The coupling is cup-shaped and slotted to engage a pin on the operating mechanism.

Due to the slow break of the contacts, the switch has been limited to 230 volts direct current, but can be used on 550 volts alternating current. The current-breaking capacity of the tip is limited to the current taken by the coil of a 75-amp. contactor on alternating current and an 80-amp. contactor on direct current.

Welding Flux Gives Strong Ductile Weld

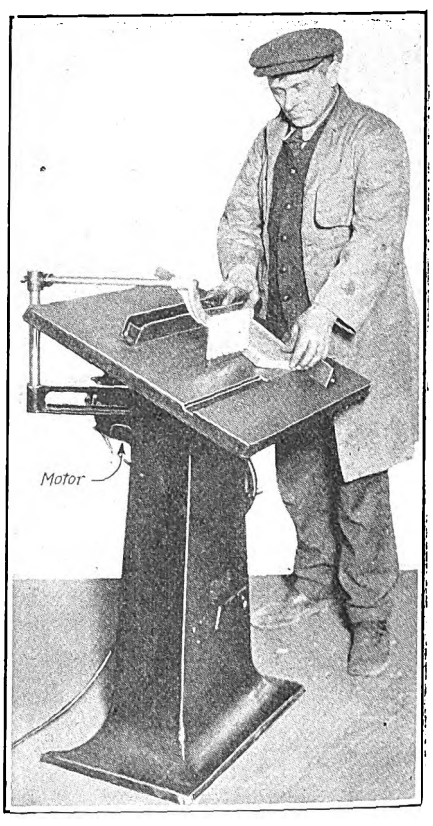
A WELDING flux known under the trade name of Welfex has been brought out by the Chemical Treatment Company, New York, N. Y. The manufacturer claims that this flux possesses several properties desirable for effecting a strong, soft and ductile weld which can be machined, faced or drilled without chatter or change of speed. The flux is intended primarily for gas welding. When using it, one end of the welding rod is heated by the torch flame and when brought to a cherry red is dipped in the flux, which fuses and forms a coating over the rod. The heat of the torch then causes the flux to flow from the rod to the weld. The end of the rod and the welding area should be kept well covered with this coating of slag.

It is stated that the slag which is produced not only protects but absorbs the impurities from the exposed surface of the hot metal, and that it also prevents serious changes of silicon or carbon content in the metal. Welfex is a desulphurizer, the affinity of its slag for sulphur being greater than that of the fused or molten metal.

Where welding is done on heavy pieces, additional flux should be added directly to the surface of the weld. With this method, care should be exercised to have the flux form a fluid slag of sufficient quantity to float over and completely cover the metal under fusion. This is essential, as the important service rendered by a fluxing slag is to dissolve metallic oxides and shield the molten metal from oxidation.

Universal Saw with Gear Drive

A UNIVERSAL saw, motor-driven through helical gears, is being marketed by R. L. Barker & Company, Chicago, Ill. The gears, which are exceptionally wide, are operated in oil. Ball bearings are used throughout. The driving equipment and the saw can be moved up



Universal Saw with Motor Drive

and down by turning a large hand wheel at the side of the machine. A heavy metal pedestal eliminates vibration and a guard for the saw is of efficient design. The table is 23 in. x 28 in. x 34 in. high and a saw 8 in. in diameter is used to provide a depth of cut of 2⅜ in. A ½-hp. motor is used for driving. The saw will cut wood, metals, bakelite and other compositions.

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Association News & Discussions

Steam Railroad Engineers Hold Annual Convention in Chicago

American Railway Engineering Association and Signal Section Discuss Many Committee Reports of Interest to Electric Railway Men—National Railway Appliance Association Stages Annual Exhibit

SUBSTANTIAL progress in the study and solution of various railway engineering problems was evidenced throughout the annual meeting of the American Railway Engineering Association, held in Chicago, March 10 to 13. Attendance equaled the high record figure of last year, and the dinner on Wednesday evening taxed the capacity of the Congress Hotel Gold Room. The largest display of railway engineering material and appliances ever assembled was staged during the period of the convention by 176 members of the National Railway Appliance Association.

President Ray Urges Greater Co-operation and Increased Committee Activity

In his annual address to the association, President George J. Ray, chief engineer Delaware, Lackawanna & Western Railroad, attributed much of the progress made by the association to conscientious and enthusiastic committee work. Speaking of the present status of the railway industry, he said that although the total business handled by the railroads in 1924 was not quite up to that of the peak year of 1923, the month of October, 1924, showed a greater tonnage handled than in any preceding month in the history of American railroads.

"This vast tonnage," he said, "was handled without any material shortage of cars or power in any part of the country. At the present time the railroads are passing through one of the most interesting stages of their existence. During the past year we have seen some of the first moves toward consolidation under the transportation act of 1920.

"We will have to help build up some of these new combinations to a point where they are capable of handling the business and to maintain them in an economical manner and safe condition. We will be called upon to adjust the usual construction and maintenance programs to fit the new requirements and conditions."

Referring to the problems of maintenance, he urged that budgets be based on the requirements of the traffic and operating conditions over a period of years; so that maintenance programs would not fluctuate with short periodic changes in volume of traffic. Mr. Ray summarized this by saying, "There should be a reasonable maintenance standard for every individual property. This standard should be based upon the general earning capacity and also upon the kind and class of traffic handled. With this standard correctly fixed, slight fluctuations in the business should not materially alter the yearly program of maintenance work."

On the subject of automatic train control he urged that railway construction, maintenance and operating men co-operate in studying and analyzing the various types of control that have been installed on several trunk lines during the past year in compliance with orders of the Interstate Commerce Commission. He also advocated that the railroads of the country take the initiative in collecting data to be used as the basis of eliminating unnecessary grade crossings.

At the meeting on Wednesday J. M. R. Fairbairn, chief engineer Canadian Pacific Railroad, was elected president for the ensuing year. Various committee reports presented during the session contain information of interest to electric railway engineers. These include the following:

Committee Reports of Interest to Electric Railways

Electricity.—The subjects covered were water power, electrolysis, transmission lines and the joint use of poles. Revisions were made in the specifications for the construction of overhead electric supply lines. Specifications were prepared covering the maintenance of transmission lines and the joint use of poles. These are designed for the guidance of forces engaged in maintaining railroad electric supply lines located on railroad property. Standard practices to be followed when wooden pole lines are used for both electric power transmission and distribution circuits, and for signal and communication circuits, are also compiled.

Ballast.— Specifications for stone ballast were presented with a recommendation that they be substituted for the present specifications in the manual. It was recommended that the design of the 15-tine ballast fork adopted in 1924 be withdrawn from the manual because this fork cannot be produced commercially. Investigation showed that the railroads do not favor different sizes of stone for different characters of traffic. It was also concluded that there is no particular advantage in smaller sized ballast from the standpoint of collecting dirt. Consequently it was decided to make ¾ in. the minimum and 2½ in. the maximum sizes for ballast. It was also concluded that rock meeting the requirements for weight, toughness, soundness, wear and cementing qualities would necessarily be satisfactory in strength, absorption and solubility, and these last-named tests were, therefore, omitted from the proposed specifications. No definite rules were offered on the subject of ballasting by contract, but the committee submitted as information a typical form of contract and specification which has been used successfully by one road.

Masonry.—Last year's unfinished report on the principles of design of plain and reinforced concrete for use in railway structures was completed. It was submitted with the recommendation that it be included in the manual. The report called attention to the lack of reliable information as to embankment pressures on culverts under deep fills and the committee therefore limited its study to vertical loads. Rules for the inspection of masonry structures were also included in the report.

Economics of Railway Location.—A progress report included methods of estimating speed, time and fuel consumption on lines to be constructed or revised. An outline of the computations for the speed curve method was given, together with a modification of this method, especially adapted to computing the values of rise and fall. It was pointed out in the report that speed should be differentiated as between that based on running time between stops and the speed based on the elapsed time between terminals. In view of the many variable contributing conditions, no definite method was given for estimating delays, except that of studying past performance under similar physical operating and traffic conditions.

Buildings.—The committee recommended that the specifications for concrete roofing tile, display roofing tile, electric light wiring, hot air heating, hot blast heating, architectural terra cotta and concrete architectural stone, as presented in the 1923 report, be approved for publication in the manual. The conclusions of the committee relative to floors for freight houses and location and design of passenger stations were submitted for inclusion in the manual. Data covering the ventilation of railway buildings were also presented as information.

Stresses in Railroad Tracks.—This committee submitted a progress report based on four years of study in co-operation with the American Society of Civil Engineers. The report gave further data on stresses in tracks produced by the action of steam and electric locomotives. It also included the

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first scientific study of the effects upon rail and upon track maintenance, resulting from the canting of rails inward. A general discussion was given of tests conducted on the Chicago, Milwaukee & St. Paul Railway.

Co-operation with Universities.—Stimulation of a greater interest and appreciation of the value of technically trained men in railway organizations was the purpose of this committee. Its further object was to secure a more general application of laboratory and other university research facilities to the solution of railway problems, and at the same time to stimulate a greater interest among engineering students in transportation as a future vocation. A progress report was submitted carrying on further the work done in previous years.

Economics of Railway Operation.—The report of this committee included an analysis of the effective speed upon the cost of transportation. It also presented further data on methods for increasing the traffic capacity of a railroad, and an analysis of costs as applied to starting and stopping trains.

Roadway.—Information reports were submitted on corrugated metal culverts, methods of handling the problems resulting from slides and water pockets, and methods of keeping down dust on road crossings and platforms as well as on tracks.

It was pointed out that when the roadbed shoulder is built up with clay or other impervious material, a pocket which holds water is formed under the track. It was recommended that cinders or some other porous material should be used to build up the roadbed shoulder instead of clay or other like material. When it becomes necessary to use impervious material, the committee stated that suitable cross-drains should be placed to prevent water pockets.

Spraying with crude oil was found to be the most general method used for the elimination of dust. It was also found, however, that several railroads have discontinued this practice. In some cases oiling of the roadbed was unsatisfactory for a number of different reasons. It seemed to be the general opinion that oiling of the roadbed is advisable in sandy desert regions where the rainfall is very light, but that the results are much less satisfactory in districts having a nominal amount of rainfall. There seemed to be a general agreement that station and freight yard driveways can be oiled to advantage and that the same is true of highways at crossings or points adjacent to railroad tracks.

Wood Preservation.—The committee on wood preservation reported under six heads. This included revision of the manual, service test records on ties and fence posts, treatment with a mixture of creosote and petroleum, treatment with a mixture of chloride of zinc and petroleum, marine oiling research and the effect of preservatives on the inflammability of wood.

Owing to the increased use of treated timber and the decreased quantities of creosote which are available, the question of the suitability of mixtures or combinations with other preservatives was considered particularly pertinent. The report continues the study of this subject from last year. For inclusion in the manual specifications were submitted covering thermometers used in creosote distillation and also a method for the analysis of zinc chloride.

During the past year a process was developed at the Mellon Institute of Industrial Research, Pittsburgh, Pa., by means of which zinc chloride and petroleum is injected into the timber in the form of an emulsion composed of zinc chloride solution of 15 to 40 per cent strength and a mixture of heavy asphaltic base petroleum thinned to the density desired. The results obtained from the zinc chloride petroleum treated ties indicated that the addition of the petroleum to zinc chloride will, under most conditions, add to the life as compared with zinc chloride treatment only. The report stated that experimental work along this line carried out during the past year has been very encouraging.

Shop and Locomotive Terminals.—Among several subjects studied by this committee was included the general layout and design of car shops. This was treated from the standpoint of steam equipment conditions, but allowance for the differences in clearance required would permit these recommendations to be readily compared with electric railway practice.

Signals and Interlocking.—The report of the committee on signals and interlocking contained voluminous information on automatic train control and signals for highway crossing protection. In treating automatic train control, the committee outlined six important phases of the subject but confined itself this year to a detailed report on but two of these, namely, (1) the purpose of train control and historical data; (2) the extent to which wayside signals may be omitted in train-controlled territory.

The several sections into which the complete report will be divided are as follows:

The purpose of train control and historical data.

Definitions.

The effect of train control on train operation.

The comparative control furnished by various types of train-stop and train-control devices.

The effect on signal systems of installing train control.

Extent to which wayside signals may be omitted in train-controlled territory.

Iron and Steel Structures.—A number of revisions of the manual dealing with the general specifications for steel railway bridges were prepared. Certain portions of the manual, nullified by the adoption of the general specifications for the erection of steel railway bridges, are to be removed. In addition, the report includes rules for the field inspection of existing bridges, a statement relative to the status of the specifications for steel highway bridges now before a conference committee of the American Railway Association, the American Society of Civil Engineers, and the Association of Highway Officers.

Uniform General Contract Form.—A form of option for the purchase of land and a form of agreement for the joint use of passenger station facilities were presented by the committee. There were also included in the report for information and discussion forms of agreement for the purchase of electrical energy, for the joint use of freight station facilities and for joint pole lines. The committee reported on the result of the joint conference on standard construction contracts to which its chairman was a delegate.

Yards and Terminals.—This year the committee has carried forward its detailed studies of the relation between passenger station facilities and business handled, to include an analysis of the problem of handling commuter traffic as contrasted with through traffic. In addition, a detailed report was submitted on the handling of freight, dealing particularly with the economics of various types of freight houses and involving both operating and investment charges. Curves were presented in the report showing the comparative investment per ton for outbound and inbound houses.

Ties.—Further study of substitute ties was covered by a section of the report dealing with the principal causes of failure of substitute ties and methods whereby these might be overcome. Suggested designs were submitted with the recommendation that interested roads build and test these types under different track conditions. Foreign woods for tie purposes were discussed and conclusions were submitted for inclusion in the manual. A specification for tie plugs was also prepared.

Economics of Railway Labor.—A discussion of standard methods for performing maintenance-of-way work and of methods of programming this work were included in the report. The first portion of this discussion deals with the establishment of standard schedules as units of performances for the purpose of securing the most effective organization of the maintenance forces. Such necessary factors as budgets, equalization of expenses, division programming and the relation of these factors to the economical application of labor are discussed in the second portion of the report.

Records and Accounts.—The work started last year on cost-keeping methods and statistical records for the purpose of securing unit costs was discussed in the report. Three different classifications were presented as a basis for separating the cost figures. These included studies of maintenance costs from the I.C.C. primary accounts, from sub-primary accounts and from special studies. The committee concluded that cost keeping and statistical records are practical and result in economies, by facilitating the control of expenditures.

Signs, Fences and Crossings.—This committee prepared definitions of bituminous materials and specifications for bituminous crossings, for approval and publication in the manual. It submitted a progress report on the elimination of highway grade crossings and also compiled information outlining the methods followed by the various states in apportioning the cost of highway improvements adjacent and parallel to railroad rights-of-way.

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Tracks.—An amended table of temperature expansions for laying rails, which gives values for 39-ft. and 45-ft. rail, was presented for revision of the manual. Detailed plans of certain types of crossings, compromise joints and compromise rail were submitted for adoption. The committee recommended the practice of canting rail inward at the rate of 1 in 20. Figures were prepared showing the comparative cost of resawing, rerolling and building up rail ends by the oxy-acetylene process. Data on track construction in city streets were included.

Rail.—This committee presented new specifications for rail in which the non-essential features heretofore causing dissension between rail manufacturers and railways have been eliminated. It also submitted a progress report for track bolts, and suggested a method of compiling statistics based on a traffic density factor.

Wooden Bridges.—A record of progress on the study of the useful strength of new, old and treated timber in railway trestles, and a critical examination of the present series of stresses when applied to timber under railway load conditions, were contained in the report. There was also a classification of the uses of timber and lumber under A.R.A. specifications. Attention was directed to the standardization program developed by the timber industry, resulting in the American Lumber Standard Recommendation No. 16 of the U. S. Department of Commerce. The committee also reported on the relative merits of open and ballasted deck timber trestles.

Central Electric Railway Association Master Mechanics Organize

New Association Will Be Affiliated With C. E. R. A.—Purpose Is to Consider Methods of Improving Equipment Maintenance Practice and to Work Toward Greater Uniformity as a Means of Expediting Interchange

EQUIPMENT men in the territory covered by the Central Electric Railway Association met at Lima, Ohio, on March 12 and organized the Central Electric Railway Master Mechanics' Association. This is the result of a movement started shortly after the last annual meeting of the C. E. R. A., at which time some of the equipment men felt that they would derive greater benefit from meetings devoted entirely to equipment subjects than from the procedure as followed in the Engineering Council. Approximately 30 equipment men attended this first formal meeting of the new association, and a special committee appointed by the executive committee of the C. E. R. A. sat in during part of the session, to outline the views of the executive committee relative to the new organization.

Need for Master Mechanics' Organization Outlined

T. H. Nicholl, superintendent of motive power Union Traction Company of Indiana, who presided as temporary chairman, opened the meeting by stating the need for some more closely knit organization of equipment men than had been offered by the engineering council. The object of this movement, according to Mr. Nicholl, was to make possible an intensive study of mutual equipment problems, to raise the standard of equipment maintenance on the member roads in the territory, and to expedite the interchange of equipment through greater uniformity of practice.

He pointed out that the best results from the standpoint of improvement in practice could be accomplished through the medium of an exclusively mechanical men's organization, rather than through the existing engineering council. This was held to be due primarily to two reasons; first, the saving in time resulting from confining the discussions to equipment subjects entirely, and second the simplified organization that would result from the elimination of the geographical subdivisions into which the engineering council was divided.

G. R. Green, general superintendent Chicago, South Bend & Northern Indiana Railway, made an impassioned appeal for a full recognition of the importance of the master mechanics' duties on electric railways in general and particularly those engaged in the interchange of equipment. He maintained that methods of improving the service to shippers should receive the utmost consideration by all departments of the various roads in the territory. He held that this would mean increased freight business, particularly in the C. E. R. A. district, and consequently considered it of vital importance to the very life of the industry.

Mr. Green spoke highly of the past work of the Engineering Council. From the equipment man's viewpoint, however, he said that the concrete results accomplished had been limited, due to the short time available for the consideration of track and overhead line subjects along with those of the mechanical department. Through a master mechanics' association the mechanical men had felt that they would have more time available to work out their specific problems. He maintained that the master mechanics are in position to make substantial savings in costs through comparison of practices and interchange of ideas for improvement. He suggested that by holding meetings at various points in the territory at least a part of the time available could be used to visit the shops of member companies, thus better to compare practices and take advantage of new methods and ideas.

The same line of thinking was expressed by E. B. Gunn, superintendent of equipment and transportation Western Ohio Traction Company, who had undertaken the work of sending out notices for this meeting. He said that it was the intention to make these strictly business meetings, and that attendance by representatives of manufacturers would be limited to those in position to assist directly in the work of the association. He added that it would be the practice to discourage entertainment of any kind, so that the time available for meetings could be used to the greatest possible advantage.

According to all three speakers, it was the desire and intention of the master mechanics to maintain a close affiliation with the C. E. R. A. They explained that the meeting in progress had been called for the purpose of working out a concrete plan which would then be submitted to the executive committee of the C. E. R. A. for approval before going ahead.

G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, representing the executive committee, said that it was inclined to commend the master mechanics for the initiative and enthusiasm which had led them to go ahead with plans for a better way of doing their work. He felt sure the executive committee would approve the proposed form of organization, affiliated with the C. E. R. A.

Brief addresses were also made by F. D. Carpenter, president Western Ohio Railway; M. Ackerman, general manager and purchasing agent Cincinnati & Dayton Traction Company, and K. A. Simmon, representing M. B. Lambert, Westinghouse Electric & Manufacturing Company. Some of these speakers expressed the thought that the interests of all concerned would be served best by making the master mechanics' organization one section of an engineering group which would include the maintenance of way and

RULES FOR INSPECTION OF INTERCHANGE EQUIPMENT

Wheels

A. Tread thickness measured 1 in. from edge of rim shall not be less than ¾ in.
B. No wheels must have over ⅛ in. hollow tread.
C. Flanges not less than 1⅛ in. thick.
D. Treads not to be over 3⅞ in. wide or under 3 in. at any point.
E. Must not have chipped flanges more than ⅞ in. wide by 1½ in. long.
F. Steel wheels must not have a flat spot over 2 in. long and cast-iron wheels must not have a flat spot over 1 in. long.
G. Wheels must not be less than 54 in. inside measurement at gage line.

Couplers

A. Knuckles must not be over 5¾ in. from face to contour of coupler.
B. Locking device must come within 2 in. of knuckles.
C. Minimum height 31½ in., maximum 34½ in. under any condition of loading.
D. Anchor must not be loose and no anchor bolts missing.
E. No cracks or defects on knuckles or drawbars or anchors.

Trucks

A. Side bearings to have at least ⅛ in. clearance under load.
B. Center bearings must be O. K. and well lubricated.

Brakes

A. Not over 8 in. piston travel under load.
B. Heads, beams, pins, rods, hangers, etc., must be in good repair.
C. Hand brake must be efficient and in good repair.

U. S. Safety Appliances Standard

A. All cars must be properly equipped with United States Safety Appliance Standards.

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power distribution men. The equipment men, however, felt that the others should take the initiative on their own account in forming themselves into similar groups.

A constitution which had been prepared by a special committee was read and adopted, and was then turned over to the secretary for submission to the C. E. R. A. executive committee. This provides for three grades of membership, namely, active, associate and honorary. Membership in the first grade, the only one permitted to vote and hold office, is limited to those in active charge of the maintenance of equipment on member roads of the C. E. R. A., and their principal assistants. Not more than two persons from any one property can hold active membership. Associate membership is open to mechanical department foremen, inspectors, etc. Honorary members are to be elected by the executive committee.

Rules for the inspection of interchange equipment were taken up, discussed in detail and adopted. These rules are published on page 477. An evening session was devoted to a detailed discussion of a code of rules governing the condition and repairs to freight cars for the interchange of traffic. This was designed as a guide for the adjustment of questions arising between car owner and handling road.

A special committee was appointed to prepare a schedule of uniform charges for the repair of equipment on foreign roads. Standing committees on standardization and on subjects were also appointed.

The following officers were elected to hold office until the next regular meeting: T. H. Nicholl, president; P. V. C. See, vice-president; L. E. Earlywine, secretary and treasurer; E. B. Gunn, F. J. Foote, Fred Heckler and J. W. Osborne, members of the executive committee.

The next meeting will be held at Fort Wayne, Ind., on April 9.

American Association News

Power Transmission and Distribution

THE midyear meeting of the power transmission and distribution committee was held in Chicago on March 9 and 10 with the following members present: Charles H. Jones, chairman; J. Walter Allen, J. C. Damon representing W. H. Bassett, M. W. Cooke, S. M. Day, J. H. Drew, D. D. Ewing, Charles Gilman, H. W. Griffin, C. L. Hancock, C. J. Hixson, W. E. Huber, Adrian Hughes, Jr., John Leisenring, F. McVittie H. S. Murphy, C. P. Nachod, J. F. Neild, W. J. Quinn, W. Schaake, A. Schlesinger, J. M. Waldron, F. J. White.

The Monday sessions were devoted exclusively to meetings of sub-committees. Considerable progress was made at these meetings in the compilation, preparation and discussion of reports on the various subjects assigned to them. The general meeting of the committee was held on Tuesday. In order to conserve the time it was decided to proceed with the business of receiving progress reports of the various sub-committees.

Mr. Waldron, chairman of the sub-committee on revision of signal sections of the manual, reported progress on the standardization of aspects for signaling.

For the sub-committee on concrete pole design Mr. McVittie, chairman, reported that three meetings had been held and a tentative report had been prepared which contemplates leaving out a considerable portion of the text matter in the present manual section. This committee has decided to conduct a series of tests on poles now in general use and will include the results of these tests in its final report.

It was planned to conduct all of these tests on octagonal poles, but Mr. Hughes kindly offered to conduct a similar series of tests on square poles. The same general rules and calculations that apply to octagonal poles also apply to the hexagonal and round poles and with the addition of the data accumulated from the square poles the report of this year's committee will undoubtedly be very complete on this subject. It was the opinion of the committee that the time was not ripe for the development of an A. E. S. C. standard as the concrete pole was largely in the development stages.

Mr. Murphy reported that a meeting of the sub-committee on trolley wire wear and specifications had been held in New York a few days previous with the corresponding sub-committee of the American Society for Testing Materials. A definite agreement was reached on the hard drawn trolley wire specifications. The specifications as prepared by the secretaries of the two organizations were modified to a small extent by the addition of paragraphs pertaining to the reeling of wire and the modification of the paragraph referring to the twist test. Mr. Jones stated that with approval of both associations these changes bring the A.E.R.E.A. specifications for hard drawn trolley wire into complete conformity with the A. S. T. M. specifications.

At the meeting in New York of the sub-committee of the two associations considerable progress was made in the development of a high strength trolley wire specification. It was agreed to set up two different strength specifications, one to be referred to as high strength bronze wire and the other to be referred to as medium strength bronze wire.

It was impossible to come to any agreement with the A. S. T. M. on the twist test for a high strength wire. After considerable discussion on this subject it was the opinion that unless the A. S. T. M. saw fit to alter the stand its sub-committee has taken a high strength specification should be developed by the power transmission and distribution committee.

Mr. Murphy stated that very little progress was being made on the question of current collecting devices, on which subject a corresponding committee of the equipment committee was also working. He also stated that some additional data had been gathered on the subject of trolley wire wear and it would be compiled in time for the inclusion of the report of the committee in June.

Mr. Neild submitted a definite report on temporary connections to trolley wire, which recommended the use of two devices, one of which had to be removed in order to permit a trolley car to pass, while the other one could be left on the wire while cars passed underneath it. This report was accepted for final submission to the committee in June.

Mr. McVittie stated that considerable discussion had taken place regarding specifications for trackless trolley overhead construction and that the committee now had before it a tentative set of specifications which outlines general construction details. Since comparatively few installations of trackless trolley were being made the committee did not feel that a very extensive and comprehensive set of specifications was required at this time.

Mr. Allen reported that the committee on return circuits had arrived at certain conclusions as to the number of bonds, types of bonding and place of attachment to the rail and that a report was in process.

Mr. Jones stated in the present specification for direct suspension overhead construction, which has been adopted by the A. E. S. C. as a tentative American standard, are a great many construction details which apply also to catenary suspension. It was his opinion that while it should be desirable to consolidate the specifications for both types of construction in the one specification it was not advisable to do that at this time. Mr. Jones suggested that it would be better to prepare a separate specification for catenary overhead and include in it those portions of direct suspension specification that were applicable. Such a specification will be ready for final discussion of this committee prior to the June meeting.

Since the organization meeting of the committee in December the executive committee has assigned the subject of radio interference for investigation. After some discussion a sub-committee consisting of W. J. Quinn and J. F. Neild was appointed.

As a result of a discussion on protcetive coatings for iron and steel it was agreed that the manufacturer representatives present, who were interested in galvanizing work, would gather together information relative to the various tests which might be used in determining the quality of galvanizing.

On March 5 and 6 a meeting of the A. E. S. C. sectional committee was held in New York on revision of parts two and four of the National Safety Code. The association was represented at this meeting by C. R. Harte, R. W. Eaton and M. B. Rosevear.

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The News of the Industry

Franchise Progress in Kansas City

New Grant Which Will Provide for Bus Service Ready to Go Before Council

At the meeting on March 9 of the committee of the Council of Kansas City, Mo., which has before it the ordinance to establish conditions under which the Kansas City Railways is to be allowed to operate buses in auxiliary service, a further delay of one week was arranged before the final draft of the ordinance is placed before the entire Council for a vote. It is six months since the railway first applied for permission to run buses in service auxiliary to the railway.

At the outset receivers for the railway were several weeks in coming to any agreement with the Council in regard to the life of the franchise. Time limits running all the way from three to twenty years were discussed before a franchise to run for three years was finally agreed upon. City officials contended that inasmuch as the average life of a bus is approximately five years, a trial period not to exceed five years should be allowed. The railway receivers argued against the short-term investment involved in a temporary franchise.

Once the time limit on the franchise had been arranged and announcement made of the routes tentatively established for the nine services, but further delays were experienced because disagreements arose anent the proposed routings. Loading zones were asked for at the Union Station, but they were protested by the Kansas City Terminal Railway, which controls the station, and by the attorneys for the Yellow Cab & Baggage Company. An express line to and from the Country Club districts is planned and has been much discussed and argued against by Aldermen and citizens from various other sections of the city, particularly on the score of the 25-cent fare which is presumably to be charged for this service.

Even now, with only a few minor points in the ordinance to be settled and the bill passed and signed, it is probable that the first of April will have gone before the Kansas City Railways may be free to carry out plans, purchase buses and start the proposed service.

A period of two weeks is required to put an ordinance through the Council in the event no objections or arguments are raised. After that has been done the receivers will be obliged to present the plans to Judge Kimbrough Stone, referee, for his consideration and approval or rejection. If all the remaining obstacles are quickly surmounted, regular service by bus may be in operation in Kansas City, Mo., some time in May or June, it is said.

The railway is operating a regular service with six buses in Kansas City, Kan., carrying traffic in the outlying district of Argentine to the present terminal of intercity car service over the viaduct.

Transit Survey of Cleveland Proposed

Cleveland and its suburbs are seeking to co-operate with a view to treating the transportation problem in the metropolitan area of Cuyahoga County as a whole. With this thought in mind, a transportation committee for the metropolitan area of the county has just been named, with Alfred R. Horr, vice-president of the Cleveland Trust Company, as chairman.

Mr. Horr has just returned to Cleveland from New York, where for ten years he was vice-president of the Equitable Life Assurance Society. He has been a director of the Third Avenue Railway, the Coney Island & Brooklyn Railway and the Brooklyn City Railroad. Mr. Horr says that his committee will attempt to solve the transportation problems of Greater Cleveland, which includes the suburbs, instead of Cleveland alone. To do this, it may be necessary to amend the Tayler service-at-cost franchise under which the Cleveland Railway is run.

Serving with Mr. Horr on the committee are the Mayors of Lakewood and Cleveland Heights, one of the East Cleveland city commissioners and two Cleveland Councilmen.

Buses Regulated in Indiana

Motor Carriers There Placed Under Commission Regulation—Certificates of Convenience and Necessity Provided—Permits to Operate Transferable

BUSSES and trucks operated for hire in Indiana have been brought under the jurisdiction of the Public Service Commission. The bill to that effect has been signed by the Governor. The measure is a compromise. Traction interests arrayed themselves behind the so-called Moorehead bill as best designed to accomplish the degree of responsibility that they thought ought to be assured by the proposed legislation. The bus interests, as two years ago, protested on the ground of the alleged severity of that measure, saying that strangulation would result under the imposition of the Moorehead bill as presented originally. They introduced a bill of their own which called for regulation by the State Highway Department.

The new law is to supplement the public utilities law, which gives the commission power to adopt rules and regulations to govern applications for certificates of public convenience and necessity. The original bill required that all bus and truck operators should be compelled to obtain certificates of convenience and necessity from the commission and required the commission to give "consideration to the service rendered in the territory by steam and electric railroads and other motor vehicles." The words "steam and electric railroads" were stricken out of the bill by the House, making it within the power of the Public Service Commission to consider only the existing motor lines in the territory in determining whether or not an applicant is entitled to a certificate for operation.

The Senate amended the Moorehead bill so that all bus and truck companies in operation over fixed schedules 90 days prior to the taking effect of the act would be entitled automatically to certificates of convenience and necessity. Bonds which will guarantee the payment of damages if caused by any vehicle through careless operation must, however, be filed with the commission before the certificate may be granted. By an amendment made in the House these bonds may be taken out in mutual associations or reciprocal exchanges, but they are to be subject to the approval of the commission.

PERMITS TO OPERATE ARE TRANSFERABLE

By another amendment made in the House the certificates granted by the commission may be sold, bequeathed or transferred just as is any other property. It has been pointed out that after all existing motor transportation companies have received certificates it is reasonable to assume that few occasions would ever arise by which a bus company would come before the commission with an application for a certificate, since the rights can be bought and sold.

Where bus companies already are in operation in cities or towns continuous thereto under contract the Board of Works or Common Council may continue to supervise, control and contract for such service and determine when, if at all public convenience and necessity, require that competing service shall be established. The determina-

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tion of any such board or Council may, however, be appealed for review to the Circuit or Superior Court of the county within 20 days. The penalty for violation of any of the provisions of the law is a fine of $10 to $100 for each offense, each day constituting a separate offense. The commission also may cause any certificate to be revoked. Each section of the law is independent of the other.

The original bill was introduced by Senator Robert L. Moorehead, Marion, Republican. It was based on the recommendations of the Bus Regulation Survey Commission, which worked under A. M. Glossbrener, Indianapolis, at the instance of the State Chamber of Commerce. The Indiana Highways and Motor Association, led by Samuel E. Hadden, secretary, and Robert I. Marsh, attorney, fought for the amendment to the bill along with other motor bus owners and the associations representing the motor carriers.

Conference Proposed on Conditions in Buffalo

Herbert G. Tulley, president of the International Railway, Buffalo, N. Y., continues to ignore the insidious threats and charges made by the politicians. He has, however, informed the City Council that the railway will not commit itself to any paving or track reconstruction. He says that the criticism of the railway is having a serious effect on the ability of the management to raise funds for necessary improvements.

The Chamber of Commerce has asked the Public Service Commission to investigate service conditions so that "necessary steps can be taken to compel the company to give such additional service as may be required." As a result William R. Pooley of the Public Service Commission says a survey will be made by the commission to determine the adequacy of the service in Buffalo. The commission also has called a conference to be attended by the municipal authorities, President Tulley of the International and Thomas E. Mitten, Philadelphia, of Mitten Management, Inc. It is to be held March 25 in Buffalo.

Mayor Schwab continues his threat to declare a transportation emergency in Buffalo so as to enable him to permit the return of the jitneys in an effort to force the company to operate more cars. The railway says this plan will only tend to reduce the company's revenues and force a fare higher than 8 cents, the rate authorized by the commission.

An appeal from the 8-cent fare is being considered by the City Council. Dr. Milo R. Maltbie, the city's utility expert, has made a report on traction facilities in Buffalo, but his findings have not been made public. It is reported, however, that Dr. Maltbie has recommended that no appeal be taken from the 8-cent fare decision of the board because of the fear that a review by the commission might result in a fare still higher than that now in effect. Some members of the commission are said to feel that the fare was based on a valuation of the company's property in Buffalo that was too low.

Jitneys Regulated in Terre Haute

Protest of Merchants Results in Ruling Autos Off Street Car Streets—Ordinance Provisions Summarized

Objection by merchants along Wabash Avenue, the main street in Terre Haute, Ind., to jitneys has resulted in the City Council passing an ordinance which prohibits jitneys from parking longer than 5 minutes on a street in the congested district and from receiving or discharging passengers on any street upon which an electric railway operates.

The protest was against the great amount of parking space occupied by jitneys operating on six lines, four of which paralleled street car lines. More than two blocks of curbing was used by the jitneys, barring customers' automobiles.

Immediately upon enforcement of the traffic ordinance the Terre Haute division of the Terre Haute, Indianapolis & Eastern Traction Company entered four large buses in competition with the jitneys which were operating. On all lines but one the jitneys were ordinary sedans or California-topped automobiles. The railway buses are front-entrance type, one-man operated, with pay-enter cash fare boxes. Transfers are issued from cars to the company buses and vice versa.

The new traffic ordinance, of which only one of twenty-six sections applied to jitneys, had been in effect about a month when G. O. Nicolai, manager of the Terre Haute division, announced on March 12 that additional buses had been ordered by his company. At that time the company's two bus lines were being operated on 15-minute schedules. Mr. Nicolai declined to say whether a new line was to be started or a closer schedule instituted on the present service.

Jitney Men Seek Aid of Court

Following is the section of the traffic ordinance regulating the jitneys:

(Passenger-Carrying Vehicles — Other than Street and Interurban Cars—No person, firm or corporation operating any jitney, city bus or interurban bus for hire shall receive or discharge any passengers upon any street, avenue or roadway at any point thereon upon which there is located any street car tracks or track, upon and over which street or interurban cars are regularly operated.

No street car, interurban car or vehicle for hire shall remain standing on any street within the congested district for the purpose of receiving or discharging passengers for a period exceeding 5 minutes at any one time.

Provided that none of the provisions of this section shall apply to any taxicab, or owner or operator thereof, when such taxicab is operated only upon a specific call by telephone or otherwise under a specific contract for hire, from a public or private garage or station maintained for the purpose of receiving such calls, and the destination of which taxicab is wholly under the direction of a passenger or passengers transported therein and the route of which is over any street or streets available for travel thereto; nor any vehicle, nor the owner or operator thereof, when such vehicle is operated by a hotel owner in the conveyance of guests between such hotel and any railroad or interurban station.

Immediately upon passage of the ordinance the operators of the jitneys sought and obtained a restraining order against the city to prevent enforcement of the measure until a hearing was had on a petition for an injunction. In the Vigo County Superior Court No. 2 the injunction was denied. The court held that a City Council had the right to determine how each street was used.

Indiana Interurban Reduces Fare as Experiment

The Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., has decided to reduce fares for a month as an experiment. In the past the rate has been 3 cents a mile. The new rate will be 2 cents for 30 days, but only on round trip tickets. One-way tickets will sell for the old rate.

The company had been making Sunday excursion fare concessions for some time. These have proved so beneficial in creating new business that it was decided to extend the reduction to week days to see whether the results would be proportionately as great. The company hopes to appeal to the public to make more general use of the railway and is directing attention to the advantages which are offered by the new rates.

Although the move by the company is entirely independent on its part, it is said that other interurbans of Indiana are awaiting with interest a report on the outcome of the reduced tariff test to see whether earnings are increased without any undue increase in operating expenses.

Financial Backers of New Missouri Road Not Disclosed

George R. Collins, Kansas City, who said he was general manager for Lee Dunlap, principal promoter of the proposed St. Louis-Kansas City Short Line Railroad, testified on March 6 that he was first approached on the subject of an interurban line between the two principal Missouri cities by George Harrison, vice-president of the New England Bank, Kansas City. Mr. Harrison told him that his father, a banker at Glasgow, Mo., was promoting the road and had invested $35,000 for preliminary work, but that he wanted help. This talk took place nearly 10 years ago. The project was permitted to slumber during the war, but Mr. Harrison and his associates recently interested a syndicate in the proposed road.

Charles Miller, counsel for the Chicago & Alton, sought to obtain the names of the members of this syndicate, but Mr. Collins declined to furnish them. Finally, on advice of L. C. Boyle, attorney for the promoters, he furnished the names of the officers of the new line. They are: E. W. Lawhorn, St. Joseph, president; Lee Dunlap, second vice-president; W. H. White, St. Joseph; W. R. Cawthorn, Columbia; Dr. H. K. Gibbins, Fayette, and State Senator Walter Brownlee, Brookfield, directors.

Mr. Collins stated that the new road, a 238-mile system, will be 40 miles shorter than the Wabash, the shortest steam road between St. Louis and Kansas City. It will serve nineteen towns now without railroad facilities. It will be equipped with electricity.

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Hearing on Subway Relief

Commission Engineer Holds Lengthening of Local Platform Easiest to Increase Subway Capacity

An extended hearing was given to the subject of the lengthening of the platforms of local stations by the Interborough Rapid Transit Company on March 16 by the New York Transit Commission. In general, opinion seemed to favor the plan from the transportation standpoint as the quickest and easiest way of increasing the subway capacity, though the company declared that it should not be obliged to pay the expense of this lengthening.

Daniel L. Turner, consulting engineer of the commission, specified that the present platforms at the local stations were of various lengths, but that 81 platforms would have to be extended at 48 stations, aggregating 2.2 miles, to permit operation of ten-car local trains. This would add about 380 additional cars during the rush hours and would increase the capacity of the subway from 25 to 33 per cent. His observations indicated that in making a trip two-thirds of the passengers use at least two trains, one express and one local, and that one-third of the passengers use three trains, one express and two locals. The cost of reconstruction of the platforms was estimated by him at $12,000,000, and the cost of the 382 additional cars, of which 70 per cent would be motor cars and 30 per cent trail cars, would be $10,425,000. Additional power and other equipment would add $6,196,000, thus making a total of $28,621,000.

President Hedley for the company admitted the change would increase the capacity of the subway, but pointed out that the proposed plan would unbalance the relation between local and express traffic, which, with ten-car express trains, would call for about eight cars on locals. A ten-car train is about the limit for normal operation. The possibility of adding one or more cars to the local trains, properly marking them and opening them up only at the express stops, was also considered.

Chairman McAneny outlined the possibility of the city advancing all of the funds required to make the platform extensions. While under the present contracts the company is required to pay half of the construction cost of additions and betterments that are just and reasonable, this proposed payment would be entirely for city property, the city could finance the borrowing for considerably less than it would be possible for the company to do, and as the city would have to reimburse the company eventually for this expenditure, it would be the gainer by doing the work itself. Further discussion was postponed until a later hearing.

COMPANY WILL CONTEST

At a hearing by the commission on March 19, the company, through its counsel, Mr. Quackenbush, declared it would contest in the courts any attempt to assess on it a part of the cost of extending the platforms, on the ground that these lengthenings were not in the contemplation of the parties to contract No. 3 when it was signed, nor at the time of its readjustment in 1918, nor when the whole matter was again under consideration in 1922. He further stated that the company could raise these large funds now, if at all, only under such conditions as to make the attempt improvident.

Official Comment at Chicago

Heads of Railways Enlighten Stockholders on the Proposed Purchase by the City

Two of the annual reports just issued by the railways at Chicago have brought expressions regarding the Chicago city program from three of the leading transportation men of the city. One came from Henry A. Blair, president of the Chicago Surface Lines and of the Chicago Railways. It is Mr. Blair's only personally penned viewpoint on the city plan. He said in part:

> While fully satisfied of the sincerity of the Mayor's efforts to work out a plan which will deal fairly with all concerned and which will attract to local transportation properties the large amount of new money essential to enlargements commensurate with the city's growth, nevertheless the undersigned has not been able to concur in the view that the proposed certificates can be rendered thus attractive to new investors. Accordingly, as an alternative in case it should be found that the proposed certificates are not marketable the undersigned has submitted for the consideration of the local transportation committee of the City Council a plan whereby the necessary additional money would be obtainable and whereby the enlarged system would be operated at cost (including a fair return to capital) under franchise which the city might terminate at any time upon paying to the investors the amount of their investment.
>
> The Mayor's plan contemplates enlargements and extensions which will require the expenditure of several hundred million dollars in addition to making provision for the investment in existing transportation properties, so that the question of the marketability of the proposed certificates is fundamental to such plan.

Mr. Blair comments on the fact that the security holders of the Chicago Railways are already engaged in complicated law suits over their respective right to dividends and to participate in the election of directors. The significance of this lies in the fact that there is no provision on the city's plan to pay anything at all to some of the security holders and a part of the litigants are among these.

He says:

> It is regrettable that the litigation should have been interjected into a situation so complicated and critical as that presented by the expiration of the present franchises and the maturity of all the company's bonds on Feb. 1, 1927; especially in view of the well-known fact that any plan—no matter by whom proposed—which contemplates sale, lease, consolidation or merger of the company's properties cannot be consummated, under the participation certificate agreement "unless and until the holders of a majority in amount of the total number of the equal parts represented by all of the four series of participation certificates shall consent thereto" in the manner provided in the agreement of Aug. 1, 1907, under which the four series of participation certificates were issued.

Mr. Blair had already approved much of the physical plan of the proposed consolidated system and declared that the co-ordination it proposed was an economic necessity.

Similar approval is given the physical plan by Leonard A. Busby, president of the Chicago City Railway, who devotes nearly 2,000 words in his annual report to a description of the ordinance. His analysis coincides with that given editorially by the ELECTRIC RAILWAY JOURNAL of March 7. He says:

> The proposed ordinance is often referred to as a municipal ownership and operation proposition. In substance it is neither municipal ownership nor operation. As a matter of fact the city will not contribute a single dollar toward the purchase of these properties. While the legal titles will be vested in the city, the beneficial ownership of the properties will rest in the holders of the public utilities certificates until these are paid, either through earnings of the properties or funds provided by the city.

Samuel Insull, head of the Chicago Rapid Transit Company, the elevated lines, warmly indorsed the project in his annual report, not, he explained, that he abates his mistrust of municipal ownership and operation a whit but because it is the closest approach yet made to offer the city an ideal transportation system. He said he would accept the "Schwartz certificates" which the city will offer in payment.

Toledo Board Wants Action

Prompt action of some kind on a plan to give Toledo, Ohio, better railway service and enable a fare reduction is expected as a result of the dispatch of a letter to the City Council on March 16 by the street railway board of control. The board expresses the belief that "after four years of operation of this franchise ordinance Toledo is not served by adequate, comprehensive and unified means of service." In conclusion the board says:

> We therefore respectfully recommend that you promptly give thorough consideration to a comprehensive study of the transportation problem and that you promptly invite from the Community Traction Company a proposal for remedying the transportation situation:
>
> 1. As to the immediate improvement of service.
> 2. As to the discharge of accrued financial obligations to the city.
> 3. As to the prompt repair of pavements and the rebuilding of defective tracks and for the providing of a crosstown service and such improvements to and extensions of the system as shall adequately serve the community's needs.
> 4. As to the immediate lowering of the rate of fare.
>
> We respectfully urge prompt consideration of this matter by your honorable body.

Back of the action the City Council holds in its hands the home-rule power over buses and has before it two or three plans for city-wide systems which would compete directly with the traction lines.

Officials of the Community Traction Company have already laid before the Council a plan to reduce expenses by the elimination of bus competition, make further use of one-man cars, adopt the skip-stop and carry out other minor economy features.

Bill to Abolish Utah Utilities Commission Killed

A bill providing for the repeal of the state law creating the Public Utilities Commission of Utah was recently killed by unanimous vote of the members of the House at the legislative session now being held in that State. The measure was known as House Bill No. 32. It was referred to the committee on public utilities and reported out of that committee with the recommendation that the enacting clause be stricken. On motion this report was unanimously adopted.

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Buses in Cleveland by June 15

Buses will probably be operated in Cleveland, Ohio, by the Cleveland Railway, starting about the middle of June, now that Gov. A. Victor Donahey has signed the Collister-Krueger bill giving municipalities control over their local transportation. This bill becomes a law on June 15. It was designed to permit the Cleveland Railway to operate buses. In addition to giving home rule to municipalities in motor bus transportation, the new measure also provides for local control by "contiguous municipalities."

John J. Stanley, president of the Cleveland Railway, has announced that plans of the company call for operation of buses over fourteen routes in the city of Cleveland, and that to carry out this plan between 80 and 90 buses will be required. Sixty per cent of these buses will be single-deck vehicles designed to be used as feeders to the railway system. The other buses will be double-deck. They will be used over two routes, paralleling main lines of the railway. One of these routes will be along Clifton Boulevard through Edgewater Park, from the Public Square to Rocky River, paralleling the Clifton Boulevard line, and the other will be along Prospect and Carnegie Avenues from the Public Square to the Heights section. Railway officials say that if the bus line paralleling the Clifton Boulevard line is as successful as they anticipate, no street cars may be operated during the non-rush hours over the Clifton Boulevard line.

The problem of financing the investment in buses is still bothering the railway officials, inasmuch as the service-at-cost grant in Cleveland provides that no new stock may be issued except at par. The present market quotation of the railway stock is around 92. Councilman Sanders, former city street railway commissioner, has suggested that the company be permitted a special allowance of 3 cents a car-mile for the purpose of buying buses. This idea has met with favor in railway circles. If this is done, the amount expended for buses in Cleveland would not become a capital investment. Councilman Peter Witt, also a former street railway commissioner, has suggested that the city issue $250,000 in bonds, buy the buses itself and lease them to the railway.

Franchise Negotiations at Oakland Unproductive

Inability of the city of Oakland, Cal., and the Key System Transit Company to agree on terms has made it impossible for the proposed new franchise to be voted on at the spring election. The company some time ago made a request for an indeterminate franchise. Leon Gray, City Attorney, in behalf of the municipality offered a 50-year franchise. President C. O. G. Miller of the railways stated that only under an indeterminate franchise can the interests of investors be properly protected.

Mayor John L. Davie and Commissioner Frank Colbourn oppose the 50-year franchise. The Mayor says it is "too long a time." Commissioner Colbourn advised the City Council to "go slow in granting 50-year franchises."

In rejecting the terms of the 50-year franchise Mr. Miller said substantially:

> While we are prepared to join in his earnest effort to simplify and make possible the adoption of charter amendments which will protect the public interest and permit the owners of the present franchises to surrender their franchises for resettlement franchises, there are some provisions in the proposed amendments which, if not modified, will make it impossible for us to do so.
>
> We owe the public the best possible service, but in order to discharge that duty it is essential to the security of the investors that they be protected by franchises containing proper franchise provisions. The franchise situation of the company is bad, but not desperate. Some of our present franchises have only a short time to run, but they are reasonably workable in their present shape. Others are too short in their terms to permit permanent refinancing. The engineers now making a survey of the traffic needs of Oakland have intimated that it will not be possible for them to accomplish their purpose without new franchises for additional lines; that such franchises cannot be provided under existing charter provisions, and that the charter must be amended. The company desires such provisions so it can comply with the purpose of the survey. It will be readily appreciated, however, that this company cannot surrender its existing franchises and accept new franchises so burdened with restrictions and unreasonable obligations as to impair its usefulness to the public. To adopt such amendments would not better the situation but would delay the possibility of carrying out the recommendations of the board of engineers.

As a substitute for the 50-year franchise the company has submitted its own proposal to the effect that the City Council shall grant indeterminate franchises to expire only when the city is ready to take over the railway and "pay a reasonable price" for it.

Articulated Service Is Begun in Atlanta

Buses were placed in service on Sunday morning, March 8, by the Georgia Railway & Power Company through the Ansley Park and Morningside Drive section and also the Sylvan Hills section, in accordance with requirements recently imposed by the Mayor and General Council. This service is to be continued until the permanent coach service can be established through this and other territory asked on behalf of a corporation to be owned by the Georgia Railway & Power Company.

For this temporary bus service the company is using the buses formerly owned by the Crosstown Express and operated through this territory. The company explains that they are not to be taken as indicative of the type of coach which the company will use on its permanent coach routes. The company will make a thorough investigation of coaches and select modern coaches of the most approved and attractive type for this service. The necessity for starting the bus lines immediately compelled the use of the buses at hand.

The fare for a ride on the buses for any distance or for any ride on the combination use of these buses and the railway system of Atlanta will be 10 cents per person per ride. A passenger boarding one of the buses on an inbound trip will pay 10 cents. Passengers desiring to transfer to the railway system will, upon request being made at the time of the payment of the fare, be issued a bus-street railway exchange ticket, which, upon presentation on the first connecting railway car at the point of transfer or exchange, will insure the same rights as the railway fare.

A temporary order, preventing enforcement of the city ordinance designed to end jitney operation in Atlanta, was granted in Superior Court on March 6 by Judge George L. Bell upon petition of bus owners and operators of 110 cars. The ordinance to abolish the jitneys was designed to be effective at midnight on March 8.

The petition asked the court to declare the ordinance null and void on the ground that it was unreasonable and discriminatory and that it violated the state and federal Constitutions. It termed the anti-jitney ordinance a "legislative and propaganda scheme to put the jitney out of business, not a law to regulate but to prohibit." It added:

> The ordinance is a result of a political and propaganda campaign of the Georgia Railway & Power Company to stifle competition; but now the company has gone into the jitney business itself, obtaining under this ordinance a monopoly.

Argument on the matter was begun before the court on March 14, but the presentation of the case was not completed that day and adjournment was taken until March 16.

Breaking Ground for New York's New Subway

Mayor Hylan broke ground on March 14 for two sections of the city's new subway system. The ceremonies were held in the public square at Hancock Park, 123d Street and St. Nicholas Avenue. The Mayor's speech was sent out by radio from the municipal broadcasting station.

Following the speechmaking, the Mayor, with a silver pick and spade, broke ground in Hancock Park, under which the new line will be built. This part of the line, known as Route No. 78, Section 3-A, extends under St. Nicholas Avenue from 122d to 133d Street. The contractor is the Rosoff Engineering Company.

The other section for which ground was broken immediately following the Hancock Park ceremonies is Route No. 78, Section No. 3, extending from Eighth Avenue and 111th Street to St. Nicholas Avenue and 122d Street.

The value of the two contracts in the aggregate is $9,500,000.

The city's new subway system extends from 193d Street and Fort Washington Avenue, down Fort Washington Avenue to 173d Street to Broadway to St. Nicholas Avenue to 122d Street to 8th Avenue into Central Park West, skirting Columbus Circle, down Eighth Avenue to 53d Street, where a branch will turn east through 53d Street under the East River to the Union Station in Queens.

From 53d Street another leg of the line will go down Sixth Avenue running parallel with the Eighth Avenue line. The Sixth and the Eighth Avenue lines will converge at Greenwich Avenue and Eighth Street, thence down the Sixth Avenue extension to Canal Street, thence down Church Street to either Fulton or Wall Street, thence under the East River to Brooklyn.

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From the Union Station in Queens a branch will extend to Jamaica and another branch will go through Long Island City, Greenpoint, Williamsburg and into central Brooklyn and downtown to meet the tunnel from the lower end of Manhattan, thus making one complete circuitous route connecting Manhattan, Queens and Brooklyn.

The Manhattan routes of the city's new system were adopted by the Board of Estimate last December. The Central Park West-Washington Heights sections of the west side line have already been validated and approved.

It is explained that the routes and general plan for the Manhattan portions of the new subway system are presented first for the reason that the physical difficulties of subway rapid transit construction are greatest in Manhattan and because all lines from other boroughs will pass through the new Manhattan trunk lines.

Another Operator Hides Behind Interstate Commerce Provision

Harrison B. Freeman, receiver of the Hartford & Springfield Street Railway, Warehouse Point, Conn., has filed a damage suit for $5,000 against the Interstate Bus Corporation. The bill alleges illegal competition.

Mr. Freeman stated that a company made up of bondholders of the railway invested $50,000 in buses for the transportation of passengers between Hartford, Conn., and Springfield, Mass., under franchises and the statutes regulating motor vehicles. He complains that the Interstate company started operating buses over the same line on Jan. 21, 1925, without license or registration.

The Interstate company contends that it is not subject to the control of state bodies, but to the Interstate Commerce Commission on the grounds that it is doing an interstate business.

Agreement Up in Rochester

A draft of the proposed agreement between the Amalgamated employees of the Rochester lines of the New York State Railways and the company was to be submitted to the membership in Rochester at a meeting on March 20. The provisions of the pact have not been revealed, but a demand for one day of rest in seven is assured and a plea for an advance over the present 55 cents an hour rate has been intimated. The present contract with the railways will expire on May 1. The Rochester union acts in conjunction with the employees in Utica and Syracuse and on the interurban lines.

Service-at-Cost Measure in Missouri

A bill authorizing cities of more than 100,000 population to adopt a "service-at-cost" plan has been introduced in the Legislature of Missouri at the request of counsel for the reorganization committee of the Kansas City Railways. The bill merely is an enabling act to permit Kansas City and St. Louis to adopt the plan in co-operation with the common carriers subject to approval of the State Public Service Commission.

She Stoops to Inspect

A housewife of East St. Louis, Ill., who has been seen on the cars of the East St. Louis & Suburban Railway so often during the past six weeks was not merely wasting her time by gadding about. She had a task to perform and she did it well, as twenty-four motormen and conductors of the railway will attest who have been commended for their personal appearance and the cleanliness of their cars and rewarded with prizes of $5 each and a day off with pay as recognition of their worthiness as reported by the housewife in question. The woman was acting as inspector general for the railway in its third annual clean-up campaign for cars and car crews. She surveyed necks and steps, collars and floors, fingernails and car seats. On the basis of her reports to W. H. Sawyer, president of the company, 46 men received the maximum reward, while more than 100 others received a $5 bonus.

First Weekly Pass in Maine —Bus Plans

The York Utilities Company, Kennebunk, Me., plans to use the weekly pass starting on March 29. The company proposes to sell the pass, good for bearer, in specified 10-cent zones at $1.25 for the first pass with a rebate of 25 cents if the pass is turned in when the next succeeding week's ticket is purchased. This will be the first installation of its kind in Maine.

Data on the company's activity in the bus field contained in the item published in the issue of the ELECTRIC RAILWAY JOURNAL for March 14 were incomplete and in at least one respect inaccurate. The company states that the new bus service will be given not only to Kennebunkport but will include the discontinued Cape Porpoise branch, so that no part of the territory served by the present line will go unserved. In addition, the new bus line and another new bus line will serve five additional towns. The York Utilities Company, which operates in Sanford, Kennebunk, Kennebunkport and Biddeford, is not in receiver's hands and never has been.

Rice Safety Award Won by Beaver Valley

The Beaver Valley Traction Company, New Brighton, Pa., was presented with the Cecil G. Rice safety award in Pittsburgh on March 2, at the annual safety banquet of the Western Pennsylvania Division of the National Safety Council. Some of the results follow, showing the decrease of various items last year with the average of the previous three years:

	Average of Years 1921–1922–1923	Year 1924	Decrease, Per Cent
Fatal accident	None	None	...
Permanent disability accidents	None	None	...
Accidents causing more than 10 days' disability.	11	4	175
Total number of accidents	51	24	47
Total hours lost	5,051	1,568	233

These accidents are personal injury accidents among employees. The street car accidents are on the decrease, too, but with the inspiration of the Cecil G. Rice award the company says that the effort should be made to reduce further the accidents on the street and thereby add more glory as a result of individual efforts.

The Duquesne Light Company, the Pittsburgh Railways, and the Equitable Gas Company were among the ten companies showing the greatest decrease in personal injury accidents.

Intensive Merchandising Campaign by Kansas Road

Officers of the Union Traction Company, with lines from Nowata, Okla., through Coffeyville, Independence and Cherryvale to Parsons, Kan., are to fight fire with fire. If buses give travelers better service, so will the interurban. If trucks running on Montgomery County hard-surfaced roads offer better service to express and other shipments, so will the Union Traction. In line with the new policy the company is broadcasting the word of special care and speed for express with two deliveries daily to any town on the lines. Special facilities are offered the regular shipper in the way of accommodations.

In the passenger department, the inroads of the motor cars were ignored for years. Traffic fell off and the road cut the schedule from the original hourly one to an hour and a half. Later it was cut again.

Late in December came the resolution to offer service in competition with motor cars and hard roads. An order was placed for six new one-man modern type cars for the interurban lines. When they are put into service, possibly by April 1, the old schedule will be abandoned and cars returned to the hourly schedule.

The electric railway between Independence and Coffeyville was built and placed in service in 1907.

New Bus Proposals Called in New York

The Board of Estimate of New York City on March 13, following the recommendation of John H. Delaney, chairman of the Board of Transportation, voted to scrap the 80 applications filed by corporations and individuals for franchises to operate buses on the city streets. The board, at the same time, invited those who seek such privileges to submit new applications not later than April 9. In extending this invitation the board also submitted a questionnaire, prepared by Mr. Delaney, which it suggested all applicants for franchises should answer.

The 80 applicants whose initial proposals must be recast include those corporations and individuals who have submitted proposals to the Board of Transportation or the Board of Estimate since July 1 of last year. They were reviewed in a general way in the bus report filed last month by the Board of Transportation and in which Commissioner Delaney and his associates suggested a city-wide system of about fifty-eight routes. These were finally approved by the Board of Estimate.

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23 Miles of Subway Routes Approved in New York

The Board of Transportation of New York City adopted additional subway routes on March 20 totaling 22.90 miles, the construction cost of which is estimated at $186,046,000. The routes are located in Manhattan, Brooklyn and Bronx, include subaqueous tunnels and are additions to the administration's independent subway construction program which was announced last December by John H. Delaney at a meeting of the Board of Estimate.

Approves Bus Operation Within City

The New York State Railways won another round in its battle for the right to operate buses over the Ridge Road from the suburban town of Greece into the city when the Rochester, N. Y., Common Council recently approved the petition of the Rochester Railways Coordinated Bus Lines, subsidiary of the New York State Railways, for operation within the city. The railway has received the requisite permission from the Town Board of Greece and its plea is pending before the board of Parma. If granted there, the matter will go to the State Service Commission. Buckley Brothers, as related previously in the ELECTRIC RAILWAY JOURNAL, now operate a bus line over the route covered by the traction company's petition. James J. Dadd, secretary of the New York State Auto Bus Association, has announced the intention of the independent owners to carry the fight to Albany in their efforts to prevent the railway winning a franchise.

In the previous reference in the JOURNAL to the bus activities of the New York State Railways it was made to appear that they were to extend to Schenectady. The stock of the Schenectady Railway is owned jointly by the Delaware & Hudson Company and the New York State Railways, the latter being controlled by the New York Central Railroad, but is separately operated. The Schenectady Railway is prepared to enter the bus field, but it will do so through a subsidiary under the direct control of that company.

News Notes

Will Fight Ouster Ruling.—Jitney owners of Huntsville, Ala., are preparing to protest the ruling of the Alabama Public Service Commission, which recently issued an order preventing them from operating between Huntsville and outlying mill suburbs in competition with the electric railway of the Alabama Power Company.

Interurban Passengers Pay Same Amount.—The Public Service Commission has approved new rates of the Rochester, Lockport & Buffalo Railroad for local passenger fares. Fares are so adjusted that interurban passengers will pay the same amount within the city of Lockport, N. Y., as would be charged for a local ride within the city limits. A new regulation provides that an excess fare of 10 cents will be charged on all cash fares over 16 cents. When excess fare is charged the cash fare receipt issued by the conductor will so indicate and such excess fare will be refunded upon presentation of receipt, within 90 days from date of issue, to any authorized ticket agent or at the office of the treasurer.

Employees Inspect Shops.—About 100 employees of the rolling stock and shops department of the Boston Elevated Railway, Boston, Mass., divided in groups of four, recently were taken on an inspection trip to the Albany Street shops of the company. They were escorted by a guide through the drafting room, truck and wheel shop, brass foundry, armature shop, compressor room and other shops. They were met by the respective foremen, who explained the methods used in overhauling and repair work and described the uses of the various machines and equipment. Exhibits were placed throughout the shops for inspection and attracted much attention.

Will Confer on Fare Reduction.—Representatives of the City Council of Glendale, Cal., the Chamber of Commerce and the Pacific Electric Railway will confer with the State Railroad Commission in an effort to find a basis for reducing fares between Glendale and Los Angeles. This decision was reached at a recent special meeting of the Council. If possible, a ninety-day or six-month trial will be given the 10-cent flat rate plan, to see if it will earn a sufficient revenue for the company to warrant adoption as a permanent rate. At present the one-way rate between Glendale and Los Angeles is 23 cents, while 38 cents is charged for a round trip. The rate between Los Angeles and Hollywood is 10 cents each way.

Developing the Service Instinct.—Another company pamphlet made its première on March 16 under the title of "Service." This single sheet, published by the United Railways & Electric Company, Baltimore, Md., is "to encourage helpfulness and co-operation in transportation." The first edition promised that "service" would be the theme of every paragraph and sentence. It gave inclusive and enlightening answers to the question "What is service in Baltimore with street cars and buses?"

Increased Fare or Tax Reduction Needed.—Either the fare must be increased or the taxes assessed against the United Railways, St. Louis, Mo., reduced if the company is to be operated as a going concern, Rolla Wells, receiver for the system, asserts in the current issue of the "United Railways Bulletin," the company's official publication. The gross revenues for the company in 1924 showed a decrease of $1,003,000 compared with 1923, while for the first two months of this year operating income showed a decided falling off compared with the first two months of 1924. Receiver Wells concludes that the car riders will have to make up this deficit by paying higher fares or by interesting themselves in seeing that the tax burden of the company is lightened. In addition to paying high taxes the company is also compelled to meet competition from buses, private automobiles and service cars.

Foreign News

Ventilation in Paris Subways to Be Improved.—Complaints of impure air in the subways of Paris, France, have become so numerous and pressing that the Prefect of the Seine has ordered measures taken at once to improve conditions. Disinfection methods have been proposed, but it has been decided that better ventilation and not disinfection is what is needed. The installation of motor-driven fans at four different points is expected to give the desired improvement in ventilation on the Metropolitan system.

Tramways Profit, Buses Lose, in Hull.—An actual net profit of £27,500 will be shown on the tramways operation of the Hull Corporation Tramways, Hull, England, at the end of the financial year, March 31, 1925, according to the report presented before the Hull Corporation tramways committee late in January. This estimate takes into account the loss on bus operation, which is estimated at £5,475. The city engineer was given a contract for reconstruction of part of the Heddon Road track at a cost of £20,951, and his estimate for work on the Holderness Road track was also accepted.

Reports on Electrification in Belgium.—The commission appointed some time ago to inquire into and report on the practicability of electrifying the railroad between Matadi and Leo, in the Belgian Congo, has now presented its report, which is entirely in favor of the project. It is recommended, however, that a commencement should be made with the first 60 miles of the line, between Matadi and Sognololo, which has the most severe grades on the system.

Brazilian Electric Railway Proposed.—A project for the construction of an electric railway from Caracol to Espirito Santo do Puihal, in the State of Minas Geraes, Brazil, is under way.

New Cars for Manchester.—The Manchester Corporation Tramways, Manchester, England, expects to put 70 new vestibule bogie tramcars into service during the first half of 1925. The electrical equipment will be furnished by the British Thomson-Houston Company. The ordinary output of about 25 cars a year from the Town Council's own works will be continued. This additional equipment is required to handle increased traffic. The tramway was extended 8½ miles in 1924, and another 8 miles is soon to be put in operation.

Pre-War Fares in Sunderland.—The Sunderland tramways committee, Sunderland, England, has decided to return to pre-war fares. The 1½d. fare is reduced to 1d., and ½d. is taken off all the higher fares. It is estimated that on the basis of the present traffic this will mean a reduction in revenue of more than £20,000 a year.

Barcelona Subway to be Built.—Three miles of the track of the Sarria electric railroad, leading to the terminal in Barcelona, is to be made into a subway.

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Financial and Corporate

Comment on D. U. R. Situation

Politics and Absent Ownership Held Responsible for Receivership—Bus Had Rather Late Start

Bankers in intimate touch with the finances of the Detroit United Railway, Detroit, Mich., believe that with proper capital changes the road cannot help but work out its difficulties. This is the opinion expressed by the Detroit correspondent of the *Wall Street Journal* in a special dispatch in the issue of that paper for March 16. This writer says the receivership of Detroit United is the result of adding quickly changing transportation conditions to an already incongruous mixture of politics and absentee ownership. He says the statement sent to stockholders is subject to criticism in one respect; instead of slack Detroit business being responsible for the Detroit United Railway receivership, the trouble is due more to the road's inability quickly to avail itself of the kind of facilities now in demand.

SLOW START ON THE NEW PROGRAM

The author of the article proceeds to explain:

> About a year ago the Detroit United began to buy up bus lines and also to install its own buses parallel to its electric lines where riders showed a preference for motor transportation. Commendable work has been done toward building up a system of motor lines both feeding and supplementing the electrics. But it was a late start. Few large American cities depend so largely on individual motor transportation as Detroit. Where 10 years ago the city expanded along the interurban lines and provided electric traffic, the bus and private automobile have made it possible to develop suburban real estate which has no rail service of any kind.

It is further pointed out that since the sale of the city lines to the city of Detroit two years ago the Detroit United, except for a limited amount of freight, has been strictly an interurban and commuters' service. There has been no big city line earning bulk to cushion against.

Whether or not the analysis of the financial writer is correct, the opinions expressed represent the point of view of a man who is generally well informed. He says the receivership is viewed in banking circles as serving a good end in that it will permit a rearrangement of finances and probably new capital acquisitions which will insure carrying out the bus program, the possibilities of which, in an area of 100 square miles having about 1,300,000 population without steam commuter service of any kind, are hardly sounded. On this matter of commuter service the article says:

> There is not a single commuter train out of Detroit on any steam railroad. Even the Michigan Central, with an unused downtown train shed and a string of logical commuter towns toward Ann Arbor, has done nothing to develop suburban business and refuses to install commuter service or give commuter rates.

Many Problems Before London Underground

Traffic Being Lost to Buses—Competition Hurtful—Lord Ashfield Says It Is Absurd to Build Underground Lines and Operate Them at Half Load with Traffic Diverted to Surface Transport

THE gross traffic receipts of the so-called Underground Group, London, England, which comprises the Metropolitan District Railway, the London Electric Railway, the City & South London Railway, the Central London Railway and the London General Omnibus Company, Ltd., for 1924 amount to £12,770,000, an increase of £650,000, or 5 per cent. This percentage increase falls short of the percentage increase in the number of passengers, because the average receipt per passenger in 1924 is slightly less than it was in the previous year, the reduction occurring wholly on the omnibuses. This is due to the bad weather of the summer week-ends. Between April 1 and Oct. 30, out of 30 week-ends not more than a dozen enjoyed sunny, cheerful weather, and the long-distance pleasure traffic was curtailed in consequence. It is also due in small part to minor adjustments in the fares charged.

The aggregate operating expenses are £10,820,000, and these are increased by £897,000 over the previous year. As a result the net receipts are £247,000 less than they were a year ago. Lord Ashfield, chairman of the companies, ascribes this to be the starting point of the unfortunate record of the year.

In order to carry the traffic 196,000,000 of miles were worked, an increase of 20,000,000 over the preceding year, or 11 per cent. Of these miles 137,000,000 were worked by the omnibuses, an increase of 18,500,000, or 16 per cent over the previous year. The remaining 59,000,000 were worked by the cars of the railways, an increase of 1,500,000, mainly required for the service of the newly opened Edgware extension. Thus while traffic receipts increased by 5 per cent the work performed to carry the traffic increased by 11 per cent.

The total number of passengers carried averaged almost 4,500,000 daily, and amounted for the year to 1,457,000,

COMPARATIVE STATEMENT OF THE OPERATING RESULTS OF THE LONDON UNDERGROUND GROUP YEAR 1924, COMPARED WITH 1923

	Total Railways		London General Omnibus Company Limited		Total	
	1924 £	Increase + £	1924 £	Increase + £	1924 £	Increase + £
Traffic receipts, etc., after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8, 1921	4,371,636	*93,069*	8,398,565	+743,152	12,770,201	+650,083
Expenditure	2,766,368	*10,436*	8,053,315	+907,733	10,819,683	+897,297
Net receipts	1,605,268	*82,633*	345,250	*164,581*	1,950,518	*247,214*
Miscellaneous receipts (net)	484,845	*13,391*	315,206	+19,529	800,051	+6,138
Net income	2,090,113	*96,024*	660,456	*145,052*	2,750,569	*241,076*
Interest, rentals and other fixed charges	950,843	+183,169	205,525	+25,513	1,156,368	+208,682
Balance	1,139,270	*279,193*	454,931	*170,565*	1,594,201	*449,758*
Appropriation to reserve for contingencies and renewals	155,000	*60,000*	250,000	*125,000*	405,000	*185,000*
Balance	984,270	*219,193*	204,931	45,565	1,189,201	*264,758*
Appropriation for equalizing the charge in respect of interest on the 4½ per cent redeemable second debenture stock	.....	*82,500*	.....	.....	.....	*82,500*
Balance	984,270	*136,793*	204,931	*45,565*	1,189,201	*182,258*
Dividends on guaranteed and preference stocks	389,477	.....	.....	.....	389,477	.....
Balance	594,793	*136,693*	204,931	*45,565*	799,724	*182,258*
Add balance from last year's accounts	319,137	+65,944	64,641	*7,121*	383,778	+58,823
Total amount available for dividends on ordinary stocks and shares and for other purposes	913,930	*70,749*	269,572	*52,686*	1,183,502	*123,435*
Dividends on ordinary stocks and shares	665,542	.....	209,070	*48,547*	874,612	48,547
Rate per cent per annum	3.90	.....	6 (Free of Tax)	*3* (Free of Tax)	4.43	*.37*
Balance carried forward to next year's accounts	248,388	*70,749*	60,502	*4,139*	308,890	*74,888*

Figures in *italics* denote decrease.

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MISCELLANEOUS STATISTICS OF LONDON UNDERGROUND GROUP YEAR 1924, COMPARED WITH 1923

	Total Railways		London General Omnibus Company Limited		Total	
	1924	Increase +	1924	Increase +	1924	Increase +
Passengers carried:						
Ordinary	205,881,127	*774,418*	1,158,411,377	+118,475,655	1,364,292,504	+117,701,237
Workmen	45,479,306	*3,045,565*	.....	.....	45,479,306	*3,045,565*
Seasons	46,995,650	*3,365,750*	.....	.....	46,995,650	*3,365,750*
Total	298,356,083	*7,185,733*	1,158,411,377	+118,475,655	1,456,767,460	+111,289,922
Average daily number of passengers carried	886,740	*20,899*	3,510,338	+ 433,605	4,397,078	+ 412,706
	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.	M. Ch.
Route-miles owned or leased	71 64	+ 4 14	....	....	71 64	+ 4 14
Route-miles run over by companies' trains	139 59.5	+ 24 64	....	....	139 59.5	+ 24 64
Road-miles run over by company's omnibuses	... .	....	778 0	+ 25 0	778 0	+ 25 0
Number of stations or garages	120	+ 3	40	+ 5	160	+ 8
Number of lifts	192	*31*	....	....	192	*31*
Number of escalators	32	+11	....	....	32	+ 11
Number of car-miles run in relation to passenger receipts	58,896,079	+1,518,425	137,050,535	+ 18,556,809	195,946,614	+ 20,075,234
Number of car-miles run by companies' trains or omnibuses	70,496,856	+1,820,986	137,050,535	+ 18,556,809	207,547,391	+ 20,377,795
Number of cars or omnibuses owned	1,561	+ 206	4,115	+ 246	5,676	+ 452

Figures in *italics* denote decrease.

an increase over the previous year of 111,000,000, or 8 per cent, and an increase of 285,000,000, or 24 per cent, over the year 1920, which represented the highest point in the artificial post-war prosperity. Never before has this group of companies carried so many passengers. The whole of the increase in the traffic has fallen to the share of the buses, with the result that more than 7,000,000 further passengers gained by the omnibuses have been lost to the railways. Lord Ashfield explains, however, that despite the loss by the railways it has not enabled any reduction in train service to be effected or any other economies to be made. As he has put it, the loss falls wholly upon the net receipts, and reduces the balance available for distribution in dividend upon the capital. What the buses have gained has been more than offset by the expense incidental to working a larger fleet of buses, so that here again the net receipts are less. For these reasons the common fund, after meeting all the calls properly made upon it, was £819,724, or £182,258 less than it was in the year 1923.

Competition Unfortunate

To Lord Ashfield it certainly is foolish to have provided underground railways to deal with congested traffic and then to permit them to be operated with half loads while other means of transport intervene to rob them of their traffic and retain it on the streets, not only restoring the congestion but making it more dangerous and tedious in the process.

Since Jan. 1, 1919, up to Dec. 31, 1924, the Underground group has spent on extensions and improvements, on new buses and garages, in one way or another £15,600,000, and is committed to a further expenditure of £5,350,000 to complete construction upon which the companies have already embarked. Until this expenditure becomes self-supporting by attracting additional traffic to the system as a whole Lord Ashfield says the management cannot possibly venture upon any fresh schemes of expenditures. The forward policy must, therefore, unless some change in the situation takes place, become a conservative policy. Although the management is being pressed to extend the Underground system and build new tube railways to all these projects it must turn a deaf ear. Not that many of them are not desirable and needful, but, as Lord Ashfield explains, "if London hopes to secure the execution of these projects, it can only be as part of a considered scheme of transport facilities, in which the various means of transport are co-ordinated, so that each takes only its proper share and in which the present unchecked and destructive competition is brought within reasonable and fitting limits."

As Lord Ashfield sees it the root of the company's present troubles is competition. There are 500 independent buses being run in London. The first of these buses appeared in 1922. At the close of 1922 there were 13; at the close of 1923 there were 194; at the close of 1924 there were 499. The owners consist of eight companies or groups of persons, owning from 44, the maximum, down to 12, the minimum number, and after that of numerous individual proprietors, of whom no fewer than 105 are the owners of one bus.

Lord Ashfield says that from the point of view of London traffic, and not alone from any selfish point of view, this incursion of individual omnibus proprietors should never have been permitted. As he sees it, it is a misfortune both to London and to the proprietors themselves that will require much tact and discrimination to clear up. One of the questions he suggests for answer is how a co-ordinated system of routes and services is to be secured out of a group of omnibuses owned by no less than 186 separate companies or persons. He was constrained to say:

> Does London want an orderly, efficient, economical system of transport? Then London must see to it that such measure of regulation and control is secured as will enable such a system to be maintained and developed.
>
> The London General Omnibus Company has entered into agreements with the associated tramways for the pooling of the traffic carried over the roads worked in common with them, and for the sharing of this traffic equitably between them in proportion to the services rendered. It was then possible for the tramways to look with less anxiety upon, say, the great development of routes to Wembley this last year, because they knew that out of the omnibus company's takings they might be able to claim some share if their own share were inadequate or unjust. The public needs were fully met, and the tramway company was not unfairly prejudiced. We have found, as those who are concerned with the administration of the London traffic act will find, that the only solution of this traffic problem is some means by which the warring separate interests may be resolved into a common interest, by which the many managements, with divergent aims, may be consolidated into a common management.

Lord Ashfield says he regards the London traffic act of 1924 to constitute the most important event of the past year and a landmark in the London traffic problem. All the talk and inquiry of a score of years is now focused in this act. The act itself provides little in the way of control, but it sets up machinery which can be used for control. This power rests in the Minister of Transport, acting largely under the advice of a committee composed of representatives of the various authorities in and adjacent to London, and of representatives of the police and central government. In conclusion Lord Ashfield said:

> The London traffic act of 1924 is, as I have said, a first step, but the first step is always the hard step. I fear the end of our troubles is not yet in sight, and many vexed questions must be resolved before we are in smooth waters, but I have confidence in those now intrusted with the responsibility for London traffic, and I feel sure that, given good will and breadth of view, good must come out of this act, for now that a start has been made we must march toward some goal, even though it is not exactly the goal at which I should aim myself.

New Holding Company Announces Financing

The National Electric Power Company, New York, is the new company formed to take over the control of the Cumberland County Power & Light Company, serving Portland, Me., and vicinity, and the Northwestern Public Service Company. It will own approximately 97½ per cent of the common stock of the Cumberland County company, which operates the Portland Railroad, and all the common stock of the Northwestern Public Service, which serves a wide area in South Dakota.

The Maine property was recently acquired by Albert Emanuel & Company, New York, who in the last year and a half have also acquired many small properties in the zone of the Northwestern Public Service Company.

In connection with the work of carrying out the details of the plan an issue of $3,750,000 of National Electric Power Company 20-year 6 per cent secured gold bonds was offered on March 16 by A. C. Allyn & Company. This is the first financing for the new holding company. It is to be followed, it was learned, by an offering shortly of $1,500,000 of 7 per cent cumulative preferred stock of the par value of $100 a share. In addition there is to be an issue of 10,000 shares of 7 per cent non-cumulative preferred, $100 par value, but this issue will not be publicly offered.

The properties now held by the

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Emanuel interests in the area served by the Northwestern Public Service Company, including ten small companies taken over within the last several weeks, represent about 60 per cent of the total power generation facilities of South Dakota. They extend in a chain from Aberdeen, in the northern part of the State, to Yankton, in the extreme south, on the Missouri River.

The offering of the $1,500,000 of cumulative preferred shares of the National Electric Power Company will also be made by A. C. Allyn & Company.

Regular Dividend Declared at Boston

The usual quarterly dividend of 1½ per cent has been declared by the Boston Elevated Railway, Boston, Mass., payable on April 1 to stockholders of record of March 17. In the issue of the ELECTRIC RAILWAY JOURNAL for March 7, page 390, it was made to appear that the quarterly dividend had been reduced to 1¼ per cent. This was an error. The directors do not declare dividends at Boston. They are declared by the trustees, and Chapter 159 of the special acts of 1918 under which the trustees were appointed provides that the dividends on the common stock shall after 1922 be at the rate of 6 per cent per annum.

$933,277 Surplus for Market Street Railway, San Francisco

The gross revenue of the Market Street Railway, San Francisco, Cal., for the year ended Dec. 31, 1924, shows a small increase over the preceding year. For the first 6 months there was a substantial increase in gross, but this was partially offset by a decrease in the last 6 months, particularly during Presidential election.

Generally speaking, there were no important changes in service or in operating costs except some slight increases in maintenance charges and general expenses and in the item of expense for conducting transportation, due to a small increase in the rate of wages paid platform men and others effective May 1, 1923. In consequence the wages for the first 4 months of 1924 were approximately 5 per cent higher than for the corresponding months of 1923. On the other hand the slight increases in general expenses were partially offset by a decrease in the rate charged the company for electric power.

There is no deferred maintenance at the present time. In addition to the regular maintenance work, 28,000 ft. of single track was reconstructed and more than 300,000 square feet of asphalt and brick pavement was constructed or reconstructed in addition to the 450,000 square feet of paving which was laid in connection with ordinary repairs.

As soon as the subway along the Embarcadero at the foot of Market Street is open for traffic the company expects to effect material improvement in the service on lower Market Street, as practically all vehicular traffic along the Embarcadero will be diverted from the surface to this subway.

Notwithstanding the great increase in automobile traffic, there has been no material increase in the number of accidents or expenditures for claims. Accidents involving fatalities were fewer than ever before in the history of the company or its predecessor. The company attributes this to the training system for trainmen started several years ago, a development which it is expected will unquestionably continue to reduce both the labor turnover and the number of accidents.

On Dec. 31, 1924, the only outstanding funded debt of the company consisted of $13,000,000 of 7 per cent first mortgage bonds, of which $125,000 were reacquired during the year and placed in the sinking fund.

Charles N. Black, president of the company, says no material progress has been made in the negotiations for the purchase of the company's property by the city of San Francisco, although the committee has held several meetings and the matter is still under discussion.

STATEMENT OF INCOME AND PROFIT AND LOSS OF THE MARKET STREET RAILWAY, SAN FRANCISCO, FOR THE YEAR ENDED DEC. 31, 1924

Operating Revenue:		
Passenger	$9,789,153	
Other	63,075	
Total		$9,852,228
Operating expenses and taxes:		
Operating expenses:		
Maintenance of way and structures	$647,494	
Maintenance of equipment	660,126	
Power (including disputed charges)	1,335,344	
Transportation and traffic	3,587,298	
General and miscellaneous	808,523	
Total	$7,038,787	
Taxes (other than Federal income taxes)	617,000	
Total operating expenses and taxes		7,655,787
Net operating revenue		$2,196,441
Other income credits:		
Interest	$26,525	
Other	10,643	
Total		37,168
Gross income		$2,233,609
Income charges:		
Interest on funded debt	$857,508	
Discount on funded debt	42,656	
Provision for 1924 Federal income tax—Company's estimate	68,235	
Depreciation of railroads and properties	320,000	
Other	11,933	
Total		1,300,332
Net income for the year		$933,277
Surplus, Jan. 1, 1924		1,431,496
Profit and loss credits:		
Profit on purchase of company's securities	$2,320	
Profit on sale of other securities	33,510	
Other	1,230	
Total		37,062
Gross surplus		$2,401,836
Profit and loss charges:		
Refinancing expenses—net	$341,705	
Other	61	
Total	$341,766	
Surplus, Dec. 31, 1924		$2,060,070

OPERATING STATISTICS OF THE MARKET STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1924

Passengers carried:	
Cash fares 5 cents each	194,136,152
Special car passengers	15,200
School and other tickets, 2½ cents	3,195,844
Other tickets, 5 cents each	28,428
Total revenue passengers	197,375,624
Free transfer passengers	64,994,165
Total revenue and transfer passengers	262,369,789
Free passes	593,497
Total passengers	262,963,286
Percentage of transfer passengers to revenue passengers	30.37
Passenger revenue per revenue and transfer passenger, in cents	3.73
Car-hours	2,867,781
Car-miles	25,768,581
Miles of single track leased, etc	17.59
Miles of single track owned	256.21
Miles of single track operated	274.00
Number of passenger cars owned	768
PERCENTAGE OF OPERATING REVENUE	
Operating expense	71.42
Taxes (railway only)	6.26
Operating expense and taxes	77.68
Operating income	22.32
Non-operating income	0.37
Gross income	22.69
Deductions from income	8.76
Net income	13.93

$7,000,000 Montreal Issue Offered

A syndicate headed by Aldred & Company, New York, is offering $7,000,000 of the newly created Montreal Tramways general mortgage issue. The bonds bear interest at the rate of 5 per cent and, at the price of 88 and interest, at which they are offered, yield the investor 5.85 per cent. The bonds are secured by a general mortgage covering the entire property of the company and also other properties which may be acquired in the future. They mature on April 1, 1955.

The total authorized amount of the issue is $100,000,000, but for the present only $17,826,500 will be issued. This last amount is being used by the company to remove all of its perpetual debentures from the market and to replace them with the new bonds.

The new issue has one senior security—the first mortgage bonds, which are limited to an amount not exceeding $25,000,000. Of this issue $21,351,000 are issued. These bonds are due in 1941 and when these fall due the present issue will be a first charge on all the assets of the company.

Of the total present issue of $17,826,500, only $7,000,000 are being offered to the public, these representing the debentures held by Montreal Tramways & Power Company. The financing is being done in connection with the readjustment of the financial affairs of the company, referred to in the ELECTRIC RAILWAY JOURNAL for March 7, page 387.

New Holding Company for Southwest Utilities

The Electric Power & Light Corporation has been organized for the purpose of vesting in it the assets of the Utah Securities Corporation and certain equities in the other utilities which have been acquired by the Electric Bond & Share Company from time to time in the past. Included in the assets of the Utah Securities Corporation is all the common stock of the Utah Power & Light Company, as well as the common stocks and certain other securities owned by the Electric Bond & Share Company, New Orleans Public Service, Inc., the Dallas Power & Light Company, the Dallas Railway, the Texas Interurban Railway and the Power Securities Corporation, the latter company owning the common stock and certain other securities of the Idaho Power Company.

The companies to be included under the new arrangement furnish public

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utility service in 253 communities, of which 245 are supplied with electric power and light service. Among the principal cities served are New Orleans, Dallas, Salt Lake City, Ogden, Durango and Montrose, Colo., and Boise, Pocatello and Idaho Falls, Idaho. The total population served is estimated at 1,179,000. More than 300,000 consumers are served and of these more than 234,500 are supplied with electric power and light.

Under this plan holders of Utah Securities Corporation capital stock will receive $10 per share in cash and four shares of the Electric Power & Light Corporation for each share of Utah Securities. A special meeting of Utah Securities stockholders has been called for April 2 to approve the plan.

Income Bond Payment Declared

Official announcement is made of the decision of the Quebec Power Company directors to pay the interest on the 5 per cent income bonds of the Quebec Railway, Light, Heat & Power Company, Quebec, Que. In commenting on this action the *Canadian Financial Post* says it means that the company has been whipped into such shape that in addition to earning the interest on the consolidated 5 per cent bonds it can show the income bond interest earned as well, and leave a creditable showing on the capital stock. Quebec Power owns 90 per cent of the income bonds, or about $3,000,000, par value. The starting of interest payments on these bonds will mean an income of more than $150,000 a year to Quebec Power. The opinion of the *Post* is that this would seem to assure to the common shareholders of the latter company an increase in the dividend rate this year.

Baltimore Railway Absorbs Competitor

The United Railways & Electric Company, Baltimore, Md., recently absorbed its largest bus competitor, the East Fayette Street bus line. This step is in accordance with the established policy of the company, which believes that the entire transportation system of the city should be under one management.

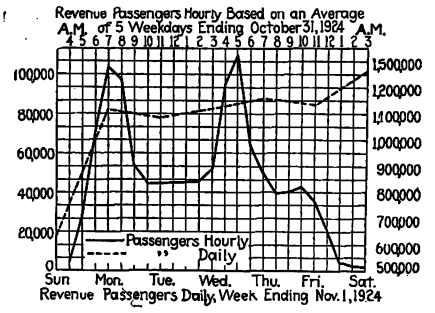
The East Fayette Street bus line operates 21 vehicles, each seating from 30 to 35 passengers, over a route also served throughout its length by the street cars. It is estimated that approximately 10,000 persons a day are being carried on a 5-minute base headway with 2½-minute service during the rush hours. The company came into existence in 1922, when several independent bus owners merged and bought a number of large, well-equipped, modern buses.

The United Railways & Electric Company will take over the buses at midnight on March 31. For the present it is planned to continue operation along the same route with the same schedules and at the present rate of fare. This is now 7 cents on the buses as against 7½ cents on the cars. The railway plans to have its accountants make an immediate study of the operation of the bus line to determine accurately its revenues and expenses.

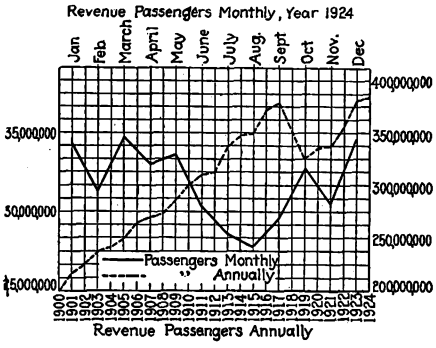
Impressive Presentation of Traffic Fluctuations at Boston

Traffic on the lines of the Boston Elevated Railway, Boston, Mass., varies from the normal base traffic of 45,106 revenue passengers per hour to 115,197 revenue passengers in the evening rush hour, an increase of 155.4 per cent, and then gradually falls off until it reaches its minimum in the early morning (night car) service, preparatory to again starting the upward climb to the morning rush hour peak.

During the days of the week there is a fluctuation no less significant. From Monday to Friday the daily traffic approximates an average of 1,109,861,



Traffic Fluctuations by Day and Hour at Boston



Passenger Revenue Variations at Boston

rising to 1,216,132 on Saturdays and falling to 630,755 on Sundays, an increase over the normal of 9.57 per cent on Saturday and a decrease from the normal of 43.17 per cent on Sunday.

In the variations from month to month during the period of a year the swing is from August, the low point at 27,640,267 revenue passengers, to December and March, the high points at 34,366,600 revenue passengers, or an increase of 24.33 per cent.

Over a long period of years the curve starting in 1900 at 203,521,121 revenue passengers constantly increased to 1917 when it reached 381,017,338 revenue passengers, then passed through a period of recession, and again increased until 1924 when it reached a new high record of 382,888,848 revenue passengers.

Whereas the load from year to year over a long period is slowly on the upward trend, the great fluctuations are by the hour, day and week. These the company is explaining for the benefit of its employees are the factors which make operation difficult, are little known by the car riding public and are not generally appreciated by those actually engaged in the transportation service.

$8,975,000 Philadelphia Issue Offered

Public offering was made on March 14 by Dillon, Read & Company, New York, of a new issue of $8,975,000 of 6 per cent gold bonds of the Philadelphia Rapid Transit Company, Philadelphia, Pa., due March 1, 1962, at 99 and interest to yield more than 6.06 per cent. The sale will furnish proceeds for taking up short term securities totaling $6,750,000 and for other corporate purposes.

Figures made available in connection with the new offering showed that in 14 years under the management of Thomas E. Mitten and of W. C. Dunbar, now president, the company earned a surplus of $16,896,967, of which $11,244,385 was paid out in dividends and $5,652,582 has been put back into the property.

The new bonds are a direct obligation of the company and principal, sinking fund absorptions and interest payments are additionally secured by a direct mortgage on all the property of the Market Street Elevated Passenger Railway by the pledge of the entire outstanding capital stock and lease until the year 2000 of the Market Street Elevated and by guarantee through indorsement of the Union Traction Company of Philadelphia. Reproduction cost of the mortgage property is put at not less than $45,000,000. The company leases and operates 695 miles of track. Its new bonds are callable at 105.

Portland, Me., System Suffers Loss in 1924

The Portland Railroad, Portland, Me., earned during 1924 only about 40 per cent of the guaranteed 5 per cent dividend upon the railroad stock. The deficit for the year was approximately $60,000. This fact was disclosed in the annual report of the board of directors of the Cumberland County Power & Light Company, which controls the railway in Portland and South Portland. The report states that the continued increase in the use of automobiles leaves little prospect for an immediate improvement in railway conditions and intimates that a larger deficit for 1925 is to be expected. The Cumberland property promises to do everything possible to hold this deficit within bounds, but states it is confronted with a decreasing revenue without corre-

INCOME STATEMENT OF PORTLAND RAILROAD

For Years Ended Dec. 31

	1924	1923
Gross income	$1,582,264	$1,703,459
Operating expenses	1,294,781	1,396,808
Gross income less operating expenses and taxes	$287,483	$306,651
Deductions from income	247,598	247,598
Net income	$39,885	$59,053
Dividends	99,950	99,950
Deficit	*$60,065*	*$40,897*

Figures in italics denote deficit.

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sponding decrease in expenses. The accompanying table shows the income account for the Portland Railroad for the years 1924 and 1923.

Willoughby Company Lowers Deficit

A comparison of operation for 1924 and 1923 of the Cleveland, Painesville & Eastern Railroad, Willoughby, Ohio, is shown in the accompanying statement. The company operates 39 miles of track. During the year 1924, according to the 29th annual report, total expenditures for additions and improvements chargeable to capital account were $30,964. The total amount of bonds outstanding on Dec. 31, 1924, was $1,631,000.

STATEMENT OF NET INCOME FOR YEARS ENDED DEC. 31, 1924 AND 1923, AND COMPARISON

	Year Ended Dec. 31 1924	Year Ended Dec. 31 1923
Total gross earnings	$546,743	$631,345
Total operating expenses	423,554	455,816
Taxes	38,772	49,094
Total	$462,326	$504,910
Net earnings	84,416	126,435
Interest and dividends	1,924	1,733
Gross income	$86,341	$128,168
Total income charges	$102,891	$156,242
Net income	$16,550†	$28,073†
Average miles in operation	33.91	33.91
Operating revenue per mile	$16,123	$18,618
Operating expenses and taxes per mile	13,633	14,889
Net earnings per mile	2,489	3,728
Net income per mile	488†	827†

†Deficit.

Increase in Philadelphia Dividend Made Effective

The Philadelphia Rapid Transit Company, Philadelphia, Pa., has declared a quarterly dividend at a rate placing the stock on an 8 per cent basis, as had been promised by the management, the increase of 2 per cent in the annual amount paid being on account of accumulated dividends under the 1907 contract wtih the city. The dividend is payable on April 30 to stock of record April 15.

Will Assume Debts.—In a supplemental order the California Railroad Commission has authorized the Sacramento Northern Railway specifically to assume the debts and outstanding obligations of the Sacramento Northern Railroad, which under prior order of the commission it was authorized to acquire. The order also allows the Sacramento Northern Railway to issue at not less than par $1,000,000 of common stock, and to assume the payment of outstanding bonds of the Sacramento Northern Railroad.

Manager for Receivers Appointed.—Minot J. Hill, general manager of the Trenton, Bristol & Philadelphia Street Railway, Bristol, Pa., has been named manager for the receivers of the Frankford, Tacony & Holmesburg Street Railway, Philadelphia.

Stone & Webster Year Book.—Stone & Webster, Inc., Boston, Mass., have issued the 1925 edition of the booklet in which they present data covering the operations of the properties with which they are identified.

Deficit in Napa.—A deficit of $7,878 was suffered by the San Francisco, Napa & Calistoga Railway, Napa, Cal., in 1924. The gross receipts were $279,416, operating expenses were $186,069, interest on funded debt $59,730, rents paid for leases of road $14,494, taxes $22,838, improvements $2,600 and miscellaneous deductions $1,563.

Seeks to Abandon Line.—The Wisconsin Public Service Corporation has applied to the Railroad Commission to abandon and tear up its tracks on its unprofitable Huron Street line in De Pere, Wis. The line is included in the city's new paving program, with the company's share of the cost estimated at $30,000, covering new rails, steel ties and pavement.

Seeks to Abandon Rather than Repave.—The Illinois Power & Light Company has petitioned the State Commerce Commission for permission to abandon service on the New Street line in Champaign, Ill. The street is to be repaved and, rather than face that assessment, the corporation will give up its tracks. It has proposed to the Council to operate buses over the route.

No Par Stock for Federal Light.—The directors of the Federal Light & Traction Company, New York, have voted to recommend to stockholders at a special meeting to be held April 28 that the common stock be split five shares for one of the present; also that the par value of the shares be changed from no par to $15, and that the par value of the preferred be reduced from $100 to no par.

Will Purchase Carhouse for City Use.—The City Council of Selma, Ala., recently adopted a resolution to purchase the carhouse of the Selma Electric Railway, which went out of business some months ago. The purchase price is $20,000, from which a deduction of $3,000 will be made for a piece of land which will be turned over to the railway. The city will use the building for a fire station and city stables.

Surplus Falls Off.—The gross earnings of the Lake Shore Electric Railway System, Cleveland, Ohio, for the year ended Dec. 31, 1924, were $2,780,953 compared with $2,774,481 for the year ended Dec. 31, 1923. Operation and taxes showed an increase, being $2,176,952 in 1923 and $2,268,642 in 1924. The surplus after the consideration of interest decreased from $172,461 for the year ended Dec. 31, 1923, to $92,199 for the year ended Dec. 31, 1924.

Merger Bill Passed by Senate.—The United States Senate has passed without debate the bill providing for a voluntary merger of the electric railways of the District of Columbia. This was accomplished by the adoption of an amendment, to meet the views of an objector to the terms of the measure as originally drawn, by which the approval of Congress will be necessary to effect consummation of any merger that may be arranged. The bill then went to the House, where, despite the congestion, it was said there was a chance of passage before adjournment on March 16.

Terminal Sold.—Negotiations have been concluded for the sale of the Auroro, Plainfield & Joliet Railroad's terminal at Van Buren and Joliet Streets, Joliet, Ill., to the Illinois Traction System for $47,500. Halsey, Stuart & Company, representing holders of the electric line's bonds, consented to the sale. The traction company has announced that it will remodel the building for its offices and use the structure as a bus line terminal. The traction system has also paid a paving assessment of $17,000 against the electric line.

Wants to Abandon Branch Line.—The Toledo, Fostoria & Findlay Railway will ask for permission to abandon its branch line between Bowling Green and Pemberville, Ohio, according to an announcement by officials of the company. City officials at Bowling Green asked about an improvement to be made along the line and the company immediately took action to give up the operation of that section, which has suffered greatly from competition of private automobiles. The city will not oppose abandonment of the line.

Receiver Appointed for South Bend Road.—Charles Currie has been appointed receiver of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., by Judge Robert C. Baltzell in Federal court. His bond, set at $25,000, was provided. The petition for a receiver was filed several days ago by the Cleveland Trust Company, which sought to foreclose a mortgage on the property and equipment of the defendant. The company operates lines in and between Hammond, South Bend, East Chicago and Michigan City. The proposed plan for the reorganization of the property was outlined in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 7, and subsequent events were referred to in the issue of March 7.

Authorized to Issue $2,141,000 in Notes.—The Department of Public Utilities has granted permission to the Boston Elevated Railway, Boston, Mass., to issue $2,141,000 of notes or bonds, payable in not more than 30 years, to bear a maximum interest of 6 per cent. Proceeds to the amount of $1,200,000 will be applied to the payment and cost of additions to the South Boston power station, $500,000 toward the repair shops at Everett, Mass., $200,000 will be used at the Forest Hills yards and shops and $241,000 will go toward miscellaneous construction work. The bonds are callable on any interest date at 105 after 10 years.

Wants to Abandon a Line in City.—The Jamestown Street Railway, Jamestown, N. Y., has petitioned the Public Service Commission for permission to abandon the Willard Street line in the city of Jamestown. A. N. Broadhead, president of the traction company, says the line has not paid operating expenses for some years. The company also has asked the State Utilities Board for permission to abandon the Chautauqua traction line between Mayville and Westfield. The company also is planning to remove the tracks of the Chautauqua Lake Railroad from Mayville to Chautauqua. The line has been under lease to the Pennsylvania Railroad, which has indicated its intention of giving up the lease.

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Personal Items

Army Colonel to Help Build New York's Municipal Subways

Col. John R. Slattery, Corps of Engineers, U. S. A., has been appointed to the post of deputy chief engineer of the New York Transit Commission. Colonel Slattery will be the principal assistant to Chief Engineer Robert Ridgway in the advancement of New York City's new subway program.

Chairman Delaney of the commission wrote to Secretary Weeks of the War Department last February, requesting that leave of absence be granted Colonel Slattery, so that he might accept this position without forfeiting his army status and prerogatives between then and the date of his retirement next year. Colonel Slattery also made a personal appeal to the same effect. Secretary Weeks declined to grant their petition, explaining that it was contrary to good army policy to grant leaves of absence to army officers to permit them to enter upon municipal employ unless they were already eligible for retirement. Colonel Slattery then determined to resign his commission and accept the tender of the new post.

The new appointee has been in the service of his country since June 16, 1896, when he entered the United States Military Academy at West Point. He was graduated in 1900 and was assigned immediately to the Engineer Corps. During the World War he served in the A. E. F. as a Brigadier-General on the staff of Gen. John J. Pershing. In 1918 and 1919 he was attached to the Seventh Army Corps. Following his recovery from pneumonia in 1920, he served as army engineer in the Columbia River improvement below Vancouver. He has been particularly identified with subaqueous construction for the government. He is a native of Ohio and is reputed to be among the most expert of army engineers.

Ira E. Guthrie Resigns from Interstate Company

Ira E. Guthrie has resigned as secretary-treasurer and member of the board of directors of the Interstate Public Service Company, Indianapolis, Ind. Mr. Guthrie will leave soon after April 1 for Florida, where he will become associated in an official capacity with the Hollywood Land & Water Company, which is building the city of Hollywood-by-the-Sea, Fla.

Mr. Guthrie has been secretary and treasurer of the Interstate since shortly after its organization in 1912. At that time the only property of the company was 62 miles of electric railway between Indianapolis and Seymour. He has witnessed the company's growth until its resources are now in excess of $35,000,000. He was born near Columbus, Ind., and had most of his early business training and experience there. After teaching school for two years he was employed by industrial and banking interests in Columbus until 1903, when he became auditor of the Indianapolis, Columbus & Southern Traction Company, which built one of the first interurbans into Indianapolis. After it was extended to Seymour that road was leased to the Interstate in 1912 for a period of 999 years. Mr. Guthrie was prompted to leave Indiana in the belief that the change of residence to Florida would benefit his wife's health.

George R. Green General Superintendent at South Bend

George R. Green has been made general superintendent of the Chicago, South Bend & Northern Indiana Railway, Michigan City, Ind., and its affiliated lines, the Southern Michigan Railway and the Railway Transit Company, a bus-operating organization.

G. R. Green

This promotion is still another instance of a general superintendent drawn from the ranks of the mechanical forces. In Mr. Green's case it is literally from the ranks, for 24 years ago, at the age of 14, he started in the railway business as an armature winder's helper with the Detroit United Railway. He remained with that property for 18 years, except for three years between 1909 and 1912, during which time he was master mechanic of the Saginaw & Flint Railway.

Advancement was by small steps, but initiative, persistence and hard work, combined with an interest in the problems of his company outside his immediate duties, were bound to receive recognition. He finally rose to the position of general foreman of interurban equipment with the Detroit United.

In July, 1920, Mr. Green went to South Bend as superintendent of equipment. When it appeared that railway service might be supplemented with buses, he was selected to study bus operations in other cities. When the new service was decided upon he was placed in charge of starting and operating the buses. Next followed his appointment to be general superintendent of the rail lines and the buses.

George MacLeod Has Had Broad Career

George MacLeod is the new vice-president and general manager of the Buffalo & Erie Railway Company. The property is one of the new companies which grew out of the reorganization of the old Buffalo & Lake Erie Traction Company.

Mr. MacLeod's experience has been very broad. He has served in the steam railroad line, the electric railway field and has been prominently identified with bridge companies.

Following his graduation from Cornell University in the civil engineering class of 1890, Mr. MacLeod undertook the work of resident engineer of the Louisville & Nashville Railroad. Following this assignment he was superintendent for 7 years of the Kentucky-Indiana Bridge Company and Louisville, Kentucky & New Albany, Ind., belt lines. Later he was named receiver for the New Albany Street Railway, New Albany, Ind. In 1901 he relinquished the managership of the Kentucky & Indiana Bridge Company and the Louisville-New Albany Belt Lines to accept the post of general manager of the Lousville & Albany Railroad. Then in 1906 he became the chief engineer of the Kentucky Traction & Terminal Company, Lexington. Here he remained in a similar capacity until the fall of 1924, when he took on the duties of vice-president and general manager of the Buffalo & Erie Railway Company, with office in Fredonia, N. Y.

O. W. Brain and W. H. Myers, Australian Officials, Promoted

O. W. Brain was recently appointed assistant railway commissioner for the New South Wales Government Tramways, Sydney, Australia. W. H. Myers was appointed chief electrical engineer, succeeding Mr. Brain.

Mr. Brain joined the Crompton Electric Company following an early experience in England and Tasmania. He left that service in July, 1896, to enter the railway as chief assistant to the late P. B. Elwell. When Mr. Elwell was incapacitated through ill health, Mr. Bain was asked to take charge of the branch. This Mr. Brain did, and since Mr. Elwell's death in 1899 the organization in its present form has been built up under his administration.

W. H. Myers, his successor, who held the position of chief assistant electrical engineer of railways, was the first graduate of the Sydney University to obtain the degree of bachelor of electrical and mechanical engineering. Right after graduation he joined the engineering firm of Noyes Brothers in Melbourne, and remained with that firm until the end of 1904, when he received an appointment in the New South Wales Railway department to take charge, under Mr. Brain, of the electrical installations of the new railway station then under construction in Sydney. In 1906, he was appointed assistant electrical engineer and in 1921 chief assistant electrical engineer.

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Charles F. Terrell was recently made general superintendent of light and power of the El Paso Electric Railway Company, El Paso, Tex. In this capacity he succeeds J. F. McLaughlin, transferred to Baton Rouge. Mr. Terrell has been with the Stone & Webster organization for the past 20 years and at Birmingham for the past two years.

Crawford Burris, formerly general foreman in the mechanical department of the Chicago, South Bend & Northern Indiana Railway, Michigan City, Ind., has been appointed master mechanic. Mr. Burris started with the company at South Bend in 1908 and has advanced step by step in the mechanical department since that time.

Robert E. Cornwell, purchasing agent of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway, Michigan City, Ind., has been appointed assistant superintendent of equipment in addition to his present duties. This expansion in responsibility is due to the promotion of George R. Green to the position of general superintendent. In 1903 Mr. Cornwell started with the Indiana Railway as a city street car conductor, later advancing to timekeeper during construction of the Southern Michigan Railway. Following this he became ticket agent and then storekeeper. He held this last position for 14 years, and five years ago was again promoted, this time to become purchasing agent.

Obituary

James Nicoll Dick, chief engineer of power houses of the Montreal Tramways, Montreal, Que., died recently in Montreal. Mr. Dick had just completed a quarter century's service with the company. He was in his sixty-fifth year.

John J. Fahey, claim agent of the Scranton Railway, Scranton, Pa., died on Feb. 16. Mr. Fahey entered the employ of the Scranton Railway in 1906 as claim agent. In 1920 he was appointed chief claim agent, succeeding Stephen Dyer. Some time prior to his association with the company Mr. Fahey was sheriff of Lackawanna County.

Artemas Ward, pioneer in many forms of modern advertising, who introduced the subway and elevated newsstands and vending machines into New York, died recently. In the old days the news business was carried on almost entirely at the entrances to the rapid transit stations, but it was Mr. Ward's idea that after patrons had reached the rapid transit station they usually had several seconds and sometimes minutes in which purchases could be made. Acting on this theory, he went into the elevated and subway news-stand business.

Edward Wickham, treasurer of the Omaha & Council Bluffs Railway & Bridge Company, controlled by the Omaha & Council Bluffs Street Railway, Council Bluffs, Iowa, and president of the Citizens' Gas & Electric Company, is dead. Mr. Wickham was prominently identified with business and civic affairs in Omaha and Council Bluffs.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Improvements in Prospect in Fort Wayne

Approximately $1,300,000 will be spent by the Indiana Service Corporation, Fort Wayne, Ind., in the next year on improvements and construction work in Fort Wayne and vicinity. According to tentative plans outlined by President Feustel, a new car repair shop and machine and carpenter shops will be erected and some of the city lines will be double tracked. In addition to the heavy expenditures in the Spy Run north side plan and shops the company officials announce that new storage and rip tracks and freight house facilities will be built in the south side property recently purchased by the company. Mr. Feustel said the company also was considering the purchase of rolling stock equipment.

Republic Truck Receivership Lifted

The Security Trust Company, Detroit, Mich., has closed its receivership of the Republic Truck Company, Alma, Mich. The second and final payment of 6.0844 per cent to priority creditors and .97107 per cent to general unsubordinated creditors has been made. On July 30, 1924, priority creditors received about 88 per cent and general unsubordinated creditors 14 per cent. Nothing has been paid to subordinated creditors on their claim of $3,486,953, as by agreement their dividends have been added to those of the priority creditors.

Payments by receiver on unsecured claims of $4,861,741, including the $3,486,953 claim of subordinated creditors, total $727,686. A further small distribution of about $30,000 may be made if the government allows a tax refund of that amount. This is not expected.

The Security Trust Company was appointed receiver for Republic Truck Company Sept. 28, 1922, operating the plant for several months and in May, 1923, selling the property to a committee of first mortgage gold noteholders representing about 85 per cent of the $2,500,000 issue.

Many Bus Types Represented at Boston Show

The Boston Automobile Show, held March 7 to 14, maintained its reputation and repeated last year's accomplishment as the most important of the automobile shows in point of view of bus interest displayed. Sixteen-bus chassis or complete vehicles were on view. Parlor car types lead with six, but there were five street car or pay-enter bodies, four sedans and one bare chassis. The vehicles were designated as intended for use in school, tour or

ELECTRIC RAILWAY MATERIAL PRICES—MARCH 17, 1925

Metals—New York

Copper, electrolytic, cents per lb.	14.25
Lead, cents per lb.	9.00
Nickel, cents per lb.	31.00
Zinc, cents per lb.	7.62
Tin, Straits, cents per lb.	53.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.325
Somerset mine run, Boston	2.125
Pittsburgh mine run, Pittsburgh	1.825
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.90
Kansas screenings, Kansas City	2.625

Track Materials—Pittsburgh

Standard Bessemer steel rails, gross ton	$43.00
Standard open hearth rails, gross ton	43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	3.05
Tie plates (flat type), cents per lb.	2.425
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.10
Ties, white oak, Chicago, 6 in. x 8 in. x 8½ ft.	$1.60

Hardware—Pittsburgh

Wire nails, base per keg	2.90
Sheet iron (28 gage), cents per lb.	3.40
Sheet iron, galvanized (28 gage), cents per lb.	4.60
Galvanized barbed wire, cents per lb.	3.55
Galvanized wire, ordinary, cents per lb.	2.60

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.11
White lead (100 lb. keg), cents per lb.	0.1625
Turpentine (bbl. lots), per gal.	0.945
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	16.75
Rubber-covered wire, No. 14, per 1,000 ft.	$6.75
Weatherproof wire base, cents per lb.	19.00

Paving Materials

Paving stone, granite, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.82
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.25

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.625
Light copper, cents per lb.	9.75
Heavy brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4.375
Lead, cents per lb. (heavy)	7.00
Steel car axles, Chicago, net ton	$16.75
Cast iron car wheels, Chicago, gross ton	17.25
Rails (short), Chicago, gross ton	19.25
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	10.75

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sightseeing, electric railway and steam railroad service, as well as for bus-operating company service.

In the parlor car class were the following: Two Pierce-Arrows with Farnham-Nelson bodies, one Pierce-Arrow with Cutter body, one International Harvester and one International Motor (Mack), each with Lang body, and a White with the new Brown body, described as an "interurban parlor coach." The sedan types were exhibited by the Garford, Reo, Graham and Stewart New England representatives. These were all of the medium-sized type carrying from 15 to 18 passengers. Pay-enter or street-car type bodies were shown in the International (Mack) spaces by the Brown Body Company and by the Reo representative. The Mack contribution was a new 29-passenger body, both chassis and body being built by that company. Reo had a 21-passenger type with bodies by the Boston Body Company and the Fitzjohn Company. A source of continuous attention was the Mack Great coach, a six-wheel experimental job, which was shown last October during the American Electric Railway Association exhibit at Atlantic City.

Rolling Stock

Madison Railways, Madison, Wis., has purchased for June delivery six new safety cars of the latest design and construction at a cost of $48,000. The company has also purchased six buses at a cost of $54,000.

Cleveland Railway, Cleveland, Ohio, will probably be in the market for buses in accordance with its intention to run 80 or 90 of these vehicles by June 15. The plan of the company is referred to elsewhere in this issue.

City of Detroit Department of Street Railways, Detroit, Mich., has announced specifications on the 100 additional Peter Witt cars it is going to purchase. The details follow:

Number of cars ordered	100
Name of road	City of Detroit, Department of Street Railways
Type of car	Peter Witt
Seating capacity	52
Total weight	37,000 lb.
Bolster centers, length	23 ft. 9 in.
Length over all	48 ft. 5¼ in.
Truck wheelbase	5 ft. 3½ in.
Width over all	8 ft. 4 7/16 in.
Height, rail to trolley base	10 ft. 9¾ in.
Body	Steel
Headlining	3-star Agasote, 1/16 in.
Roof	Arch
Air brakes	Straight
Axles	5-in.
Bumpers	Elliot type
Car signal system	Faraday buzzer
Control	K 35-H
Curtain material	Pantasote
Designation signs	Hunter
Door operating mechanism	National pneumatic
Hand brakes	Peacock staffless
Headlights	HDB-96
Journal boxes	Symington
Motors	Four 35-hp., 600-volt
Finish	Enamel
Sanders	Osgood-Bradley sand traps
Seating material	Rattan
Step treads	Kass
Trolley base	O B form 1
Wheels	26-in. steel

Guelph, Ont.—Five cars bought from the Guelph Radial Railway for operation on the Ontario Hydro-Electric Railways, Toronto and York District, Scarboro Division, have been overhauled, three by the Ottawa Car Manufacturing Company and two by the Toronto Transportation Commission. They have been equipped with Westinghouse 306-CV-4 motors and Canadian Car & Foundry Company trucks.

St. Catharines, Ont. — Underframes have been laid down at the Niagara, St. Catharines & Toronto Railway shops, St. Catharines, Ont., for two 60-ft. interurban cars, one for the Niagara, St. Catharines & Toronto Railway and the other for the Canadian National Electric Railways, Toronto Suburban District. They will be similar to the car built at the same shops for the Toronto Suburban.

Track and Line

Madison Railways, Madison, Wis., has ordered and will receive next month 120 tons of rails at a cost of $7,500. These rails will be used to double track Atwood Avenue from Division Street to Fair Oaks Avenue.

New York & Queens County Railway, New York, N. Y., is planning to double track its line between Flushing and Jamaica. For this purpose the company expects to use rails taken from its present lines between Corona and the Woodside carhouse and between St. Michaels Cemetery and Riker Avenue in Long Island City. Application is to be made to the Queens County Supreme Court for permission to abandon service on the lines from which the rail will be taken.

Montreal Tramways, Montreal, Que., ordered recently 50,000 ties and has asked tenders for 30,000 more. It has also asked prices for 2,000 tons of 115-lb., No. 508, Lorain section girder rail; 1,000 tons 85-lb. T-rail, No. 1, C. P. R. section; 3,000,000 lb. spikes; 200,000 tie plates, shoulder type; 11,000 standard tie rods; 30,000 lb. track bolts; 35,000 ft. of bonding cable; 100,000 tons broken stone; 20,000 tons sand and 100,000 bags cement.

Pittsburgh Railways, Pittsburgh, Pa., seeks in an ordinance the right to lay single car tracks on Diamond Street west of Grant Street, additional tracks on Diamond and Ross Streets and connecting curves and switches at various locations. The Council by unanimous action affirmed the ordinance, which will mean probable route changes.

Birmingham Electric Company, Birmingham, Ala., has been requested by a number of citizens of Fairfield to build a railway from Fairfield through several recent additions into Central Park. Such a line would save about 20 minutes time between Fairfield and Birmingham.

Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has taken another step to improve its right-of-way in Milwaukee, Wis. Considerable property has been purchased at Madison and Grove Streets. Residences on this line will be torn down to permit the removal of two curves at First Avenue and Madison Street, followed by another at Grove and Madison Streets. The tracks now in use will also be torn up, to be replaced by rails which will cross diagonally from Scott Street and First Avenue to Madison Street and Grove Street, eliminating the curves entirely. The improvement work will start shortly so that it will be completed by the middle of the summer. The improvement will cost $100,000. The Common Council must approve the plan.

Stockton Electric Railroad, Stockton, Cal., will commence work about April 1 on the extension of the Main Street line from its present terminal at Wilson Way 1 mile easterly to the city limits.

Capital Traction Company, Washington, D. C., plans to rebuild its tracks on M Street from 29th to 32d Street at a cost of $100,000. Work will start the end of March. The work will be done at the same time the District is widening and repaving the thoroughfare.

Power Houses, Shops and Buildings

Montreal Tramways, Montreal, Que., has ordered two 500-kw. rotary converters, with transformers, from the Canadian Westinghouse Company, and a switchboard for it from the General Electric Company for the St. Laurant substation, and two 1,000-kw. rotary converters, with transformers and switchboard, from the Canadian General Electric Company, for Hochelaga power house, and two 2,000-kw. rotary converters, with transformers and switchboard, from the Canadian General Electric Company, for its Mount Royal Avenue substation.

New York City, N. Y.—The Board of Transportation fixed April 2 for the receipt of bids for the construction of the inspection sheds of the Westchester and the Wakefield yards of the Pelham Bay Park and the White Plains Avenue branches of the Interborough subway in the Bronx.

New Advertising Literature

General Electric Company, Schenectady, N. Y., has issued "G. E. Welding Electrodes," a 16-page illustrated booklet describing the characteristics and applications of the three types of General Electric electrode, designated as types A, B and C. Brief instructions are included covering the use of each type.

Bridgeport Brass Company, Bridgeport, Conn., has issued data book No. 16, containing prices and weights of sheet brass, brass rod, wire, condenser tubes and seamless brass and copper tubes. Copies may be obtained gratis on application to the Bridgeport Brass Company.

Martindale Electric Company, Cleveland, Ohio, has issued catalog No. 6, entitled "Motor Maintenance Equipment." This shows apparatus for slotting commutators and cleaning lamination slots, and tools for grinding commutators.

National Paving Brick Manufacturers' Association, Cleveland, Ohio has issued three pamphlets on vitrified brick pavements. They are "Brick Roads Outlast the Bonds," "Brick Pavements, City Streets, County Highways" and "Making Brick Pavement." The material is available to those interested.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by Mc-Graw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Oklahoma City Has Only Itself to Blame

OFFICERS of the Oklahoma Railway, Oklahoma City, Okla., talked themselves hoarse in the past in an effort to prevent the calamity that threatened the railway. City officials and others were deaf to their pleas. Even the retail merchants opposed the reasonable parking provisions suggested by the company. Warnings meant nothing to them. The traction man who spoke in his own behalf could be seeking but one thing—to feather his own nest. Finally the inevitable happened. The railway went into the hands of receivers. The bondholders were for demanding their pound of flesh. As is very often the case, they favored summary action by immediate abandonment of unprofitable lines. That gave the people something to think about. Calamity had come home to them.

The receiver held the bondholders off until he could arrange for a report on the property from an outside source. This has now been made by George H. Clifford, manager of the Northern Texas Traction Company, Fort Worth, which won the Coffin award last year. The summary of his recommendations, printed elsewhere in this issue, speaks for itself. The ideas are excellent, but for many of them the company had pleaded without avail. The receiver has already been authorized to spend $100,000 for improvements. If he is permitted by the court to carry out Mr. Clifford's recommendations in full he will spend $202,500. The spending of this sum, however, is presaged on the assumption that the city will act to curtail practices distinctly unfair to the company. Mr. Clifford has left the city to itself to think things over.

Oklahoma City can be as well served with transportation as is Fort Worth. It will not be, however, unless it takes the lessons of recent months and the recommendations made in the expert's report seriously to heart. It needs to change its attitude. And it needs to do it quickly.

Some Editorial Writers Lose Sense of Proportion

BALAAM, perverse as he was and difficult to convince, made no bid for notoriety. Not so men who write poppycock for pay. The supposition is that any bid for notoriety is better than no bid at all and should be permitted to go unchallenged. Perhaps the worst offenses against reason are committed by papers like the Detroit *Free Press* that repeat the statement, referred to elsewhere in this issue at greater length: "That the trolley car as a means of transportation is already out of date is perfectly obvious." How do they reach that conclusion? Surely not by analysis which has any association with the dull process of reasoning. The statement does everything but square with the facts. But what are facts to the paper with a hammer out for the railways? Would the *Free Press* allow the statement to go uncontroverted that the newspaper is already out of date as a means of dissemination of information on account of the radio?

Says this writer of editorial balderdash: "We are convinced that if the main arteries . . . could be cleared of their tracks and an adequate number of buses substituted for the present trolley cars, the public would be more satisfactorily served." Really! Note the expression "an adequate number of buses"! It seems too bad to have to trample on sacerdotal folly.

The bus has its place, to be sure, but its place is not where this writer and many others like him suppose it is. This can be proved by a little mental arithmetic. Pity is needed for the man who is not even cognizant of developments in his own city under his own eyes that contradict what he says. According to him, the city bought junk when it took over the city lines of Detroit. If it did, which is a question, then the men in Detroit who are responsible for handling the city's large investments are merely seeking to perpetuate the system by pouring millions of dollars into a property for which the junk was an outward evidence. If the instance of editorial thinking displayed at Detroit were an isolated one, it might be allowed to pass unnoticed. There are too many wizards with words victims of the bus bacillus of pathogenic propensity. That is the trouble. Optimism with respect to the bus is a delightful thing where it is not the result of ignorance.

Intensive Development Needed to Restore Detroit United Earnings

MORE than 600 miles of interurban railway passed under the jurisdiction of the court in the recent receivership action against the Detroit United Railway. Naturally the event provoked considerable discussion in financial circles. Now that it has happened, it is easy enough to say that the receivership was unavoidable. Figures tell the story. The net income in 1924 after depreciation, etc., was $152,384, as compared with $512,751 in 1923. These and other statistics included in the annual report, an abstract of which is published in this week's issue, are all points to ponder. They are significant, but they are not staggering. The receiver is optimistic of the future, and the bankers who handle the company's securities while concerned with the outcome are not distressed at the course events have taken.

Long before he died, Mr. Stevenson had laid down a comprehensive program for the development of the property. In this he had the consent of the bankers. It is, of course, unfortunate that greater progress has not been made toward the fulfillment of this program, but it was economically sound under the changed conditions of the property and it would seem that as soon

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as the impediments natural to the receivership have been removed the plans will be proceeded with aggressively. It will be recalled that there has been no default in the payment of bond interest or in meeting sinking fund requirements.

The controversy with the city over the purchase of the local lines in several years removed now, but it was not without its effect in the present instance in that it tended to dissipate the energy of the management by requiring it to direct its endeavors along unproductive lines. It was the duty of the management to protect the investment represented by the company's railway lines in the city, but it could hardly carry on successfully at the same time two dissimilar processes. Technically, the management has shown ability, but need exists for the development of greater merchandising sense. The tools for this work are all largely available. The physical equipment of track and line is good, there are many new cars, some fine auto coaches and good terminals. Much of the road is over a private right-of-way. Lack of diversity of industry is an inherent economic drawback to the territory in which the company operates, but there need be no great cause for concern even over this. There recently have been some rate readjustments in favor of the company. Others are required.

Developing New Sources of Revenue

ONE interurban electric railway operating out of a large mid-Western city has several important lines that for years have handled a good passenger business. Within recent times this traffic has fallen off due to conditions of competition, both from private automobiles and from buses, that are familiar to many. The same heavy cars have been used for nearly 20 years. Headways have not been changed materially. In fact, nothing has been done to make the public believe that there can be anything new in the way of its interurban service.

Another line reaching the same city stands in marked contrast. Even though it does not pass through territory that is so well built up, nor which has the same possibilities as the former system, this road in the past few years has been engaged in a program of modernization that has permeated into every department. When it became apparent that competition might affect passenger revenues adversely, new light-weight cars were bought. These were of a modern design and painted a distinctive color, so that it was not possible to confuse them with the old cars. Schedules were tightened up by eliminating delays as far as practicable. Limited and other special services were started.

Not content with improving its passenger service, this same road investigated carefully the possibilities of handling freight and express. Under the direction of a competent traffic manager with steam railroad experience, numerous plans were developed and put into practice for securing carload and less-than-carload business. So successful has this been that today the railway's track is taxed to its capacity.

The next move that is contemplated is the installation of buses for local business so as to relieve the track for high-speed limited service and also for freight. It is claimed that this will permit a still further increase in the revenues of the railway and give it a wider field of usefulness.

Nothing could illustrate more clearly than this comparison the differences that often exist between managements and their methods. Even though the electric railway industry is today in an excellent financial condition there are properties which are not going ahead, not moving along with other developments in the industrial field, not even holding their own, but are drifting. While such a policy of stagnation may get by for a time, sooner or later it will lead to failure. It is well for each management to take stock and see if the property is among the leaders, and if not, how it can be placed with them.

Chambers of Commerce Constructive Aids to Better Transportation Conditions

THE placing in nomination of Philip H. Gadsden of Philadelphia to succeed himself as a director of the Chamber of Commerce of the United States is encouraging to those who consider transportation one of the important matters before the national chamber. Since Mr. Gadsden has been a director of the chamber, he has been most active in endeavoring to secure through it a broad answer to the most acute transportation questions now before the country. This is instanced particularly by the five committees appointed by the chamber about two years ago to study all the principal phases of the transportation problem. Mr. Gadsden was a member of the committee on "Relation of Highways and Motor Transport to Other Transportation Agencies" and of the sub-committee on "Taxation," and the reports of these committees, published in November, 1923, did much to develop the idea of the co-ordination of agencies, which today is accepted as desirable. Other important aid given by him to transportation matters outside of offices which he has held with the American Electric Railway Association have been as chairman of the National Committee on Public Utility Conditions during the war and as a member of the Federal Electric Railways Commission. Though much progress has been made during the last few years in settling electric railway and allied local transportation problems, much remains still to be done, and a great deal of it can best be undertaken on a national basis. The interest taken by the Department of Commerce in highway traffic and safety is symptomatic of this. With Mr. Gadsden re-elected a director of the national chamber its continued interest in transportation matters is assured.

This occasion should not pass without a plea to railway managers to take an active interest in their local chambers of commerce and boards of trade. These organizations are unique among civic bodies in that they represent primarily the active business man of the community. Hence their members are apt to be well representative of those who will look upon local transportation from a business standpoint and to realize the close relation which good transportation has with business prosperity. They are therefore not only likely to be sympathetic with any improvement in local transportation, but their positions on such matters should carry great weight. In other words, they are the natural allies of the local railway company if they understand its problems, and any railway manager who neglects this opportunity for assistance from his local chamber is not doing all he should for his company and the industry.

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Financing Rapid Transit Facilities

Special Assessment Against Benefited Property Is Advocated as an Equitable Method Under Modern Conditions of Financing Rapid Transit Construction — Examples Are Cited to Show that the Unearned Increase in Property Values Is Sufficient to Pay a Large Part of the Cost of Rapid Transit Facilities

*By C. E. Smith**
Consulting Engineer, St. Louis, Mo.

THE construction of transit facilities needed to meet the traffic requirements of a large and rapidly growing city calls for the investment of money at an ever-increasing rate, and the financing of this capital outlay and the return thereon form the nub of the transit problem of today. This conclusion was recently reached by the special rapid transit committee of the St. Louis Board of Aldermen which was engaged in a study of the possibilities for rapid transit in that city.

The immense sums of money required for rapid transit construction and the unwillingness of the public to grant franchises to private companies for a sufficiently long period to justify the investment of private capital for such purposes have led to the investment of public funds for that purpose during the last 30 years.

Although all of the original elevated railroads in New York City, Chicago, Boston and Philadelphia, and also the Market Street subway in Philadelphia and the Cambridge subway of the Boston Elevated were built with private funds, the expenditures made by public utility companies for this purpose were small compared with present-day costs of rapid transit construction. Consequently the practice of carrying out subsequent construction with public funds has been followed quite generally, and has become the adopted policy. This is also the announced policy of a number of other cities, including Chicago, Detroit, St. Louis and Los Angeles.

Several Ways of Financing Public Construction

Public funds may be used for rapid transit construction under one or more of the following plans:

1. By the sale of bonds, the fares being made high enough to pay interest and sinking fund charges in addition to all other costs of operation.
2. By the sale of bonds, the interest and sinking fund to be paid out of general funds of the city, and collected from the taxpayers in the general tax rate.
3. By assessing part or all of the construction cost against specially benefited property.

The first method has been rigidly adhered to in Boston, where part of the subways were built with public funds and leased to an operating company at a rental consisting of interest and sinking fund on the bonds and the cost of maintenance. Partly by reason of the carrying charges of the rapid transit facilities, (part of which had been paid for by public funds and part by private funds), partly by reason of the duplication of surface and rapid transit service, partly from automobile competition but principally to the increased level of operating costs, the issue was squarely presented there as to whether the subway rentals would be waived and collected from the taxpayers in order to hold fares down, or whether the fare would be raised to a point high enough to carry all of the increased costs and continue the payment of the subway rentals. The matter was decided in favor of the latter method. Fares were raised to 10 cents except for short rides in suburban districts which now cost 6 cents, making the average fare about 9 cents. This has been sufficient to pay the entire cost of service, including the subway rentals.

Fixed Charges from Taxes in New York

Assessment of subway rentals against the taxpayer has come about from force of circumstances in New York City. There, under the original lease (contract No. 1), the same arrangement was put in effect as at Boston. The first subway, including some elevated line, was built by the city and leased to the operating companies at a rental covering interest and sinking fund on the bonds, and maintenance. For several years after that arrangement went into effect, the 5-cent fare was adequate to pay all costs of operation, including the rapid transit rentals, but with rising costs it became necessary either to raise the fare above 5 cents, or for the city to give up the subway rentals which the operating companies could not pay out of a 5-cent fare. Contract No. 2 for a short extension was on the same basis.†

The companies sought to increase the fare, but the city successfully resisted these efforts, by reason of the peculiar contractual relations between the companies and the city, and for several years has not received rentals on the greater part of the rapid transit facilities. It has continued to receive rentals for the first group of rapid transit facilities that cost the city approximately $65,000,000, but has not for several years received rentals for the second group of rapid transit facilities that cost the city approximately $250,000,000. The result has been that the city has charged the taxpayer approximately $70,000,000 for interest and sinking fund charges on rapid transit bonds, in order to help keep the fare down.

In Philadelphia, public funds have been used for the

*The author is consulting engineer for the city of St. Louis, and the conclusions presented here were included in a progress report of a special committee of the St. Louis Board of Aldermen which has been studying rapid transit facilities for that city.

†The city's investment under contracts Nos. 1 and 2 was about $60,000,000, on which the leasing company (the Interborough Rapid Transit Company) pays 5 per cent for interest and 1 per cent for sinking fund.

In March, 1913, the so-called "dual" contracts or contracts Nos. 3 and 4 were made with the two companies in New York for extensions to the existing rapid transit systems. The terms of these contracts were quite different from those of contracts 1 and 2. Briefly, these contracts provided that the operating revenues should be devoted, first, to the payment of rent, taxes, operating expenses, maintenance and depreciation, then to the payment of 6 per cent for interest and sinking fund on the investment of the companies under these contracts, plus a certain agreed amount, based on the average annual income previously earned from the operation of their privately owned lines. If any surplus then remained it was to be devoted first to the payment of interest and sinking fund on the investment of the city, plus certain sums to correspond to those paid to the companies over and above the fixed charges on their new capital. Any further profit was to be divided. The earnings have never been sufficient after operating expenses, etc., to meet the companies' deductions, which have priority over the return on the city's investments.—EDITOR.

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construction of an elevated railroad, and are now being used for a comprehensive subway system. No part of the city subway system has been completed or placed in operation. An elevated railroad 6½ miles long built by the city has been leased to the operating company for a rental of 1 per cent the first year, 2 per cent the second year, 3 per cent the third year, 4 per cent the fourth year and 5 per cent the fifth year and thereafter. The interest and sinking fund on city bonds amount to more than 5 per cent. The difference between the amount the city has to pay and the amount it will receive from the operating company will be collected by general taxation and paid out of the city's general funds.

Assessing Cost on Benefited Property

The third method of assessing the cost of rapid transit construction by benefit assessments against specially benefited property has not yet been adopted to any considerable extent, although innumerable municipal improvement projects for the purpose of improving transportation have been carried out, and the cost has been paid by assessments against specially benefited property.

Notable among these is the Twin Peaks tunnel in San Francisco. Here a considerable settlement in a valley southwest of the city was separated from the city proper by a mountain about 1,000 ft. high, making access very difficult. A benefit district was formed, consisting of lands on both sides of the mountain, and a subway for street cars only, with two intermediate subway stations, was built through the mountain, length 2½ miles, cost $4,000,000, which was paid for by the Twin Peaks Tunnel Assessment District. The city street railway department spent $250,000 for construction of tracks and electrical equipment and provided cars.

According to City Engineer M. M. O'Shaughnessy, there were 4,813 acres in the assessment district, 4,153 acres on the side beyond the mountain, and 660 acres on the city side along Market Street. Distribution of the assessment was about $3,400,000 for the larger area, and $600,000 for the smaller area. It was paid in ten yearly installments, with deferred payments carrying 7 per cent interest. The work is all done now and the tunnel is paid for and everybody is happy.

The original rapid transit act of New York City (chapter 4 of the laws of 1891) was not specific in outlining the method by which the city could finance rapid transit facilities. Section 37 of that act was amended in 1911, to permit raising the cost of rapid transit facilities by benefit assessments against specially benefited property. Because in the beginning the 5-cent fare for the tremendous volume of traffic was sufficient to pay interest and sinking fund on rapid transit construction, little attention was given to this authorized method of financing by benefit assessments. With the increase in costs, the failure of the operating companies to pay the rapid transit rentals, and the necessity for the city to raise the interest and sinking fund by general taxation, the method of financing by benefit assessment has again come to the front.

The City Club of New York made a detail examination and analysis of the benefits that have resulted there as the result of rapid transit construction. It was found that as soon as the rapid transit program was announced and construction was begun, property along the rapid transit routes increased considerably in value. In some places where it was learned that stations would be located there was speculation in real estate and values increased rapidly. The increase has continued during the operation of the rapid transit routes.

In the borough of the Bronx the increase in land values along a rapid transit line 3.8 miles long was studied. For a strip 1 mile wide, one-half on each side of the rapid transit route, the value of the land before the route was announced amounted to $33,000,000. Seven years later, after the rapid transit facilities were in operation, the same land was valued at $78,000,000, an increase of 133 per cent. During that period the normal increase of land not adjoining the rapid transit route was 40 per cent. The remaining 93 per cent, about $30,000,000, of increase was undoubtedly due to the rapid transit facilities. As the length of this line was 3.8 miles, the increase in land values due to rapid transit over and above the normal increase in the same period amounted to more than $8,000,000 per mile of the rapid transit line. This portion of 3.8 miles was partly subway and partly elevated construction.

Another study was made by the City Club of a route in Manhattan Borough above 125th Street, length 4.4 miles, practically all subway. The total value of land for a strip 1 mile wide along this line was about $47,000,000 before the rapid transit line was announced. Seven years later, when the line was in operation, the land was valued at $116,000,000, an increase of nearly $70,000,000, or nearly 150 per cent. The normal increase of adjoining land in that vicinity was about 43 per cent. The extra increase due to rapid transit, in excess of the normal increase, amounted to more than 100 per cent, nearly $50,000,000, which, spread over the 4.4 miles of route, indicated an increase due to rapid transit alone of more than $11,000,000 per mile of rapid transit route.

On both these lines the increase in land values has continued at a more rapid rate than other lands not served by rapid transit routes.

Merchants to Pay Benefit Assessments

This subject has also been brought sharply to the front by the proposal of merchants along Sixth Avenue, New York, to have the city purchase the elevated railroad there, take it down, and install rapid transit subway; the merchants to pay benefit assessments equal to 10 per cent of the value of their properties. Roughly, this offer amounts to approximately one-half the cost of the improvement. It is thought that by taking more property into a benefit district the property assessments could be made to equal the entire cost.

In Detroit, constitutional debt limitations made it necessary for the city officials to direct their attention to other means of financing rapid transit facilities. The conclusion was reached that the entire cost of construction of the fixed improvements consisting of subways and elevated lines should be assessed against specially benefited property, and that the rolling equipment, the tracks, the electrification, substations, etc., should be provided by the operating company. This method of financing was submitted to the voters in an election during September, 1924, and was approved by a vote of nearly four to one.

There is no doubt whatever that rapid transit increases the value of property located convenient to rapid transit routes, and there seems no good reason in equity why the owner of such property and the recipient of such benefits should not pay toward the cost of the rapid transit facilities some part of his

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unearned increment in value. The benefit is considerably greater at the entrances and exits of rapid transit stations than at points a greater distance away, but increased property values can be detected more than ½ mile away from the stations. The increase in property values amounts to more around stations in congested districts, where tremendous numbers of people pass, than at outlying stations where the people are fewer. Particularly is this true of downtown department stores, office buildings, hotels, theaters and other such institutions that have direct connections with rapid transit stations.

The conclusion that was reached in Detroit that the cost of construction of the fixed improvements should be paid for by benefit assessments against specially benefited property, and the cost of electrification, the tracks and the cars should be provided by the operating company and supported by the fare paid, seems a reasonable division of the cost, and we are ready to recommend that division for serious consideration at St. Louis.

At first thought it might appear that by this method private property owners would be providing facilities for the enjoyment of public utility companies. This is not true, as the public utility companies would not be permitted to charge anything for the use of the rapid transit facilities, nor would the car rider be compelled to contribute through his fares to the cost; the fares would carry only the maintenance of the facilities. The principle of furnishing rapid transit facilities for rapidly and safely moving the population of a large city is not essentially different from that of furnishing streets. Street widening and street openings are largely paid for by benefit assessments against specially benefited property, and the users of the streets are not charged anything for their use except the cost of their upkeep.

The problem is not essentially different when facilities are provided for a certain kind of traffic, such as electric car traffic. It is fully established that cities have the right to restrict the use of certain streets and boulevards to certain types and kinds of vehicles, and to control the traffic in any street and otherwise to exercise their police power for the general welfare. Essentially the only difference between a rapid transit route and a surface street, on either of which tracks may be laid and cars operated, is that the rapid transit route is usually at another level than the usual street surface, but that merely indicates that present-day traffic problems require us to think beyond the two dimensions of width and length, and consider now the third dimension—height.

The Michigan Boulevard Link Bridge and the South Water Street improvement under way in Chicago are good illustrations of this. There Michigan Avenue has been double-decked and South Water Street is about to be double-decked. The cost of the double level for the handling of traffic, restricted against truck traffic on the upper level and practically devoted to truck traffic on the lower level, is being paid for partly by the city direct and partly by benefit assessments against specially benefited property.

Highways have been provided at the expense of the public from the very earliest days. In some instances where the public did not provide enough of them, toll roads were provided by private capital, but practically all toll roads have been absorbed by the public. Until the day of the railroad, all the traveling public was ever called upon to furnish was the conveyance and the means of locomotion. This principle held even when omnibuses and stage coaches were operated, but with the advent of the street railways, requiring rails, the cable railway requiring underground construction, and the electric railway requiring tracks and trolley wires, the companies engaged in that service were not required to provide their own streets, but merely to pay for the construction in them made necessary by their operation, and to provide their moving equipment.

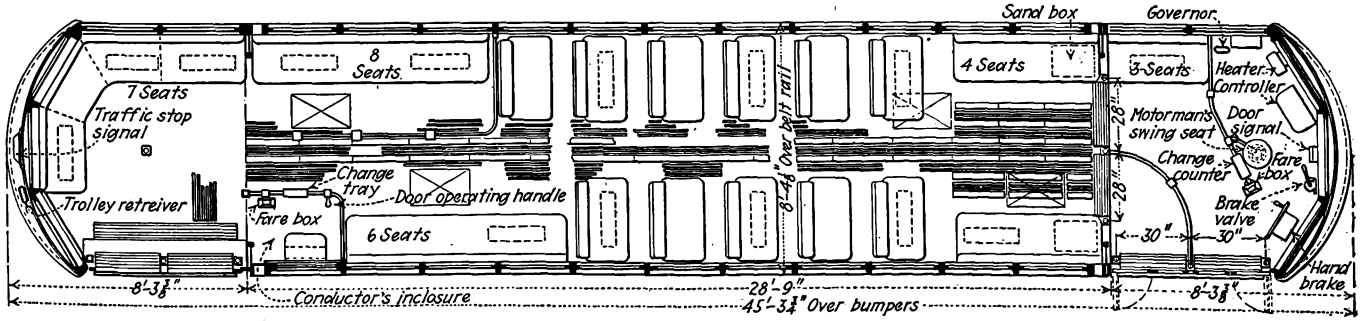
Similarly it would seem logical, now that the public cannot be transported satisfactorily on streets furnished by the public, for the public in its own interest to provide another roadway level separate from present levels, on which the operating company would provide such tracks, electrical equipment and cars as would be necessary for handling the traffic. Of course, facilities provided from benefit assessments against specially benefited property should be just as free for use as the streets, and no additional charge should be included in the fare for the use of such facilities.

"Near-Side" Cars Operated in Ottawa

New One-Man, Two-Man Cars of the Ottawa Electric Railway Are Arranged for Front-Entrance and Pay-Leave Operation—Red Light on Front Dasher Gives Warning When Car Is About to Start

WITH the introduction of 20 new double-truck, front-entrance motor cars by the railway, the near-side stop has been adopted in Ottawa, Ont. The new cars are of the single-end type and may be operated by either one man or two men. Passengers enter at the front and leave at the rear. With two-man operation the pay-as-you-leave plan of fare collection is used, while fares are collected pay-enter with one-man operation.

With two-man operation the conductor's position is just to the front of the rear doors. Aluminum railings,



Floor Plan of Double-Truck, Single-End Motor Car for Ottawa Electric Railway

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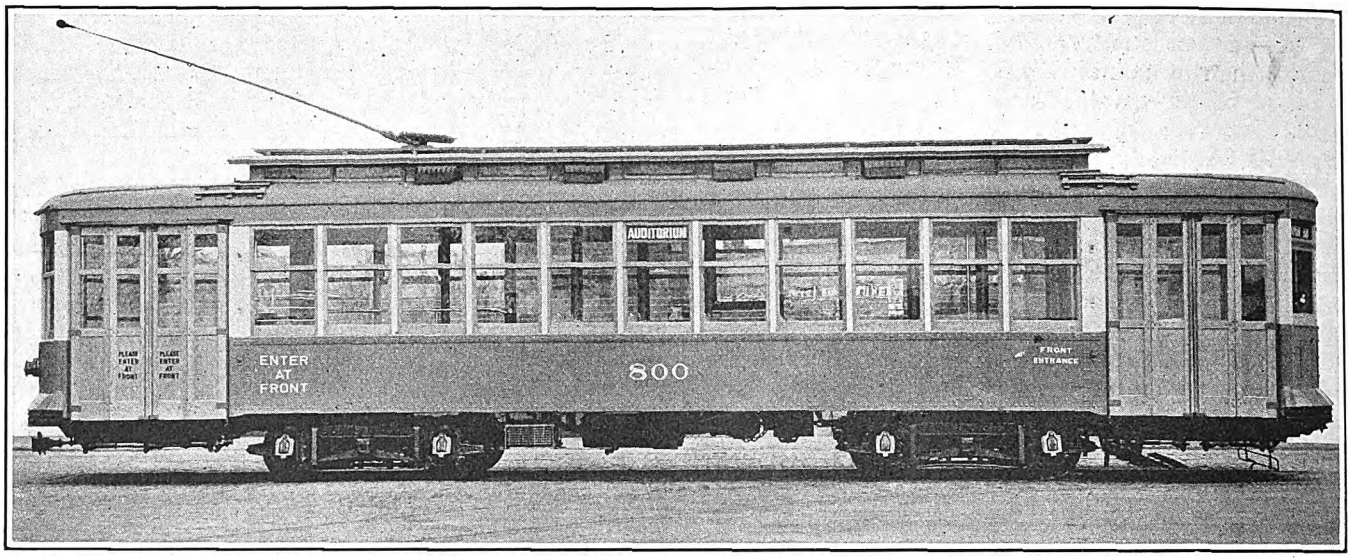


These Cars Are Arranged for Front-Entrance, Rear-Exit Operation

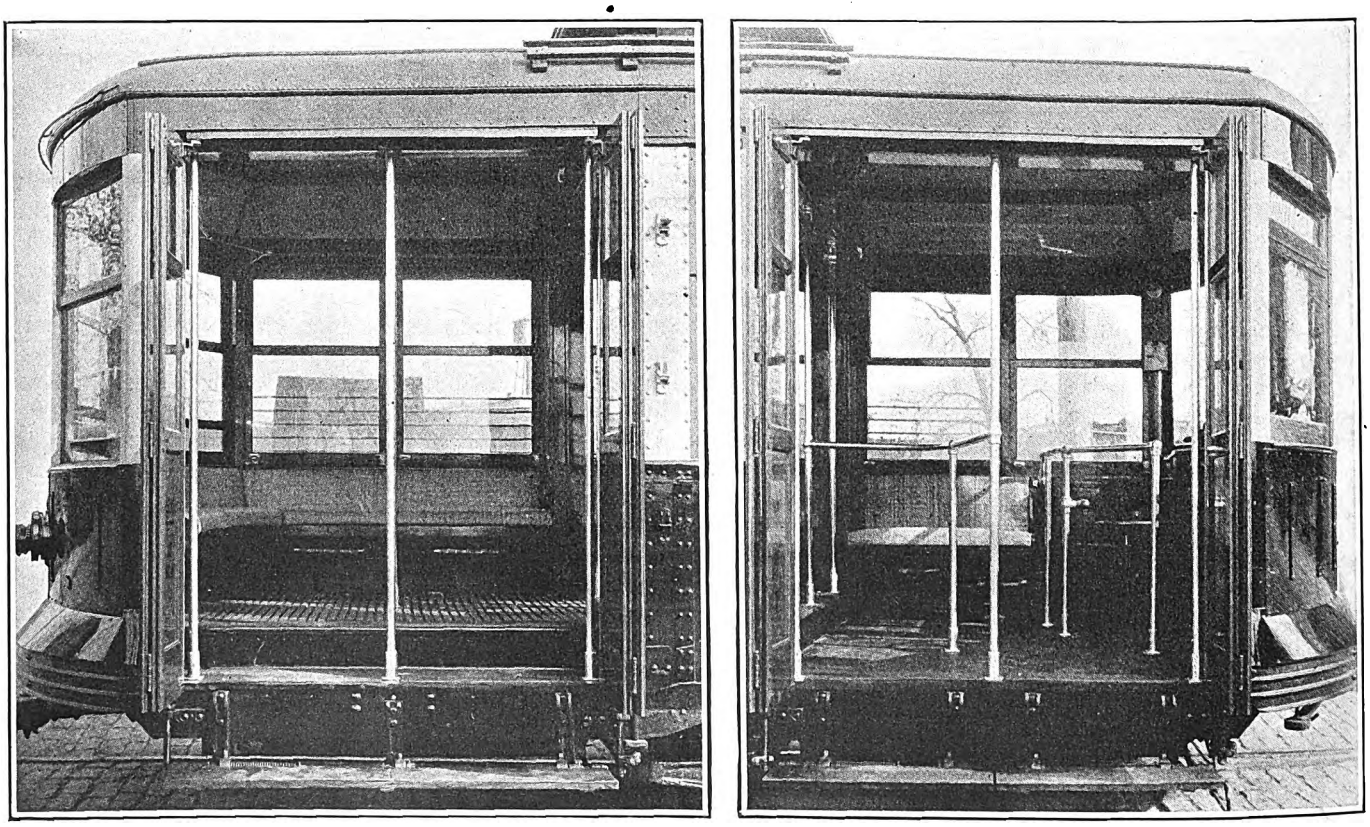
foot rest and a change tray are provided, together with a transfer and supply box below the tray.

Car bodies are of all steel construction, with monitor type roof. They have a length over all of 45 ft. 3¾ in., a seating capacity of 52 and weigh completely equipped, but without load, 38,750 lb. The front end of the cars has longitudinal seats for 11 passengers. Ten cross-seats are provided in the center of the car, and the rear has longitudinal seats which continue around the rear vestibule end. The rear vestibule floor is on the same level as the car body floor. One step is provided just inside the doors. The front platform is lower than the car body floor and there is a single step at what would nominally be the bulkhead.

Seats are upholstered in rattan and the car interior is finished in cherry with Panelite headlining. In order to distinguish the new cars from the old, they are painted red, while the older equipment of this company in painted green.

Doors are interlocked electrically with the car control. Signal equipment includes a light in front of the motorman's position and red and green signal lights at the rear. A new feature will be an arrangement by which the motorman's signal light shows forward through a red lens, to warn people in front of the car that it is about to start. This light is thus located just above the front window sill.

The cars were built by the Ottawa Car Manufacturing Company and the trucks were supplied by the Canadian Car & Foundry Company. Additional details of the car dimensions and equipment were published in the ELECTRIC RAILWAY JOURNAL for May 17, 1924.



Entrance and Exit Arrangement. At Left—Exit with One Step Inside Car and Double Folding Step. At Right—Front Entrance with Double Folding Step

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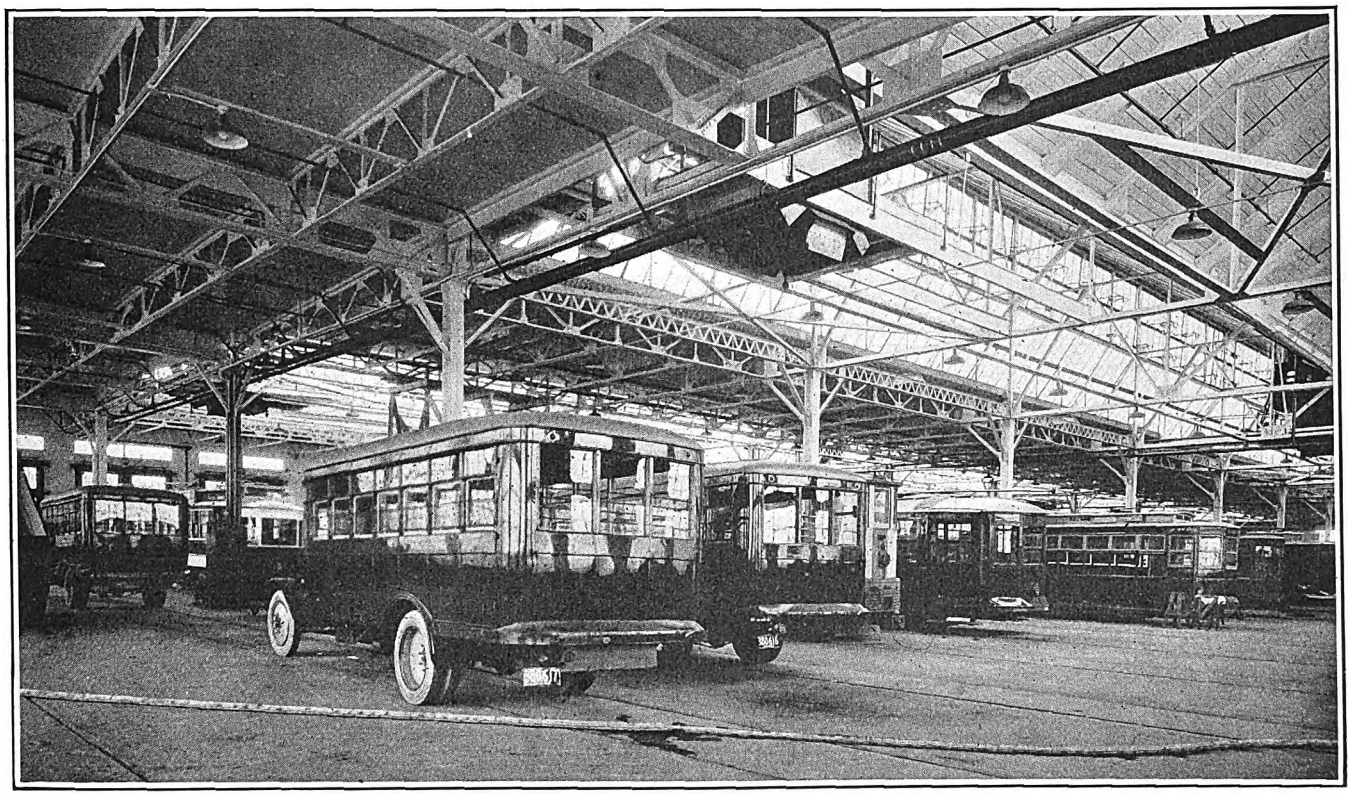
Wiring and Fire Protection at Everett

*Fifth Article**

Ring Feeds from Outside Wood Mill and Paint Shop Provide Flexible Electric Service at Boston Elevated Shops—Careful Study of Shop Lighting Preceded Installation—Well-Developed Sprinkler and Hose Service System Used with Alert and Trained Squads



Lighting Arrangement in Paint Shop

THE electrical distribution system of the new Everett shops of the Boston Elevated Railway has been planned particularly so as to provide for continuity of service and to keep the working areas of the shops unhampered by the wiring system.

The main substation, where the incoming lines enter, is at one side of the paint shop, as shown in the illustrations. From this point four cables are run in a tunnel to the near side of the paint shop, whence the circuits branch to the ends to serve the wood mill and dry kiln. These four cables are each No. 000 and lead-covered. One power service cable is run from the tunnel outlet at the paint shop around the south side of the paint shop and wood mill and thence along the west side of the latter and into a safety-front switchboard near the wood mill stockroom (shown on page 873, issue of Nov. 22, 1924). The other power cable passes around the north side of the shops and terminates at the dead-front board just mentioned. In case either cable fails the other will care for the local power load.

All power service is handled at 550 volts, while the lighting current is stepped down to 110/220 volts through transformers located in the paint shop basement, outside the paint shop and wood mill walls on reinforced-concrete platforms a few inches above the ground level, and in the basement of the dry kiln. These transformers are fed by the 550-volt cables. The secondary circuits are carried from the transformers to main switch panels, from which local lighting distribution cabinets are fed.

One lighting service cable runs around the north side of the shops to the southwest corner of the wood mill. Another is carried around the south end of the paint shop to the dry kiln. Taps from the lighting cables are also carried into the paint shop to serve local lighting transformers mounted in the basement. The three phases are balanced as evenly as possible.

Taps from the power cables are run to a switchboard in the east central portion of the paint shop, from which the local feeds are run to the motors in the paint stock room, to elevator motors controlled by Condit remote-operated switches, to skylight motors and to all fuses of paint stock room motors. These latter are outside the stock room for increased fire protection. The solid neutral has been installed in all lighting service and distributing panel boxes. All service switches for lighting are Westinghouse-Krantz fused, two-pole, safety-inclosed auto-lock units, and power switches are three-pole units of the same make. For

*Previous articles on the new Everett shops of the Boston Elevated Railway were published in ELECTRIC RAILWAY JOURNAL for Nov. 22, Dec. 13, Dec. 27 and Jan. 31.

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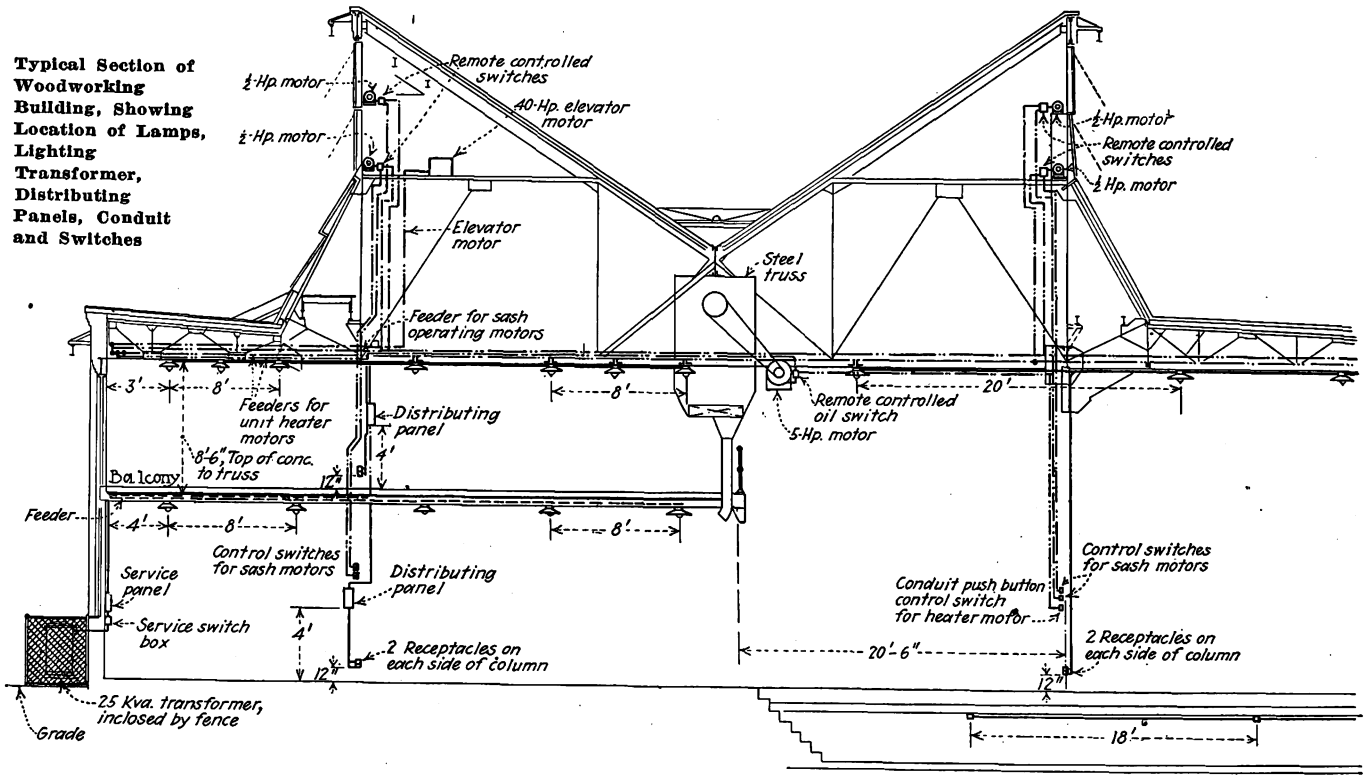
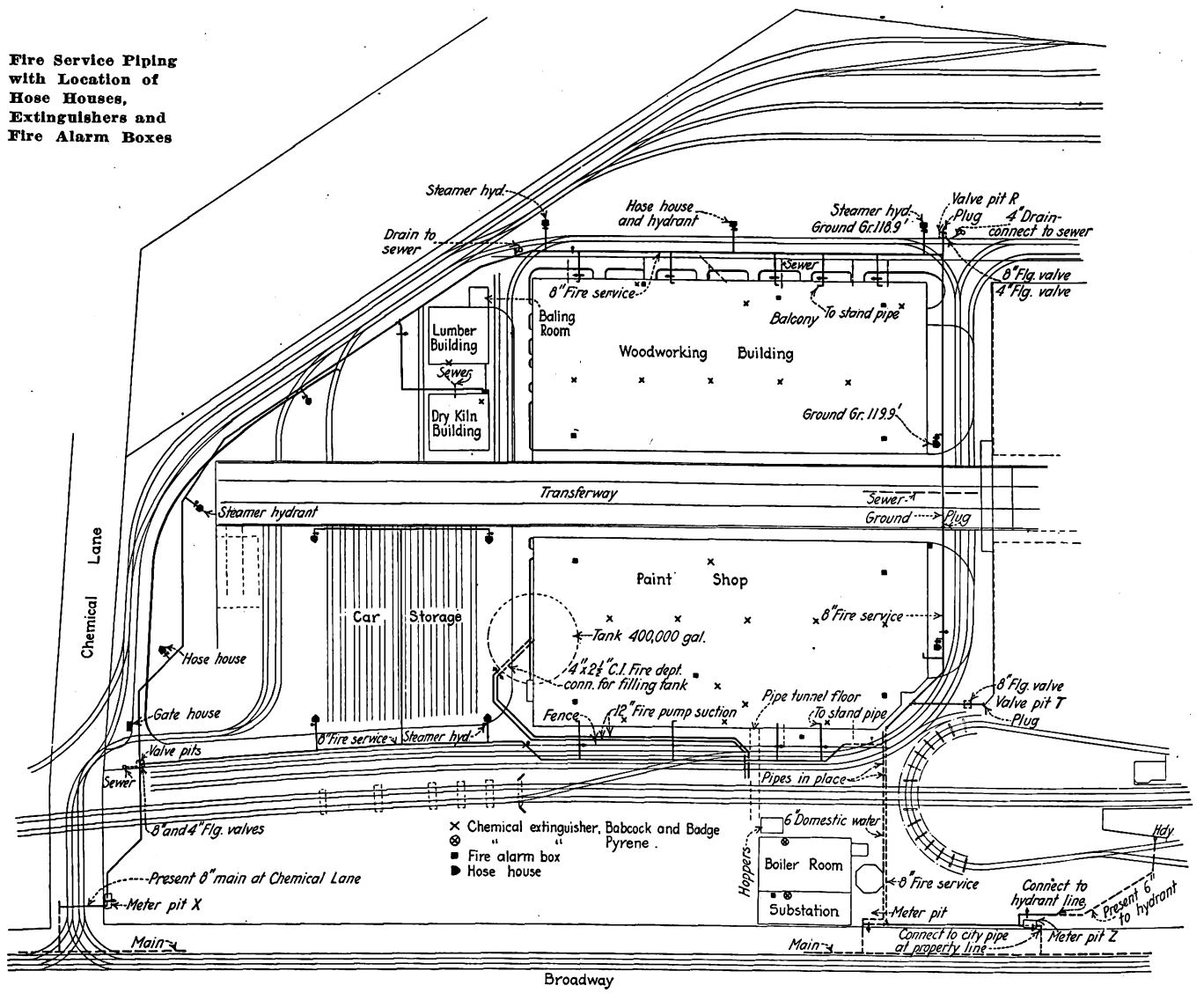
Typical Section of Woodworking Building, Showing Location of Lamps, Lighting Transformer, Distributing Panels, Conduit and Switches



Fire Service Piping with Location of Hose Houses, Extinguishers and Fire Alarm Boxes



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lighting, feeder panels are two-wire Westinghouse-Krantz safety auto-lock control panels mounted in steel service boxes, with two-wire branch circuits equipped with fuse and switch.

Before the lighting installation was made, Jackson & Moreland, engineers, Boston, made a study of illumination in six electric railway shops in the East and Middle West and worked out the local requirements at Everett on the basis of a comprehensive analysis of the problems of the Boston company. The accompanying table gives the foot-candle intensities decided upon and realized in the Everett shops, perhaps the most difficult determination being the intensities desirable and practicable on the sides of car bodies standing in the paint and repair shops.

LIGHTING INTENSITIES ADOPTED IN EVERETT CAR SHOPS, BOSTON ELEVATED RAILWAY

Paint Shop

Locations	Foot-Candles*	Locations	Foot-Candles*
†Main floor	10	Rest room	8
Glass storage	4.5	General offices	9
Paint room	8	Accident room	11
Toilets, lockers and washrooms	5 to 6	Sign painting	11
		Stairways and passages	4

Wood-working Shop

Locations	Foot-Candles*	Locations	Foot-Candles*
†Main floor	10	Toilets, lockers and washrooms	5 to 6
Milling section	9	Cabinet and upholstery section	8
Sash and door section	12		
Stock rooms	5.5		

Lumber Storage

Locations	Foot-Candles*	Locations	Foot-Candles*
First floor	3	Baling	3
Center aisle	6.5	Baling room	5

Dry Kiln

Locations	Foot-Candles*	Locations	Foot-Candles*
Drying and equipment section	3-4	First and second floor storage areas	3

Yards

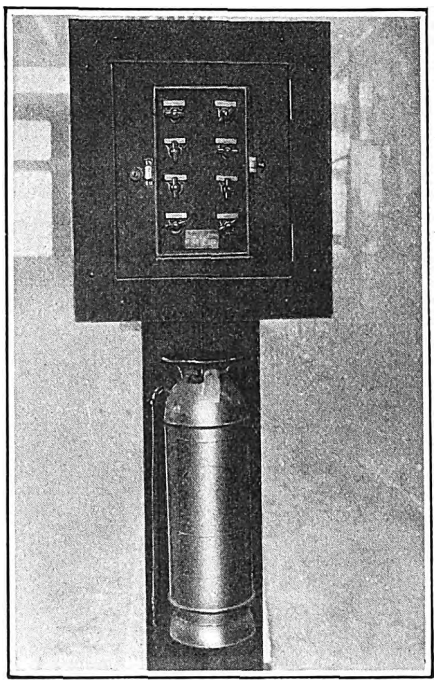
Locations	Foot-Candles*	Locations	Foot-Candles*
General yard	0.03 to 0.07	About buildings	0.05 to 0.08

*The working plane for all foot-candle measurements for interior lighting was taken at 2 ft. 6 in. above the floor and for yard lighting at 1 ft.

†The main floor units are so placed and selected that the intensity of illumination on the sides of car bodies for painting and repairs varies from an average of 12-ft.-candles at the car eaves to 2-ft. candles at the bottom of the body.

In general the paint shop and wood mill interiors are lighted by 500-watt Mazda C lamps, spaced 16 ft. x 20 ft. apart and equipped with Mogul sockets and 20-in. Westinghouse RLM reflectors. The lamps, between each pair of tracks, are in general three per circuit, mounted on roof trusses at a height of 20 ft. above the floor, and are controlled from switch cabinets located on the columns and in some cases on adjacent walls. Inside lighting for car painting is furnished by the car lighting units or by portables with heavy-duty cords attached. Pits in the wood mill are equipped with plug outlets for portable lamps. Supplementary angle lights are installed on the shop walls and a widespread use of 100-watt lamps is made on the wood mill balcony. Including yard lamps, 1,002 lamps are now in service at Everett, and 458 base plugs are provided on the walls and columns, all wiring being in rigid conduit.

The yard lighting is by 500-watt lamps, mounted some 20 ft. above ground on poles or wall brackets, as the case demands, and these lamps are divided into two groups of circuits controlled from the interior of the paint shop and wood mill and supplied from local transformers in these buildings or immediately outside.



Lighting Switch Cabinet with Fire Extinguisher Underneath

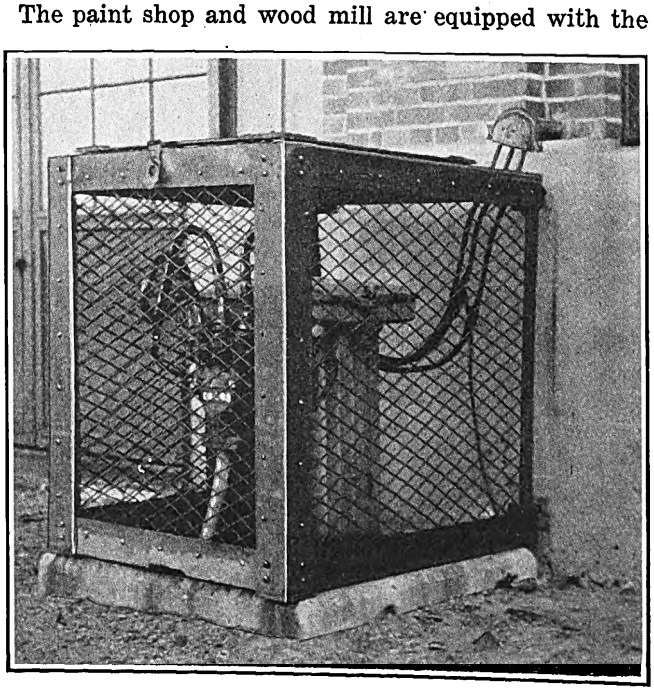
The Westinghouse-Cutter type CI "Luxsolite" fixture is used with 20-in. reflector and 8½-in. skirted refractor.

The lumber storage building is illuminated by two 50-watt lamps per compartment, on both the ground floor and balcony sections. An additional row of lamps is placed under each walkway. In the central light shaft of this building three 300-watt lamps are mounted at the top of the opening under the trusses. All lamps used in this building are heavily guarded against mechanical injury. Snap switches at entrances of the compartments on each level control the interior lamps.

In the dry kiln there are twelve 75-watt lamps mounted 12 ft. above the floor and provided with guarded reflectors. These lamps are wired in two circuits through concealed conduit. They are controlled from a distribution cabinet outside the drying room. In general the kiln room lamps are spaced on 8-ft. 5-in. x 10-ft. 6-in. centers. In the paint stockroom 150-watt lamps spaced on 10-ft. centers are standard.

In each of the two larger buildings a watchman's circuit of twenty 300-watt lamps is provided, controlled from special cabinets on the floor. The total connected lighting load of the buildings at present aggregates 250 kw.

The paint shop and wood mill are equipped with the



Lighting Transformer with Screening and Concrete Base at Entrance to Wood Mill

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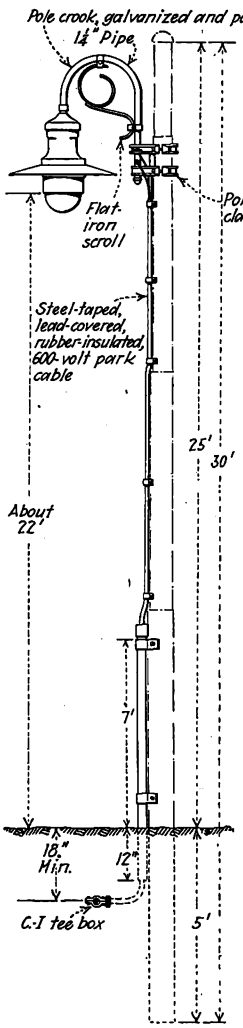
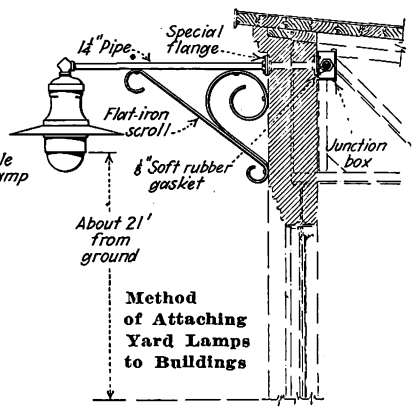
wet-pipe system of sprinkler protection, 966 heads being installed in the former and 956 in the latter. The lumber storage building and dry kiln are piped for the dry-pipe system, with 68 and 70 heads respectively. An 8-in. city fire service main completely surrounds the shops. This main connects at the north and south ends of the property with a 24-in., 55-lb. street main on the Broadway side. A cross connection from the gate-house on Chemical Lane to the northeast end of the paint shop completes the 8-in. loop around the buildings. Six-inch branch pipes lead at intervals into the buildings from the looped main, and the usual system of alarm valves is provided at the standpipe connections within the building. The alarm valves are equipped with annunciator connections to indicate the section where an opening occurs, as is usual practice. A five-drop annunciator is located on the side of the balcony in the wood mill and a similar four-drop annunciator is mounted on the side of the paint shop balcony.



Type of Lamp Post Used in Yard Lighting

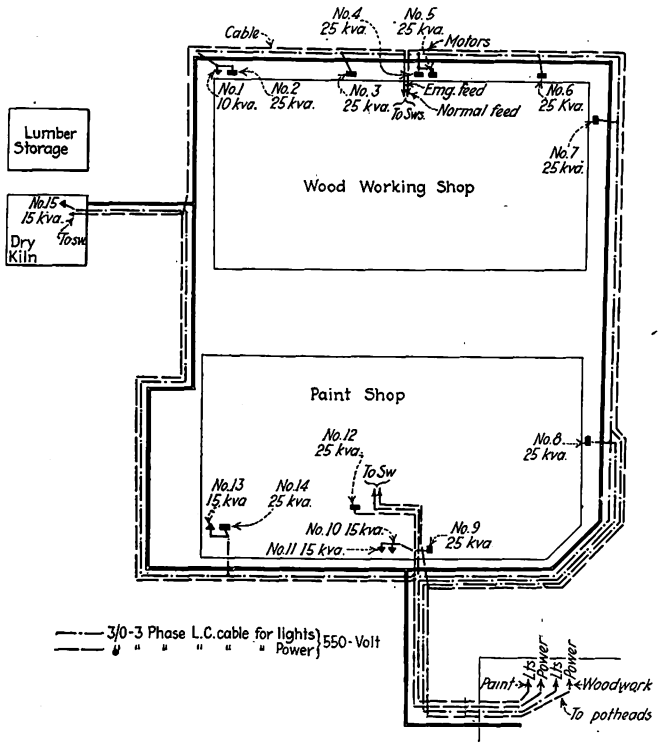


Method of Attaching Yard Lamps to Buildings

Standpipe Valves Outside of Shop Are Protected from Mechanical Injury

On the site of the paint shop was formerly located a 400,000-gal. fuel oil tank which straddled the south end wall of the paint shop. As the underwriters required the plant to have an auxiliary water supply it was decided to utilize this tank for the purpose. This was done by removing the top, which was of flat plate construction, lowering the grades of the sidewalks and partitions and installing concrete construction to carry tracks in the building and yard. Two 12-in. suction pipe lines from this tank run into the boiler house, where a 1,000-gal. per minute, single-stage, centrifugal, combined motor and steam-turbine driven fire pump is installed. This pump will deliver water at 125 lb. per square inch and will be augmented by another pump which will use one of the two foregoing suction lines from the tank when the shops are extended. The tank is filled either from a hydrant connection in the yard or from the standpipe system in the shops, as desired. Four hose outlets are installed on the outside of the boiler house and throughout the yard are twelve hose houses, four on the north side of the wood mill, one on the north side of the paint shop and the rest in the southerly end of the yard in the vicinity of the car storage tracks and lumber storage.

On the roofs of the wood mill and paint shop are warmed inclosures carrying hose outlets with long-handled valves which are operated from outside. The hose runs are coiled on portable frames which can be quickly pulled out of the house over rollers and dropped upon the flat roof section for convenience in serving the different portions of the roof. Another convenience which is designed to prevent rotting out the hose piping in the standpipes inside the buildings is the use of a small ball valve with drip pipe outlet upon the floor at the standpipe. The ball closes the drip valve outlet when more than nominal pressure is applied, but permits the escape of leaking water when the pressure is insufficient to lift the ball off its seat. All alarm valves and standpipe risers are equipped with 6-in. insulating joints. The sprinkler system was installed by C. H. Cronan, Boston.



Light and Power Cable Runs from Substation to Shops

Fourteen squads of six men each are organized for fire fighting in the paint shop and the same number in the woodworking building. Four similar squads also care for yard fire fighting. In general the squads each are headed by a chief under whom are two hosemen, one nozzle man and two valvemen. Fifteen Gamewell fire alarm boxes with auxiliary whistle signal and connections with the Malden fire alarm signal system are in service in the shops and yard. There is also a special city box at the gate house. The shops are provided

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with a Western Electric interior communicating telephone system. H. G. Noble is superintendent of the Everett shops and John Lindall superintendent of rolling stock and shops. Acknowledgments are due to A. J. Blackburn, architect of the maintenance department, and J. Walter Allen, electrical engineer of the company, for assistance in the preparation of this serial.

The substation and boiler house is large enough to meet the ultimate needs of the shops, and as new buildings are erected and equipped, the addition of another boiler battery, a frequency converter, a third high-tension cable and further switching, feeder and control equipment can readily be made. The electrical distribution system of the paint shop, wood mill and lumber buildings typifies that to be installed in the future metal-working shops. The future fire protection system is based upon extending the present connections with the city mains, pumping installation and piping on the property.

Selling the Philadelphia Stock Issue

LEAFLETS and car cards were used to advertise the issue of $3,000,000 or 7 per cent preferred stock of the Philadelphia Rapid Transit Company, recently sold to car riders. The result, as mentioned in the news columns of this paper on March 7, was that the issue was oversubscribed within less than a week from Feb. 22, when the stock was offered. Individual subscriptions were limited to ten shares and were accepted only from residents of the city. Altogether the company received applications from approximately 14,000 persons, representing more than 300 different occupations.

Applicants for stock were allowed to hand their subscriptions to any P. R. T. conductor or subway-elevated cashier on blanks distributed on the cars and in the stations. No cash payment was received. Instead, the company agreed to notify the subscriber when he should begin payment and he then might pay at the rate of $1 per share per week, or in full. No interest was charged for deferred payment.

The form of application blank is shown in the accompanying illustration. It was a part of a six-page folder of "Service Talks." The car cards and dash posters carried such statements as: "Invest in a Growing Concern, Buy P. R. T. Preferred Stock," "One Dollar Will Start You to Ownership in P. R. T.—*Service Talks* Tells How." The cards were changed after a three-day display, and each set with a different color. In a radio talk on Feb. 28, J. M. Shaw of the company announced that 30,000 subscriptions had been received for more than the entire issue. This fact was also carried on car cards, shown in the cars on March 1.

PHILADELPHIA RAPID TRANSIT COMPANY
Securities Department
1620 Spruce Street, Philadelphia.

I hereby make application to purchase _____ shares, when authorized, of 7% Cumulative Preferred Stock of Philadelphia Rapid Transit Co. at $50 per share, par value, for which I will pay as stated in Service Talks 85. (Mark cross at 1 or 2 as selected, viz: ☒)

(Not more than 10)

☐ 1. When notified, I shall begin payment of $1 per share per week to any P. R. T conductor or subway-elevated cashier

or

☐ 2. When notified, I shall pay $_____ in full and receive _____ shares.

(Print or write plainly)
Applicant's Name _____
Applicant's Occupation _____
Street and No. _____
City and State _____

I certify that the above applicant is a P R. T. car-rider:

Employe's Name _____ Badge No. _____

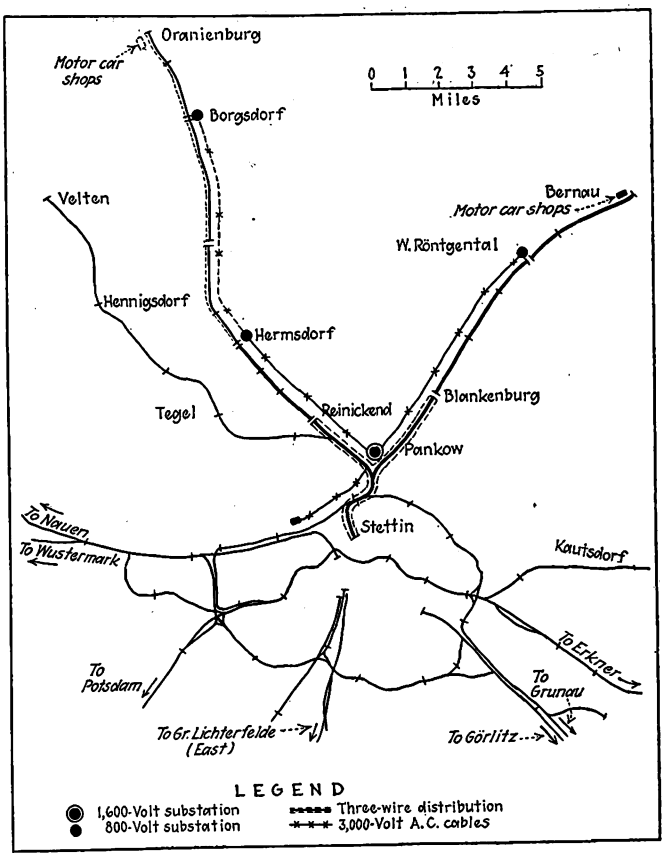
NOTE—Hand this card to any P. R. T. conductor or subway-elevated cashier, who will sign and turn it in to the company

Subscribers for P.R.T. Stock Used a Blank Like This

Berlin Suburban Electrification Put in Operation

Three-Wire Distribution Is Used for Busiest Section of 800-Volt Third-Rail Division—Train Units Are Made Up of a Motor Car and Two Trail Cars

THE first electrified section of the Berlin suburban lines, between the Stettin station (in northern Berlin) and Hermsdorf, was put in operation on Aug. 1 1924. The extension to Oranienburg will be in operation some time this year, to be followed by electrification of another branch from the same terminal to Tegel, Henningsdorf and Velten, according to Public Works Commissioner Gebauer, writing in *Verkehrstechnik*.



The Distribution of Electrical Energy to the New Berlin Suburban Electrification Is Partly at 800 Volts and Partly on the 800-1,600 Volt, Three-Wire System

Power for propulsion is delivered at 800 volts direct current. This was determined largely by the lower cost of d.c. motor cars. However, a third rail was chosen for conducting the energy owing to the likelihood that high-voltage alternating-current will eventually be used over the same tracks for trunk-line operation.

Energy is transmitted from the Berlin Electricity Works plant at Moabit at 30,000 volts, 50 cycles to the chief substation at Pankow, whence it is transmitted to the other substations shown on the map. Distribution from Pankow is on the three-wire principle, the third rail for one direction being served at 800 volts plus and the other at 800 volts minus. The running rails serve as neutrals. This balanced system was chosen to keep down electrolysis and reduce power losses.

The other sections use two-wire distribution because the loads come too infrequently to attempt balancing;

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and as they run through the outer districts, less elaborate precautions against electrolysis suffice.

The electrification plans figure a maximum train density of six per hour each way on the Bernau division and eight per hour on the Oranienburg division. Train weight empty was taken at 270 metric tons and train capacity as 1,500 passengers. The speed on the outer sections, based on a rate of acceleration of 0.3 meter per second per second, is 70 km. per hour (43.4 m.p.h.) maximum and 40 km. per hour (24.8 m.p.h.) average schedule on the basis of 1,900 m. (6,232 ft.) spacing between stations. This schedule is about 30 per cent faster than was used formerly with steam.

The substations contain the following equipment:

Station	Rotary Converters Number	Rotary Converters Capacity, Kw.	Rotary Converters Manufacturer	Total Station Capacity, Kw.
Pankow	3	2,000	Bergmann	6,000
Hermsdorf	3	1,500	A. E. G.	4,500
Röntgental	3	1,000	Brown-Boveri	3,000
Borgsdorf	3	1,500	Pöge	4,500

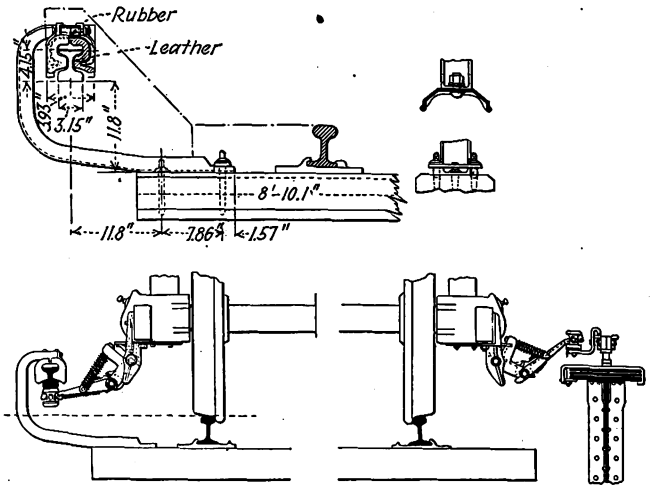
The under-contact third rail is used as a measure of safety. Because of the limited clearances the conductor is of the special type shown. Its weight is 40 kg. per meter (approximately 80 lb. per yard), its height only 105 mm. (4.15 in.) and its cross-section 5,100 sq.mm. A soft Krupp steel is used with high conductivity. Its resistance is 8.9 times that of copper. The construction permits additional conductivity to be obtained by adding strap aluminum or copper to the base of the rail.

The third-rail insulators have leather inserts between rail and insulator and insulator and cap for their mechanical protection; also rubber at the junction of the insulators to prevent the intrusion of water. These insulators are installed at intervals of 15 m. (49 ft.), the length of a third-rail section.

For the return circuit, the running rails have been fitted either with welded terminal flexible bonds or different kinds of galvanized contacts. Copper cross-bonds are installed at intervals of 150 m. (492 ft.).

Station lengths and limitations in loading and unloading time fixed the train length as 140 m. (459 ft.). Hence the chief improvements as regards capacity and speed of passenger interchange came through the adoption of sliding in place of swinging doors and a better arrangement of compartments.

For test purposes orders were placed for five different trial trains of like over-all dimensions and electrical equipment. Each train has halves about 70 m. (230 ft.) long. Each half train has four motors, two on each end truck. Since a weight of 17 metric tons per axle was required for most efficient motor use, the motor car had to be 20 m. long. This left 30 m. for the trailing portion. As that length was considered too great for a



An Under-Running Third Rail of Special Design Supplies the Electrical Power. The Shoes Are Also Adaptable to Over-Running Contact

body on standard four-wheel trucks and not enough for two cars on such trucks it was determined to use three two-axle 10 m. (32 ft. 9 in.) trailers to each motor car.

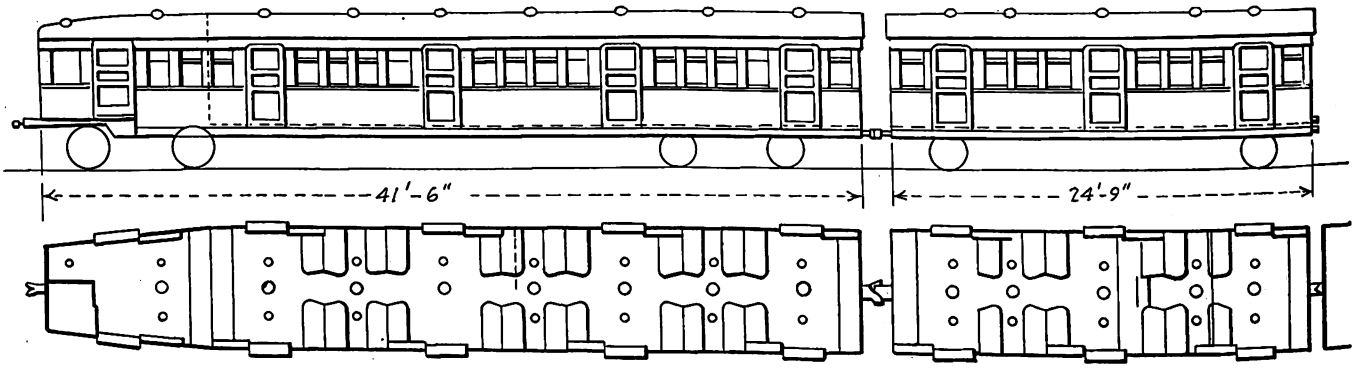
The use of 850-mm. (33-in.) wheels enables the passengers to step directly from the station platform 760 mm. (30 in.) high into the cars, except that 1,000-mm. (39-in. wheels) are necessary at the motor-truck ends. However, the portions over the trucks are used only for motorman's and baggage compartments.

The cars have steel frames with welded side sheathing, but the roof and interior are of wood.

Following trial of these trains, choice was made of the design shown in the accompanying plan. The motor car is 20 m. long, has five doors per side and seats 66 passengers. The trailer is 10 m. long, has three doors per side and seats 36 passengers. A complete train made up of these units seats 474, but has a carrying capacity of approximately 1,500. The weight of a motor car is 45 tons empty, of which the electrical equipment is 13.5 tons. The weight of a trailer is 15 tons.

It is intended, however, to go to four-motor cars later in connection with two trailers of greater length, so that the train make-up will have greater uniformity and there will be less gap between station platform and car body on curves than is now necessary with the extra long cars.

The present two-motor cars are fitted with two field-control motors rated at 230 hp. each at 630 r.p.m. on an hourly basis and 132 hp. each on continuous running. A gear and pinion drive is used on each side. Ball bearings have been definitely adopted for the armatures. while ball-bearing axle journals are on trial.



Train Units Are Made Up of Two Parts, Each of Which Consists of a Motor Car and Two Trailers

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Precast Concrete Paving

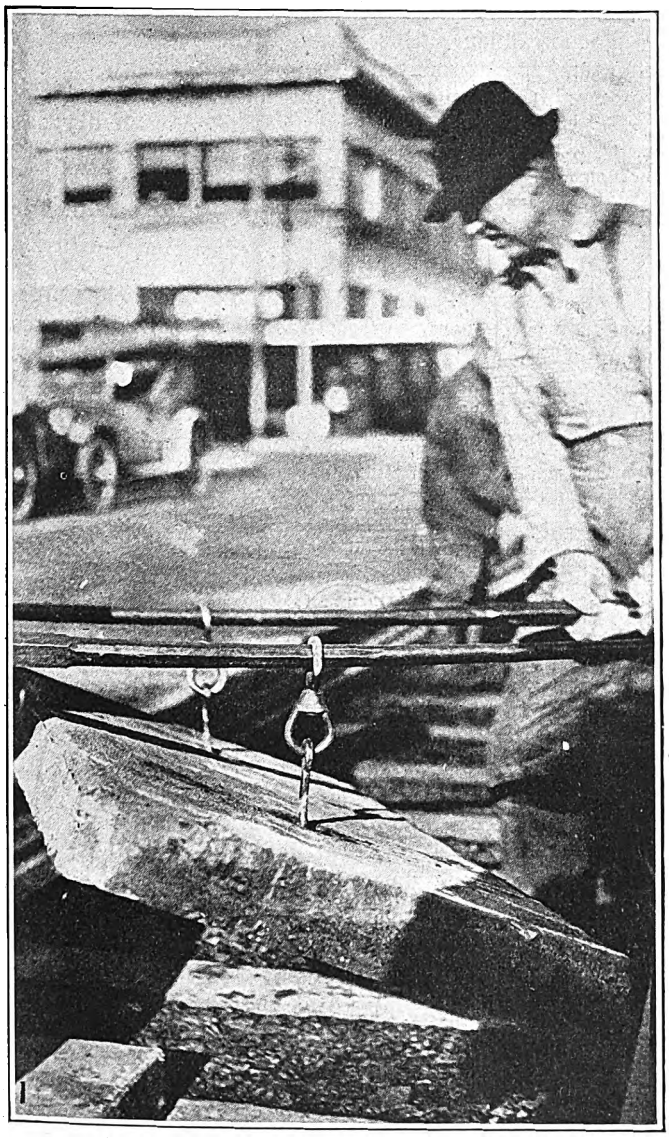
Reinforced Slabs Used by the Willapa Electric Company Permit Rapid Construction Without Interruption to Traffic—Paving Maintenance Costs Are Less —Noise of Operation Has Been Reduced

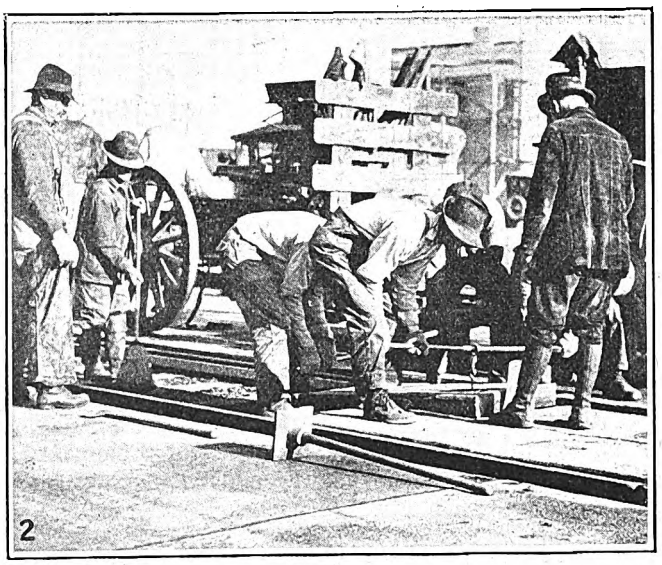
A METHOD of track construction using precast slabs of reinforced concrete for paving between and alongside the rails was tried recently by the Willapa Electric Company, Raymond, Wash. This experiment was made because the railway anticipated serious settlement on the streets where the paving was to be installed. It was thought that during the period of settlement paving of this type would be preferable to monolithic concrete. The new pavement has proved so satisfactory in this location that it is now planned to extend its use to other places.

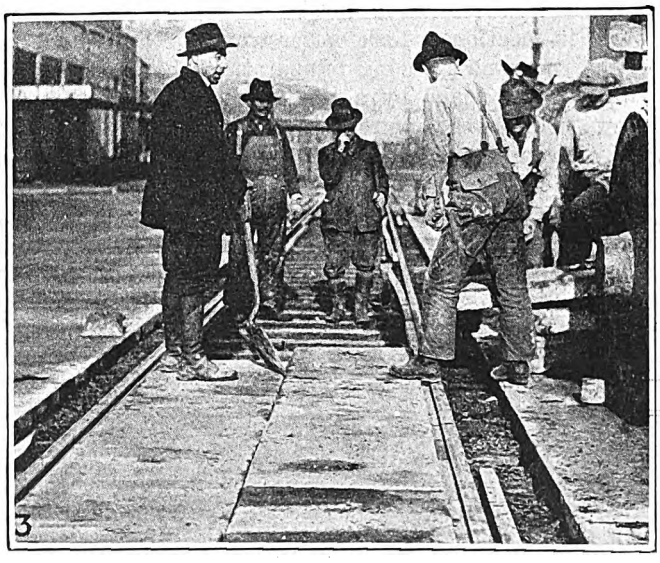
That portion of the city where the precast paving has been installed is built on tideflats adjacent to Willapa Harbor. Formerly these tideflats were badly cut up by deep tidal sloughs, and streets and sidewalks were constructed originally on pile trestles. Third Street, where the slabs were used, was constructed for over a block across a slough varying in depth from 10 to 35 ft.

These tideflats in the business section of the city were filled by a suction dredge, which at the same time deepened and widened the channel in the harbor and river. Material pumped from the bottom of the river varied from fine silt to rather coarse gravel, and during the filling process the heavier material was deposited near the end of the discharge pipe. When it was proposed to pave the street it was realized that with such a spotted fill, varying irregularly in depth, there certainly would be considerable settlement.

All piling under the old wooden streets and side-







Repaving the Track Area in Raymond, Wash., by Using Precast Slabs of Reinforced Concrete

No. 1. Placing concrete paving blocks by means of bars and hooks through the lifting rings.

No. 2. Blocks are easily placed and no interruption to railway traffic occurs when this type of paving is used.

No. 3. Square wooden fillers are used alongside the rail to make a flangeway for car operation.

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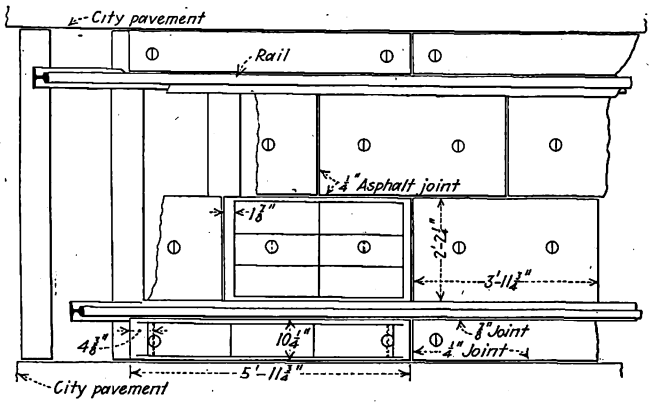
walks was cut off at a depth of 3 ft. below the elevation of the subgrade for the pavement, and sufficient additional material was brought in to care for what settlement had taken place during the period of about 18 months between the time the fill was completed and the paving work commenced. The city constructed an 8-in. concrete pavement on each side of the street and left a 7-ft. slot in the center for the track. Rails were not laid until after the city's paving had been completed. Under the edge of the pavement on each side of the track space an inverted curb was built.

The railway felt that it would be injudicious to construct any rigid type of track on a subgrade of this kind. With this in mind the precast slab pavement was developed. A design furnished by the Portland Cement Association was somewhat modified by the railway's engineers and was amended again in certain respects to incorporate suggestions made by engineers of the State Highway Department.

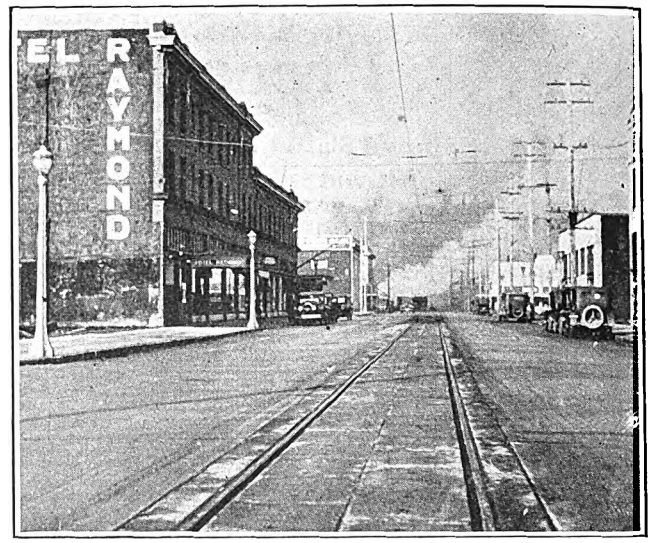
In constructing the track the subgrade in the 7-ft. space was lowered sufficiently to provide for a layer of crushed rock ballast underneath the 6-in. x 8-in. x 6-ft. 10-in. fir ties and 60-lb. A.S.C.E. rails which were used. After the track was surfaced fine crushed



Arrangement of Slabs Along and Between Rails

rock was filled in between the ties and brought to a level with the tops of the ties and rammed in place. This was done on the theory that if the ties settled under the weight of the traffic, the slabs would get added support from the rock between the ties. This practice, however, would not be recommended to be followed in locations where water would be apt to collect in the rock and freezing temperatures be encountered.

Slabs were made by a local concrete products company. They were poured on a wooden platform with partitions arranged to provide the proper sizes. Two rows of slabs each 22¼ in. wide and 4¼ in. thick were laid between the rails with joints staggered, while one slab 10¼ in. wide was laid on the outside of each rail. The slabs used between the rails are 3 ft. 11¾ in. long

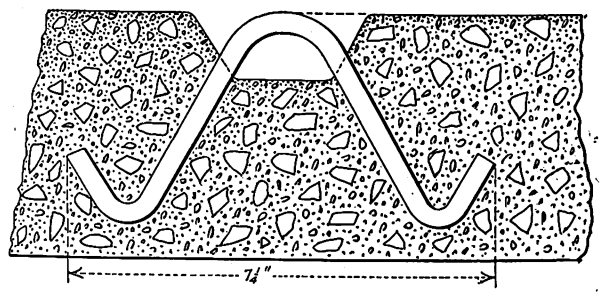


Appearance of the Pavement Made of Precast Concrete Slabs Used in Raymond

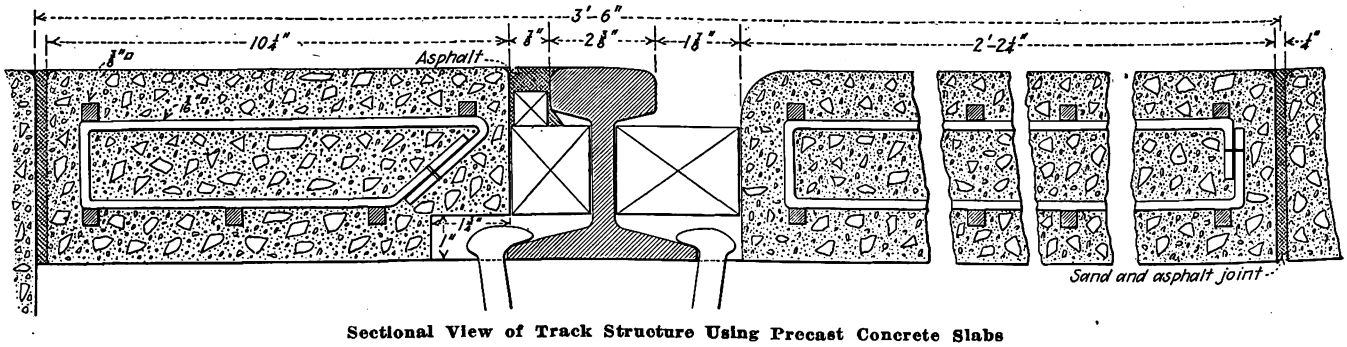
and those on the outside of the rails are 5 ft. 11¾ in. Use of these lengths gave a little leeway in making joints as ties were spaced on 24-in. centers and kept the slabs from "creeping ahead" when they were being laid.

Wooden filler strips were placed against the web on each side of the rail, the inner one being of sufficient width to provide a suitable flangeway. Joints between the slabs were partially filled with dry sand and then poured with hot "D" grade asphalt. The narrow slabs outside the rails were notched to allow space for the spike heads and were set far enough back from the rail to allow space for angle bars and gas-welded bonds on the rail head.

Two lifting rings were arranged in each slab as shown in the accompanying drawings. Crowbars passed through these rings furnished an easy method of lifting and placing the slabs. Moreover it was possible to lay the entire pavement without interruption to traffic. Its construction is such that maintenance is very easy and inexpensive. An additional advantage which the railway finds in this design is a reduction in the noise of operation.



A ⅝-In. Rod Is Used as a Lifting Ring



Sectional View of Track Structure Using Precast Concrete Slabs

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Association News & Discussions

How Utilities Can Gain Greater Public Confidence

Better Service and More Frankness Are Urged at Joint Convention of Illinois Utilities Associations—Railway Men Discuss Many Operating and Maintenance Subjects

SPEAKING before the annual joint convention of the Illinois Gas, Electric and Electric Railway Associations, held in Chicago on March 18 and 19, Martin J. Insull, president Middle West Utilities Company; William A. Baehr, vice-president Illinois Power & Light Company, and John F. Gilchrist, vice-president Commonwealth Edison Company, emphasized the need for utility management founded on the broadest interpretation of the terms service, frankness, fair dealing and individual responsibility. The spirit manifested by these executives permeated all the proceedings and was voiced by speakers in the various sectional meetings. Nearly a thousand delegates and guests manifested an unusual interest in the program, and at the dinner on Wednesday evening the facilities of the Sherman Hotel were taxed to the limit by the unusually large attendance.

Status of "Big Business"

"Many speak of big business," said Mr. Insull, "but few understand it." He pointed out that the early promotional period of expansion from individual craftmanship to modern industrial efficiency, made possible by large concentrations of capital and engineering talent, had been accompanied by abuses and lax business principles. Today modern business is still laboring under the burden of popular prejudice and suspicion born in that early period. This prejudice can be obliterated only by the utmost frankness and fair dealing. Whenever the public finally understands the principles on which modern big business is conducted its attitude will be fair. He held that business must deserve public confidence before it can be gained, and pointed out that the modern business conception of service is most highly developed in the utility industry. Recognition by the public of this fact, he maintained, will wipe out popular suspicion engendered by the monopolistic nature of the utility business.

This same thought was voiced by Mr. Baehr, who called attention to the increasing responsibility which, under present-day conditions, rests upon each individual employee.

This individual responsibility, he said, increases as the process of concentration into large groups of properties continues. Unless the individuals in the industry recognize the importance of their function as humanizing agents in their contacts with the public the friendship and confidence so necessary to success cannot be acquired. Mr. Gilchrist advocated caution and vision. He warned against the dangers of going ahead too fast in power development at high construction prices when capital seems easy to get. On the subject of public relations work, he said that this phase of the utility man's business must not be lost sight of in the stress caused by increasing complexity of the technical problems that arise.

Railway Sessions Reflect Modern Thinking

In the railway section meetings, held during the afternoons of the two-day session, a modernized point of view stood out, not only in the discussion of general management subjects, but it was reflected also in a widened conception of individual responsibility on the part of those charged with maintenance duties. In the treatment of the many subjects discussed the relation of each department's work to the general objective of making friends for the utility and building a better and at the same time a more profitable service was constantly emphasized.

D. W. Snyder, Jr., vice-president Illinois Traction System, discussed the subject of merchandising electric railway transportation. He divided this subject into three phases, namely, methods of holding present passenger business, steps to be taken for regaining business lost in the past, and then measures for building up new business.

Vicious Circle of Economy

"First of all," he said, "it is necessary for each road to set its own house in order if it expects to hold its present business. He then pointed out that when the advent of the automobile had been followed by shrinking railway passenger business, this condition had been met with operating economies and curtailed service, which simply tended to drive more business to the automobile and the bus. Instead of building up gross revenue by giving improved service and then utilizing active and intensive modern selling methods, the vicious circle of economy had been continued, until the condition brought about by deferred maintenance threatened to put many lines out of business entirely.

There must be a service to sell, Mr. Snyder insisted. Clean, attractive cars, courteous employees and service that fits the transportation requirements of the community represent the railway man's stock of goods, and no amount of intensive selling will be productive of permanent returns unless the goods are right first. He said that more business had been driven from electric railways by bad public relations than by any other one cause.

A concrete example was cited of the experience of the Illinois Traction System following the introduction of modern merchandising methods. A faster and improved service was installed on the main division of that road, which resulted in an immediate increase in gross revenue of $11,600 for a three weeks period. In studying the subject of increasing passenger business, he said his property had found that if it could increase the number of passengers carried on each trip by only two, the operations would show splendid dividends. In this connection, he maintained that few electric railways have more than scratched the surface of the possibilities for merchandising their service.

A similar point of view was taken by J. F. Egolf, general manager Aurora, Elgin & Fox River Electric Company. He said that co-operation between the company and its employees was of utmost importance in attempting to merchandise electric railway service. This merchandising, in the last analysis, is done by the employees, according to Mr. Egolf, and if it is to be done successfully, they must first be put into the proper frame of mind regarding their relations with their company and the patrons of the line. This necessary spirit, he said, grows from confidence in the company and its management. He added that nothing could fully take the place of personal contact in winning this confidence.

Four Kinds of Advertising

John J. Moran, commercial manager Chicago Rapid Transit Company, discussed the importance of various forms of advertising in selling electric railway service. Such advertising, he said, takes four general forms, each of which requires distinct treatment. These he divided into advertising of the community itself, selling the service of the company to the housewife and business man, building employee spirit and morale, and safety advertising. He showed many interesting examples of the use of posters, executed with a high degree of artistic skill, and said that these frequently find their way into schools, clubs and other places where ordinary forms of advertising would not be permitted. In addition, he showed many examples of newspaper copy, prepared for the various specific purposes previously outlined.

Other Ways of Building Business

Other phases of electric railway business building were discussed by repre-

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sentative men of the state. A paper was presented by J. R. Blackhall, general manager Chicago and Joliet Electric Railway, outlining the effects of automotive competition on that property. He pointed out, however, that the trend of traffic has recently taken an upward turn. Indications are that the cost of operating a private automobile will rise, and this should increase the use of electric railways.

G. A. Mills, vice-president and general manager Kewanee Public Service Company, outlined the experiences of one of the smallest railway properties in the state in putting its business on a profitable basis. This property has been rehabiliated after having ceased operations for fourteen months, during which period transportation was furnished by buses. When the railway was put back into service track layouts were revised, existing track was rebuilt and a 10-cent cash fare with eight tokens for 50 cents was put into effect. In addition, a $1 weekly pass was sold. In this town of 20,000 population approximately 500 passes are in use and about 20,000 tokens are in circulation. Good public relations have followed the re-establishment of the railway service, according to Mr. Mills. He attributed the difficulties of the previous company primarily to misunderstanding with the community.

Results accomplished through the installation of modern light-weight, one-man interurban cars on the Illinois Valley Division of the Illinois Traction System were described by F. E. Fisher, general manager of that division. He said that when these cars were first received the trainmen had objected to their use, but that determination on the part of the management to improve the service has finally demonstrated that they were entirely practicable. Seventeen of these cars which have been in operation since last August are now showing that this form of equipment results in increased total riding and at the same time makes large savings in expense, so that net earnings are considerably higher than with the old equipment.

Mr. Fisher described a form of bus competition which is still felt to some extent in his territory, and which, he said, seems to be beyond the pale of regulatory control. The bus driver, under this plan, puts himself within the classification of a contractor's agent, by arranging to haul certain individuals in the morning and at night between their homes and work, without engaging in a general passenger transportation business that subjects him to regulatory commission control. He said that the improved type of equipment and service offered by the railway was successful in making inroads on even this form of competition.

Status of Buses and Railways

The general subject of buses in their relation to electric railways was further discussed by W. H. Sawyer, president East St. Louis & Suburban Railway; B. W. Arnold, manager motor coach department Chicago, North Shore & Milwaukee Railroad, and M. L. Harry, division manager Illinois Power & Light Corporation, Decatur, Ill. Mr. Sawyer explained that the relations between bus manufacturers and electric railways have undergone a decided and definite change since the beginning of this form of competition. He said that at first the bus was the outgrowth of the jitney, and in this early stage the bus man didn't care particularly about his relation with the railways and openly said so. This situation was followed by an increasing recognition of the importance of the electric railway as a future operator of buses and a period of active discussion of the various phases of the relations between the automotive industry and the railways. During the last few months, according to Mr. Sawyer, the situation has entered a new phase. He called attention to the resolutions adopted by the American Electric Railway Association at the recent Midyear Meeting in Washington, and also to the statements made there by Mr. Dahl, speaking for the National Automobile Chamber of Commerce.

Mr. Sawyer said that the electric railways and the automotive industry have come to an understanding regarding the general principles upon which their relations should be founded, and urged that electric railway operators assume that the bus manufacturers would in general adhere to the spirit of this understanding. He implied that although individual manufacturers may in some cases fail to adhere to the code advocated and adopted by their own organization, such incidents may be expected to disappear rapidly as the value of full and whole-hearted co-operation becomes increasingly evident.

Mr. Arnold described his early attitude toward buses, when he first experienced the effect of unrestricted competition, and outlined some of the mistakes made by the railways in coping with this new competition. He said that buses as feeders to electric railways have three functions to perform: To serve the territory adjacent to the rail line; to add revenue to the rail line by directly feeding passengers to it; to help give a complete transportation service in a given community so as to improve the relations between the electric railway and the public. He urged that careful surveys be made before starting bus service in new territory, and then advocated that this service, when installed, be made as complete and frequent as possible in order to win the support of the people in the community. He decried the tactics of some high pressure truck salesmen in painting over-optimistic pictures of the possibilities of bus operation, and said that as a result of these tactics many bus lines have been installed in locations where they cannot be successful.

Conditions under which a combined bus and railway service was installed in Decatur, Ill., were described by Mr. Harry. He said that in this city of 50,000 people there is only about 15 miles of street railway track, and that consequently several parts of the community were not properly provided with transportation. As a result of this condition the growth of independent bus operation had been welcomed by the community, and this operation soon reached a scale which required serious consideration by the railway management. The railway finally purchased all the bus lines, substituted fifteen new buses for the old ones that had been in service, and with the co-operation of the city administration, instituted a joint service of railway and bus lines, with universal transfers. Buses are now operated over 10.5 miles of route.

Various phases of electric railway maintenance were presented in papers by J. I. Catherman, engineer maintenance of way Illinois Traction System; F. V. Skelley, superintendent Tri-City Railway, Rock Island, Ill., and T. H. Shaughnessy, assistant superintendent of shops and equipment Chicago Surface Lines. These papers are abstracted elsewhere in this issue.

At the conclusion of the meeting on Thursday, the following officers were unanimously elected for the coming year: President, J. F. Egolf; first vice-president, C. G. Handshy; second vice-president, G. W. Welsh; secretary-treasurer, R. V. Prather. G. A. Richardson, Arthur D. Mackie, R. C. Roderick and D. W. Snyder, Jr., were elected members of the executive committee.

Safety as a Means of Reducing Insurance Costs*

By Charles B. Scott
Bureau of Safety, Chicago, Ill.

THERE is a very definite relationship between the two terms "safety" and "insurance" which is not well understood nor appreciated by the public generally. Many of the insured interpret their insurance to mean, literally, a system by which they may be relieved from losses in excess of premiums paid by them.

Insurance companies are really trustees or custodians of certain funds collected in the form of premiums. If you carry insurance, then eventually you must pay your losses plus the expense of administering the insurance fund plus a reasonable return to insurance company stockholders. You, as an insured, may be faced with a catastrophe when others insured with you will take on their proportion of burden and relieve you of having to bear it all at once, but if you live long enough and continue your insurance, you will pay back year by year until you yourself have paid all your loss.

There is only one possible way by which you can reduce your insurance costs, and that one way is by reducing your losses. There is only one way by which you can reduce your losses. You cannot do it by paying someone else to carry your risks; you cannot do it by having a lot of others in your line of business pay your losses and theirs; you can do it only by removing your hazards and improving your risks—by creating the "state or condition of being safe and free from danger and risk." which is safety, the literal definition of Safety.

The electric railway business is one in which the most diligent and closest economy is obviously necessary. My purpose is to try to tell you how you can save some of the money you are

*Abstract of paper read before Electric Railway Section of Joint Convention Illinois Utilities Associations, Chicago, March 18-19, 1925.

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paying out of your income for insurance costs and accident and fire claims. Most of you buy fire insurance, and your premiums amount to a considerable sum. Your rates on carhouses and rolling stock are high because your loss records on carhouses and rolling stock are bad. Your loss records are worse than they should be—there is a reason for it, and the reason is you are not constantly using earnest efforts to guard such property from fire loss. Not because you do not know how to protect your property, but because you do not ceaselessly follow up the things you know should be done.

There are two very important factors in the reduction of fire losses, namely, the physical condition of the property, and the care exercised by those in charge of it. Good housekeeping and training of employees in carefulness are simple methods of avoiding fires. Careless housekeeping and careless men are largely responsible for the high rates you are paying for fire insurance on your carhouses and equipment. If every electric railway company would seriously and earnestly get to work on these two hazards and keep at it, insurance companies would gladly reduce the rates. They would much rather have a good risk at a low rate than a bad risk at a high rate.

Some electric railway companies carry workmen's compensation insurance. Everything that has been said about economy in fire insurance applies as well to compensation insurance costs —your property and your men—good housekeeping and careful men. You have the same opportunity for reducing your compensation costs.

There is another class of protection which you are compelled to carry yourselves because you cannot buy it. Insurance companies will not accept the risk. This is your risk for liability on account of injury to the public and damage to public property. Unfortunately, this is a risk in which you and your organization do not bear all the responsibility and one which is largely not under control of the management. Fortunately, the public conscience is becoming aroused to the criminality of carelessness. That consciousness is going to help some.

Children are being educated in safety. When they grow to be the men and women of the day, that is going to help greatly. Your industry has had much to do with the present interest by the public and by school children in safety. No industry has been more diligent than the electric railways in trying to enlist public interest and cooperation in safety. You were the pioneers in the work. You have worked hard and it is certain the public is appreciative of your efforts. Results may be slow in coming, but they will come surely. Safety is the best insurance.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 9—Central Electric Railway Master Mechanics' Association, Fort Wayne, Ind.

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 26-27—New York Electric Railway Association, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Maintenance of Equipment in Chicago*

By T. H. Shaughnessy
Assistant Superintendent Shops and Equipment, Chicago Surface Lines

ALTHOUGH many factors influence the cost of maintaining electric railway equipment and differences in schedule speeds, stops per mile, character of roadbed, weight of car and climatic conditions make it difficult to compare the results on one property with those on another, it may nevertheless be of interest to outline some of the practices in use and results obtained on this large property, where schedules are unusually severe and cars are operated over an extremely rigid roadbed.

We use a 5-in. trolley wheel. In 1924 the pounds of wheel used per thousand car-miles was 0.152, or an average of 6,578 miles per wheel. This represents 11.8 per cent increase in mileage over the results formerly obtained with a 6-in. diameter wheel.

The percentage of brake shoe wear to shoes applied for the year 1924 was 71 per cent and the pounds of brake shoes used per thousand car-miles was 39. This result was obtained mainly by close attention to the condition of brake shoe heads, hangers, brake beams and levers. Case-hardened bushings and pins are used in all moving brake parts.

On account of the rigidity of roadbed in Chicago, the wear on journal boxes has been severe and it has been difficult to keep covers tight. After using standard types of boxes, equipped with covers of various designs, with more or less success, a box was designed with a cover that fits in grooves on each side. A groove also extends across the lower edge of the opening and is cut away at the center to drain any water that may collect there. This cover is held in place by a ½-in. machine bolt and is lined with a piece of No. 515 oiled canvas, to prevent rattling and to keep out moisture and dust.

Case-hardened pedestal wear pieces are fastened to each side of the box. We tried electric welding, riveting and another scheme for fastening these wear pieces, but none of these methods was satisfactory. One of the truck manufacturers developed a means of holding the wear pieces in place by casting four lugs on each side of the box and bolting the plates to these with ½-in. bolts. This arrangement has proved successful. The pedestal jaws of the truck are also equipped with wear pieces made of 4-in. standard 5¼-lb. channels, case-hardened. All replacements can therefore be made at carhouses. The journal box wear plates, pedestal wear plates and bushings are hardened in our shops by the cyanide process in a special furnace. An article describing this furnace appears in ELECTRIC RAILWAY JOURNAL for Feb. 28, 1925.

The number of new rolled steel wheels installed and the number of pairs turned on this property are shown by the figures below:

WHEELS INSTALLED AND TURNED BY CHICAGO SURFACE LINES

Year	New Wheels Installed	Pairs of Wheels Turned
1921	8,723	15,238
1922	7,534	17,115
1923	8,451	16,215
1924	11,428	17,812

Open circuits which develop on armatures of various types due to the severe service and rigid roadbed in Chicago have been the subject of extensive investigation. Expansion and contraction of armature coils and leads were carefully studied. Armatures were tested at the shop to determine the effect of temperature changes on the coils. Current was passed through these coils to give temperatures as high as 125 to 130 deg. C. and the expansion of the core, coils and commutator was noted. It was found that the coils and cores expanded $\frac{3}{32}$ in. in a longitudinal direction. The expansion of the top leads in a radial direction was found to be as much as 0.022 in. Since these measurements were made with the armature stationary, the effect of centrifugal force was not noted. The tests made, however, show that there is a decided movement of the coils and leads.

Centrifugal force has evidently played a considerable part in causing the open circuits which have occurred on these armatures. Evidence of chafing between the top of the armature coils at the commutator end and the bottom of the upper leads indicated that there had been motion at this point. Wire bands have, therefore, been installed to bind down the coil extensions beyond the core so as to prevent them from throwing out against the top leads under the action of centrifugal force. This band is 1 in. wide and is located 2 in. from the end of the armature core under the top leads. It has been adopted on all armatures where the band can be held in place, the object being to allow the top leads to expand and contract as freely as possible.

The lay of the leads has been arranged so that they come out of the commutator bars straight and parallel

*Abstract of paper before Electric Railway Section of Joint Convention Illinois Utilities Associations, Chicago, March 18-19, 1925.

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to the bars for a distance of not less than $\frac{1}{8}$ in. In soldering the commutator, the solder is kept back for about $\frac{3}{16}$ in. from the back end of the slot in the commutator bar. This tends to distribute any motion of the lead over some distance and prevents crystallization caused by confining this motion to one spot.

The following table shows the number of armatures rewound and repaired and their proportion to the total number of armatures on the system:

ARMATURE REPAIRS, CHICAGO SURFACE LINES

	Armatures Rewound		Motor and Compressor Armatures Repaired	
Year	Number	Per Cent Total	Number	Per Cent Total
1921.....	3,689	25.4	15,557	107
1922.....	3,923	27.6	14,604	103
1923.....	4,711	21.8	14,490	98
1924.....	4,359	28.5	14,499	94.7

In the last figures are included armatures sent to the shops for changing pinions and bearings, as practically all these changes are made at the shop.

Ordinary heat-treated carbon steel armature shafts were not standing up in Chicago service. Chrome nickel electric steel of the following analysis and specification has been used for all shaft renewals for several years:

Carbon	0.30 to 0.40
Manganese	0.50 to 0.80
Phosphorous	Not to exceed 0.04
Sulphur	Not to exceed 0.04
Nickel	1.00 to 1.50
Chrome	0.45 to 0.75
Physical.	
Tensile strength	90,000 lb. per sq.in.
Elastic limit	50,000 lb.
Elongation in 2 in.	22 per cent
Reduction in area	45 per cent

We have several hundred of these shafts in service and since their installation have never had a failure due to breakage. The effect of this improved material is given in the following figures showing the number of shafts renewed each year since 1921:

1921	1,576
1922	1,717
1923	1,058
1924	858

Budgeting Overhead Line Maintenance*

BY F. V. SKELLEY
Superintendent Tri-City Railway, Rock Island, Ill.

UNDER modern methods of handling finances a railway manager must know each year how much money is needed in each of his departments. To prepare the budget for the overhead department the engineer must determine first the amount of repairs actually needed and then estimate, for each job, the labor costs, the material to be purchased, the material on hand and paid for and the value of scrap trolley, brass and poles taken down.

Speaking from the standpoint of the road with 100 miles or less of trolley, opinions vary as to the best method of obtaining the information necessary to make out a definite plan for repair work. One thing is certain, that with 100 miles of trolley in service 8 or 10 miles must be replaced each year. The age of the wire means nothing, for on some lines No. 00 trolley has been up for 22 years and yet during that time it has had less than 500,000 car movements under it. You cannot allow a wire to wear out, for that means trolley breaks and interrupted service. In measuring 100 ft. of worn trolley wire with a micrometer I found that there was a variation of 25 per cent in the diameter of the wire.

The maintenance crew of a line department may properly consist of a foreman, two linemen and a groundman. An experienced driver is necessary to handle the 2½-ton line truck, as he is usually working in traffic and must occasionally pull a trailer. Under ordinary conditions this crew should do all the maintenance work on 100 miles of trolley for nine months of each year. During the summer months a second crew is necessary for stringing difficult pieces of trolley.

The small or average-sized road cannot go to the expense of holding a maintenance crew in readiness for an emergency, so the line foreman should keep a central telephone operator informed at all times of his location, and an emergency call can be relayed to the nearest carhouse, where a waiting automobile is ready to go for the crew. Supervisors, or other road men, should be able to clear the line in an emergency.

The largest part of the overhead investment is in the pole line, and the major part of these poles are of wood, which if untreated is subject to rapid deterioration when in contact with the soil. The decay of wood is caused by the growth and activity of fungi, which thrive in the soil and attack wood when air, moisture and heat are present. Every user of wood poles knows that the poles start to rot at the ground line where these conditions are to be found. The spores of the fungi germinating in the wood penetrate every part of the sapwood where complex compounds are formed, causing fermentation. Once started the action is rapid, as the wood fiber then becomes food for the fungi. There are several processes in use to prevent rot. Any method that will close the pores of the wood against moisture and air is beneficial. If a pole line is too far gone on account of rot below the ground line, the new pole should never be set in an old hole, as the fungi will immediately attack the new pole.

There is not much to say on the maintenance of iron poles. Paint them every six or eight years and they will take care of themselves. Thirty-foot tubular iron poles have been painted for $1.55 each, using a good grade of steel preservative and paying a painter 75 cents per hour and a helper 50 cents per hour. Bates expanded steel poles cost $1.65 per pole. All poles should be wire brushed to remove scale and rust.

Track Maintenance Practices*

BY J. I. CATHERMAN
Engineer Maintenance of Way Illinois Traction System

IN EITHER open track or paved track drainage is of utmost importance from the standpoint of satisfactory service and low maintenance cost. Without proper drainage, no track can be well maintained. Surface or subsurface water is probably the greatest enemy of good track. On open track drainage is obtained by properly shaping the ballast line, maintaining a proper shoulder on embankment and by keeping ditches open through cuts. In paved streets, a line of tile is located on either side, or beneath the center of the track, and connects to adjacent sewers. But the most effective measure in paved streets is to maintain the paving so that water cannot reach the foundation of the track. Once there, it is certain to cause trouble.

There are many other things which we must look to in properly maintaining open track. The rail, joints, ties and ballast make up the track structure, and on these four elements the bulk of the time of the trackman is spent. Little attention is necessary to the rail itself, so far as everyday maintenance is concerned. Primary attention is directed to keeping it in proper line and surface. Rail does wear out, however, and it will break after a certain length of time unless periodical renewals are made. If this is not given attention disastrous wrecks may be caused. We cannot tell when a rail is about to fail, and the only safe policy is to so shape our rail renewal program that such failures will be reduced to a minimum.

Neglected joints soon produce rough riding tracks. Passengers are quick to note lurching cars and money saved on joints is at the expense of passenger business. Poorly maintained joints give a greater opportunity for spreading rails, and many a truck spring has been broken by a low joint.

OILING THE TRACK JOINTS

About two years ago on the Illinois Traction System we started oiling our joints. We used Standard Oil Company No. 4 Road Oil, and we now have approximately 50 miles of oiled joints. We have found this to be most economical. On one section where we first started oiling I had a recent report that showed approximately one-half keg of bolts used on 5 miles of track for renewals this winter. This is less than 10 per cent of what would ordinarily have been used. Threads on the old bolts and nuts are preserved by the oil and can be readily tightened.

In the maintenance of ties, much money can be wasted or saved. A tie requires approximately one man-hour to install. It costs just as much to install a poor tie—one that will last but five years—as to install one that will last twenty years. It is becoming generally recognized that untreated ties are no longer economical. We began installing treated ties in 1910. Today more than three-fourths of our ties are treated. Renewals are becoming less each year. For 1925 our maintenance program

*Abstract of paper before Electric Railway Section of Joint Convention Illinois Utilities Associations, Chicago, March 18-19, 1925.

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calls for 25 per cent less ties than it did in 1924, and I fully expect to see an equal reduction in 1926. What does this mean to us? Simply that this year we will install 15,000 fewer ties than we did last year and probably 75,000 less than would have been the case had we never installed treated ties. It is evident that the matter is worthy of the greatest consideration as a measure of economy. Ties are becoming more scarce and higher priced each year and we must look to the future when our yearly supply of ties is purchased.

Fortunate is the maintenance man whose track is ballasted with crushed stone or some similar material. A little labor on such track will go a long way. However, many of us must depend upon cinders and other inferior material. Cinders, especially those from a stoker fed furnace, are soft and often very fine. Consequently, they do not stand up under track like the heavier material. Crushed stone, slag, gravel, chatts, or some equal material, results in a very material saving in maintenance labor. Ballast must be kept clean and free from weeds. The latter hold moisture, and in addition to their unsightly appearance tend to produce more rapid deterioration of the structure.

Adoption of standard materials and standard methods helps to make better track at lower cost. Too many foremen are reluctant to give up old practices and prejudices. They must be made to appreciate the importance of their work and must understand that little things neglected make costs mount rapidly.

Labor-Saving Tools

The importance of tools as time and labor savers in the maintenance of way department is receiving more attention each year. On open trackwork five men with a set of tie tampers will tamp more track and do it much more efficiently in one day than will fifteen men by hand. Electric drills and saws are great labor savers. Welding outfits can save their original cost in a very short time. Cupped rails can be built up, frogs and crossings given new points and the gage intersections rebuilt at a small cost with welding equipment. We have many times built up crossings, solid manganese as well as bolted, and increased their life fully 50 per cent.

Maintenance men must be on the lookout continually for new ways of doing things, new ideas, new tools and equipment; devices that will save labor and also save material. These are the days of high costs and it is up to the man in charge of maintenance to keep those costs down. To maintain his track efficiently and well and at a minimum cost is his job, and it is up to him to keep himself educated to the modern ideas and ways of doing things. If he is not constantly on the lookout for new ideas, is not willing to accept them and give them a trial he is not on to his job. Those who most quickly and earnestly adjust themselves to the new conditions will be the first to increase the efficiency of their organizations, which will in turn be reflected in the general condition of their property.

Operating Improvements at Providence*

New Substation Equipment and Transmission Lines, a Block Signal System and Rehabilitation of a Power Station for Use of Pulverized Coal Earn 14.4 per Cent on Cash Expenditures

By W. C. Slade
Vice-President United Electric Railways,
Providence, R. I.

During the last three years the United Electric Railways has carried out a comprehensive program to enlarge and to modernize its power system. Studies were undertaken in the fall of 1921 which led to extensive purchases of equipment during the next two years and to active construction work over a period of three years which required appropriations totaling nearly $2,100,000. Of this, very closely $1,300,000 was for the power plant; $700,000 for substations, transmission and distribution feeders both overhead and underground; $100,000 for track-circuit block signal systems with automatic flagmen at crossings, and for construction and emergency tower trucks for the line department.

Woonsocket Division Power Development

A new semi-outdoor substation was built containing two 1,000-kw. rotaries, with space for a third. To serve this station a double-circuit No. 00 copper transmission line was built from Providence to Woonsocket, with four sectionalizing oil circuit breakers at Lincoln substation near the midway point. A 12-mile single circuit branch-off from this line at Lincoln substation was built cross country to Oakland automatic substation. At Lincoln substation two new rotary converters were installed, together with new switchboards for control of seven new outdoor oil circuit breakers, including the four sectionalizing breakers previously mentioned. Supervisory control apparatus has also been installed at Lincoln and at North Main Street substations, so that in the near future the seven oil circuit breakers can be operated over pilot wires from the latter substation, which is in Providence. All transmission lines and new oil switches and transformer equipment are built for ultimate operation at 22,000 volts, although at present they will be operated at 11,000 volts. This development made it possible for the United Electric Railways to supply its own power generated at its modernized power plant to a distant division for which power generated largely in an old steam plant in Woonsocket had been purchased for many years.

North Main Street Substation

A combined transmission switching and rotary converter substation was built on North Main Street in the city of Providence. The switching station, which contains entirely General Electric equipment, has a ring bus, sectionalized at four places, and provides for ultimately twelve oil circuit breakers of H-3 type. Bus and circuit breakers are on separate floors. At present there are eight breakers in service; two serving rotaries in the building, two serving the Woonsocket transmission lines, and four serving lines running to the generating plant and to Pawtucket substation. This switching station permits power to be trunked from the generating plant in large quantity, with a consequent material saving in number (and hence cost) of underground cables at a future time, to a convenient point for distribution as required over several transmission lines. Altogether, six substations receive power delivered over this ring bus. This rotary station is an all-Westinghouse station with two 2,000-kw. rotaries supplied by three-phase transformers, and there is space for two more similar units. The construction of this rotary substation made it possible to relieve the Pawtucket substation, which was seriously overloaded in winter, of approximately 1,000 kw., and to give much improved voltage to a section of the distribution system where poor conditions had previously prevailed. With improved voltage the important Providence-Pawtucket express service was also benefited.

Additional Equipment in City Substations

A new General Electric 2,000-kw. rotary and three-phase transformer were installed at Manchester Street substation to replace one of the two d.c. engine-driven generators that had to be scrapped when the generating plant was remodeled. A similar unit was installed in Olneyville substation after a 1,000-kw. unit had been transferred to the new Woonsocket substation.

Underground Conduits and Cables

A start was made to put certain important power circuits underground to replace existing overhead feeders with feeders of much increased capacity. Approximately 2.02 miles of trench of single and multi-duct tile and fiber conduit, totaling an equivalent of 23.9 miles of single conduit, has already been laid. In some of this duct space 2.65 miles of underground cable was installed. In addition, 1.55 miles of submarine cable was laid under the Providence and the Seekonk Rivers.

Block Signal Systems

Eight miles of single track and some double track on right-of-way on the high-speed line between Providence and Woonsocket were equipped with Union Switch & Signal Company's track circuit TDB signal system. Also the same manufacturer's automatic flagmen were installed at all highway crossings. Extensive repairs to signal trunking and ground circuits have been in progress on another high-speed road (Providence to Buttonwoods) and are now nearly

*Abstract of a paper delivered before the New England Street Railway Club on Feb 5, 1925.

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complete. A number of additional Chapman automatic signals have been installed on city lines operated with one-man cars.

Rehabilitation of Manchester Street Power Station

The large amount of work at the Manchester Street power station was done both to provide additional dependable generating capacity and to introduce operating economies throughout the plant to as great an extent as possible.

It was decided to wipe out of existence the entire 8,000 kw. of engine-driven generating equipment and the entire low-pressure boiler equipment, retaining only for the time being the small 2,500-kw. turbine for stand-by service. This decision at once required practically the elimination of the original power-plant equipment and necessitated writing off our books in one lump sum approximately $633,000.

In the turbine room it was decided after careful study to install an 18,000-kw. General Electric turbo-generator with a Westinghouse twin jet condenser. This went in the same location previously occupied by one of the 2,500-kw., d.c. engine-driven generators. It is interesting to note that the generating capacity was increased sevenfold without any tax on additional building capacity, except for the small space occupied by a rotary converter and its transformer, pending the time when the substation equipment can be housed outside. In the boiler plant the space originally occupied by two decks of boilers of approximately 8,000 boiler-horsepower was used to accommodate ultimately four 1,266-hp. boilers set high in the air. Only three boilers were installed at this time.

Inasmuch as a description of the new plant in reasonable detail was published in the ELECTRIC RAILWAY JOURNAL of April 28, 1923, a detailed description will not be repeated at this time. Reference should be made to this article for details of equipment and the description of the method of handling and preparing the coal for burning.

Boilers Fired with Pulverized Coal

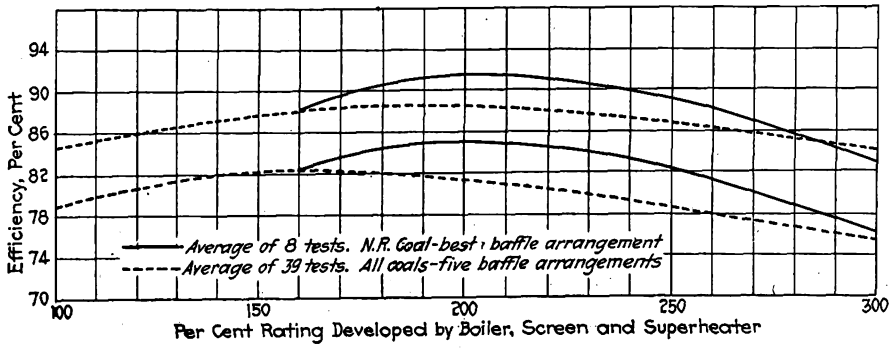
After one year's experience we believe that our decision to use pulverized coal under the conditions prevailing has been thoroughly justified. First of all, we expected to get better over-all boiler plant efficiency than we could get with stokers. The results obtained lead us to believe that we have done so. This increased efficiency has been due to the elimination of banking losses on the one hand and to the more efficient burning of coal on the other hand. One of our pulverized-coal-fired furnaces can be closed up tightly, like corking a huge thermos bottle, as there are no gases to contend with from a banked fire. For example: a boiler banked while the pressure was at 205 lb. showed 15 lb. pressure after a period of 24 hours, and some pressure after 48 hours. In burning the pulverized coal, the amount of excess air can be reduced with care to as low as 12 per cent or 15 per cent, and it is easy to operate with excess air ranging from 20 per cent to 25 per cent, which in itself spells efficiency. It is easy to maintain from 14 per cent to 15 per cent CO_2 in the flue gases leaving the boiler, and on test work 15 per cent to 15½ per cent CO_2 is often maintained throughout the test.

It was also expected that with pulverized coal boiler outage would be greatly reduced because as a rule in stoker-fired plants boiler outage is due more often to clinker trouble on the stoker or on the furnace walls than to trouble with the boiler itself. We have had a remarkable record during the first year of operation of our new furnaces and boilers. During this entire period we have not had to replace a single tube in any boiler, superheater or economizer. We had to reroll only two boiler tubes after the installation was started up. This speaks well for the equipment, for the workmanship of installation and for the favorable conditions obtained in pulverized coal practice. Also, during this entire period we have not had to renew any brickwork* in any one of the three furnaces, which together have burned now from 35,000 to 40,000 gross tons of coal, including 1,200 tons from Rhode Island.

The flexibility of operation of a pulverized-coal-fired furnace also appealed greatly to us. A furnace can be started quickly with pulverized coal. We put a stone-cold furnace on the line in 50 minutes and an idle but warm boiler was brought up to a fair rate of steaming within twenty minutes without difficulty. Boilers fired by pulverized coal can be banked instantly when desired. It is indeed necessary to guard against accidental banking due to any unexpected failure of the supply of electrical energy to the boiler plant for plant motors. The equipment must be mainly motor driven. It is advisable therefore to have the feeder motors and the primary air-pressure blower motors supplied either in whole or in part from an independent source—by use possibly of a suitable auxiliary steam-driven generator. These essential motors are really in about the same class with boiler feed pumps which are generally steam turbine driven.

Another consideration that we gave to our decision to use pulverized coal was the reduced ash to be handled as well as the ease with which it could be handled by mechanical means and with little labor. We ran our first boiler for five weeks before any ash was removed from the ash hopper. This was because we were burning a very low-ash coal. As a regular procedure, however, we now remove the little ash that does collect each day from the ash hoppers.

Finally, from observations that we had made in the West, we were convinced that by burning coal in pulverized form we could burn with practically equal efficiency low-grade coals and high-grade coals. In fact, we concluded that we could burn with high efficiency any coal that was worth shipping from the coal fields to New England. Our pulverized-coal-fired furnaces were designed to burn bituminous coal of 14,000 B.t.u. as fired with maximum capacity and maximum efficiency, and to burn anthracite coal with reduced capacity, but, we hoped, with reasonably high efficiency. During the past year we carried out a number of tests in burning Rhode Island coal. We found that we could not burn Rhode Island coal alone successfully because of the lack of volatile which is required to sustain combustion. We did find, however, that a small amount of bituminous coal with approximately 20 per cent volatile mixed with Rhode Island coal enables us to burn the mixture entirely satisfactorily and with high efficiency. We burned on many occasions mixtures containing as high as 75 per cent Rhode Island coal. On our test work, however, we confined our mixtures to those which contained 50 per cent and to those which contained 66⅔ per cent Rhode Island coal. Taking seven of these tests made with these mixtures, you will be interested to know that our unit efficiencies with economizer ranged from 84.4 per cent to 88.4 per cent. The over-all rating on the unit, expressed in terms of boiler rating for these same seven tests, ranged from 157 per cent to 272 per cent. The heat units in the coal mixture as fired ranged from approximately 10,800 B.t.u. to 11,600 B.t.u.†



Results of Boiler Tests with Pulverized Coal

No. 9, Bigelow-Hornsby 1,266-hp. boiler with Foster economizer.
Upper curves are for unit efficiency.
Lower curves are for boiler, furnace screen and superheater efficiency.
New River semi-bituminous coal, 30 tests.
Gas coal, Wise County, Va., two tests.
Combination of Rhode Island anthracite and New River bituminous mixed, seven tests.

*The deterioration of the front wall of the furnace had progressed further than realized when the paper was delivered, Feb. 5, so that on Feb. 18 it failed near the top to such an extent that it was considered advisable to remove all of the old wall down to the bottom of the lowest air passage. In places the brick had gradually spalled away, leaving only 2½ in. to 4 in. of material. It is believed that the refractory had in general wasted away by spalling rather than by slagging with molten ash. The wall is being rebuilt with improved construction and a still longer life is expected from the rebuilt wall.

†For further information regarding these tests refer to a paper presented by Henry Kreisinger before the A.S.M.E. at its December meeting in 1924.

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It was once thought necessary to dry all coal to be pulverized and burned in pulverized form. In order to be on the safe side we installed waste gas driers in our boiler plant. We feel comfortable in having the driers available for use in case of emergency should the coal be excessively wet. We have not yet, however, been obliged to use our driers and we have burned a considerable amount of coal that contained between 4 per cent and 6 per cent moisture at time of milling.

We installed four Raymond six-roll mills rated at a ton per roll. We can pulverize sufficiently fine to burn efficiently New River and Pocahontas coal at the rate of 7, 8 and even 9 gross tons per hour, the output being reduced as the moisture in the coal increases. On the average it takes only 12 kw.-hr. per gross ton to mill this kind of coal. It is costing us less than 9 cents a ton to do the milling as far as power is concerned.

Although the plant has run a little more than a year, we have as yet no definite idea of what the annual maintenance will be because of the fact that we have not yet begun to renew some things which are subject to renewal. Thus far maintenance on the outside has cost us not more than 3½ cents per gross ton pulverized. Labor of milling is also reduced because the man on each shift who looks out for the mills regularly has other duties to perform throughout the boiler plant when not milling coal. Based on actual time employed in milling, labor costs approximately 5 cents per ton and not over 11 cents per ton with all idle time charged in.

Operating Results from the New Boiler Plant

All tests were carried out on the same boiler between the months of May and October, 1924. No changes were made in the boiler (known as No. 9 unit) throughout the test except in case of the baffling arrangement in the front half of the boiler. Altogether five different baffling arrangements were used, giving for certain arrangements relatively poor results and for other arrangements good or very good results. Baffling arrangement known as No. 5 gave the best results. I am showing you two sets of efficiency curves; one set representing the average of all 39 tests, good, bad and indifferent; the other higher set representing the average of the eight tests with bituminous coal carried out with No. 5 baffling arrangement. The two top curves represent over-all unit efficiency with economizer. The two lower curves represent over-all efficiency without the economizer. With the best baffling arrangement 90 per cent or better over-all efficiency was obtained over a part of the curve from 175 per cent to 225 per cent of boiler rating; and 86 per cent or better from 150 per cent to 275 per cent of rating.

I have listed also the first fifteen most efficient tests, without consideration of the relation to the baffling scheme, the rate of steaming, the order of the test or possibility of gross error. Note that five tests run between 90 per cent and 93 per cent, and that the other ten run between 87 per cent and 90 per cent for over-all unit efficiency. Seven of these tests were made with the boiler ratings averaging between 200 per cent and 260 per cent of nominal rating. Note that throughout the tests the exit gas temperatures from the economizer were satisfactorily low, ranging from 250 deg. up to 300 deg. where the rating of the boiler did not exceed approximately 235 per cent to 240 per cent. Note also the high CO_2 in flue gas maintained throughout tests, ranging from 13.8 to 15.5 per cent.

As compared with these high efficiency figures on test, the average day-in and day-out over-all boiler plant efficiency for a period of 3½ months was found to be 85.3 per cent for the pulverized-coal-fired plant. This is to be compared with an over-all efficiency of 81.6 per cent for the new and old boiler plants combined during the same period. The efficiency for the entire boiler plant was pulled down because of stoker-fired banked boilers, a few of which were kept available for service during the testing period and during the time that the pulverized coal-fired plant was being tuned up, so to speak. At very poor efficiency we evaporated in the stoker-fired plant approximately 10 per cent of the total water evaporated, based on actual water fed to the boilers determined by meters. This indicates, therefore, that with the elimination of all stoker-fired boilers we can count on an over-all efficiency of the boiler plant of at least 85 per cent, averaged over a long period.

BOILER TESTS ON NO. 9 BOILER FIRED WITH PULVERIZED COAL, MANCHESTER STREET STATION, UNITED ELECTRIC RAILWAYS OF PROVIDENCE

Partial Summary of Fifteen Most Efficient Boiler Tests

Baffling Scheme	No. of Test	Per Cent Efficiencies Over-All Unit	Per Cent Efficiencies Without Economizer	Per Cent Ratings Boiler	Per Cent Ratings Boiler	Degree Temperatures Leaving Boiler	Degree Temperatures Leaving Economizer	Per Cent CO_2 in Flue Gas
5	31	93.0	85.6	206	224	537	268	14.6
3	14	92.0	84.8	173	188	520	258	15.0
3	15	90.7	82.9	210	229	582	288	15.4
1	3	90.5	84.8	141	151	450	223	14.7
3	16†	90.2	83.0	222	241	572	269	15.5
5	35*	89.7	84.0	148	157	490	242	14.0
5	29	89.7	83.5	166	179	491	242	14.7
3	18	89.4	81.5	173	190	573	269	15.0
3	20	88.7	81.8	162	175	524	254	14.9
3	17†	88.3	80.9	209	228	562	280	15.0
5	27	88.2	82.2	160	172	503	250	14.8
5	28	88.0	81.3	259	280	592	301	14.5
5	38*	87.9	80.2	248	272	578	304	13.8
5	36*	87.4	80.2	208	227	551	288	13.9
4	24	87.3	81.8	173	185	465	234	15.5
		Partial Summary of Five Highest Rating Tests						
5	28	88.0	81.3	259	280	592	301	14.5
3	13	86.8	78.0	292	324	659	238	15.0
5	33	85.1	77.0	302	333	595	307	14.3
1	6	84.4	78.3	269	291	562	309	15.0
5	32	81.4	73.4	294	326	643	336	14.3

* Rhode Island half coal in mixture.
† High volatile (31.2 per cent) gas coal. All other tests, New River, W. Va., semi-bituminous coal.

A Discussion of Operating Results in Plant Economy

For a five-month period ending Nov. 30, 1924, the plant was run on 22,800 B.t.u. per kilowatt-hour generated, which is equivalent to 23,800 B.t.u. per net kilowatt-hour. The corresponding coal factors are 1.70 lb. per kilowatt-hour (net) and 1.63 lb. per kilowatt-hour (generated).

Based on these data, we feel that we may confidently expect to produce a net kilowatt-hour on 22,000 B.t.u. with 300-lb. steam pressure at the turbine throttle, with banked boilers eliminated and with machine hours of the vertical turbines further reduced. This, assuming for fuel 14,000 B.t.u. coal as fired, means 1.5 lb. per kilowatt-hour generated and 1.57 lb. per kilowatt-hour output. It is further based on the assumption that power generated per year will not exceed 75,000,000 kw.-hr., as the equipment performance at the time of designing the plant was predicated as a 70,000,000 kw.-hr. load.‡ The new equipment by itself will, of course, do better than this, as should be expected, based both on the excellent boiler plant efficiency and on the excellent water rate of the new turbine, which at its best point requires only 10.5 lb. steam per kilowatt-hour; at one-third load, 11.8 lb.; at full load, 10.65 lb.

Return on the Investment

From Jan. 1, 1918, to June 30, 1923, a period of 66 months, the average coal factor was 2.62 on the generated basis and 2.65 on the output basis. There has, therefore, actually been a decrease of 0.95 lb. coal per net kilowatt-hour and 0.99 lb. coal per kilowatt-hour generated. With the improvement in economy yet to be expected, this improvement is subject to increase. But let us take an even pound for conservative figuring. This means 31,200 gross tons coal saved per annum, on the basis of 70,000,000 kw.-hr. generated. At a cost of $6 a ton as fired, this represents $187,200 saved per annum. This, incidentally, is a return of 14.4 per cent on the cash outlay of $1,300,000. It is, however, a return of nearly 28 per cent on the increase in book value of the plant, after allowing for deductions for retirements.

Taking the entire power system development as a whole, we are now confident that with the proved success of the power plant job we will receive a return on the entire investment in excess of that originally hoped for, and equal to not less than 13½ per cent. This statement is made on the assumption that coal as fired at the power plant costs $6 per gross ton. Included in this investment are all non-revenue producing expenditures such as block signal system, underground conduits, etc.

‡The wide variation in the railway load curve with consequent unfavorable load factor is another element affecting adversely better performance.

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Automotive Discussion at Brussels

THE rôle of the motor car in the economic development of the United States during the last two decades will be told in a report to be prepared by a committee of prominent Americans for consideration at the third general meeting of the International Chamber of Commerce at Brussels, June 21-27. Thirty-nine countries holding membership in the International Chamber will be represented at the Brussels meeting, at which prominence will be given to "Economic Restoration."

The general subject of motor transportation and highway development was added to the agenda of the Brussels meeting at the solicitation of the American Section. In the opinion of the American Section, the economic and social effects of the development of motor transportation in the United States have been of such great importance that a representation of the past and present American situation would be of great benefit to European delegates.

Roy D. Chapin, chairman of the board of the Hudson Motor Car Company, has been named chairman of the committee which will draft the report. Particular stress will be laid upon the use of motor transportation in supplementing the existing lines of rail and other transport. The question of highway development will also be covered in the report. The experience of the United States in the matter of "Rules and Regulations" of traffic and taxation of motor vehicles will be put before the Brussels meeting.

Tramway and Bus Relations

THIS subject came up at the annual meeting of the Tramways and Light Railways Association in London, England, and was discussed by many distinguished railway officials. It was the general opinion that the tramways were the only solution of the traffic problem, both from the economic and financial point of view, and that while the motor bus should be used extensively in auxiliary service, it was incapable of handling mass transportation.

National Association of Purchasing Agents

THE tenth annual convention of the National Association of Purchasing Agents will be held in Milwaukee May 25-28, inclusive. An exhibit will be held in connection with the convention. W. L. Chandler, Woolworth Building, New York, is secretary of the association.

Utility Men to Meet with Advertising Clubs

EXECUTIVES of public utility companies will take an important part in the convention of the Associated Advertising Clubs of the World at Houston, Tex., May 10 and 15, according to an announcement by William H. Hodge of Chicago, president of the Public Utilities Advertising Association. The public utility men will hold two sessions of their own. Subjects to be discussed are, "Costs and Results," "Better Copy," "Keeping an Organization Abreast of Its Advertising," "Motion Pictures," and "Good Will and Institutional Advertising."

Russians Hold Tramway Conference

THE second all-Russian tramway conference was held in Leningrad on Jan. 25. After two years of elaborate research work, the standing committee presented for the aproval of the conference standards covering axles, wheels and tires, grooved rails, trolley wires and rubber hose. Specifications were also presented for car springs, lamps, trolley and span wires, brushes and paving materials, white metal, and aluminum bows. Other parts of equipment were also considered. Standards for traction motors were discussed, and the question was raised as to whether standardization will be taken up with the International Tramway Association.

American Association News

Power Generation and Conversion

A MEETING of the committee on power generation and conversion was held at association headquarters, New York, N. Y., on March 13. Those present were: L. D. Bale, chairman; C. E. Bennett, H. W. Codding, H. E. Davis, F. W. Peters, R. L. Weber and G. I. Wright. Mr. Dixon represented C. A. Butcher and Mr. Mueller represented G. W. Saathoff.

An outline of the progress made by the National Electric Light Association on the subject of specifications for the purchase of fuel was given. The revision of these specifications has been a subject of investigation by a subcommittee of the prime movers committee of the N. E. L. A., and a tentative specification was submitted in 1923. Additional comments were included in the 1924 report. The committee on power generation and conversion considered it unnecessary to duplicate the work of the N. E. L. A., but a review of the subject will enable the committee to submit desired revisions.

Substations were divided into three proposed groups, full automatic, semi-automatic, and partially attended stations. Considerable difficulty was experienced in differentiating between substations to be classed in the second and third groups. The committee decided to define rather definitely automatic substations, in so far as these plants can properly be classified as fully automatic and semi-automatic substations. In regard to the third classification, the committee decided that where the results obtained by the functioning of the control schemes were not sufficient to justify a station being termed as semi-automatic, that the term automatic would be applied incorrectly, and therefore should not be used in describing this type of plant.

A full automatic substation was defined as a plant in which the control installed will give maximum protection to service and equipment and where all the functions of operation are performed without the aid of an attendant. A semi-automatic station is one in which the control installed will give partial protection to service and maximum protection to equipment. The act of placing this class of plant in operation after it has been discontinued either by reason of normal or abnormal operation must be accomplished manually.

The final report of the committee will contain a tabulation of various automatic devices, which are included in the functioning of equipment operating in the two classifications of substations.

An outline of the principal scheme of direct-current automatic feeder control was presented. This covered three combinations, not including the well-known resistor type. The committee decided to include in the report a discussion of the adaptability of the various control schemes offered with a view of determining the limitations of each.

A very comprehensive procedure for conducting tests of ventilation and investigation as to noise reduction in operation of automatic substations was presented.

In regard to the subject of high tensile strength bolts for use of superheated steam line pipes, it was brought out that the American Society for Testing Materials is preparing specifications on this subject, which are also being considered by the National Electric Light Association. In view of this, it appears unnecessary for the committee on power generation and conversion to take action at the present time.

Accident Prevention Posters Ready

FOLLOWING the recent national conference on highway safety which was held at Washington the American Electric Railway Association pledged itself to display certain accident prevention posters in its cars during the coming year. Subsequently, the committee on publicity caused the first of these posters to be prepared. Samples of them are being sent out now. Other posters will be worked out in co-operation with the representatives of the conference at various times during the year.

No charge will be made for these posters when ordered in reasonable quantities. By this is meant a sufficient quantity to cover the cars on a single system or the bulletin boards of a plant. Should an organization plan a city-wide campaign that would require the use of hundreds of posters, some charge might be found necessary.

The Advertising Section is receiving orders for the posters.

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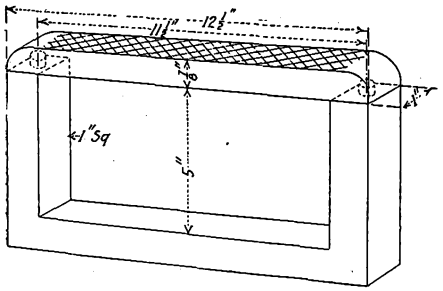
Maintenance of Equipment

Grinding Triple Valve Seats

A SIMPLE device for grinding triple valve seats has been installed in the Naval Academy Junction Shops of the Washington, Baltimore & Annapolis Electric Railroad. This company operates high-speed multiple-unit interurban trains between Baltimore, Annapolis, Washington and intermediate points. To prevent air blowing past the triple valve ports it is necessary that the surfaces of the piston and the valve seat be smooth and in close contact. As the piston can be removed easily it is a simple matter to grind down any high spots on its contact surface.

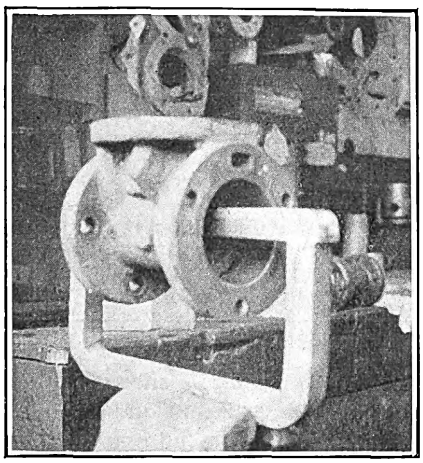


This Jig Is Used by the Washington, Baltimore & Annapolis Electric Railway for Grinding Down Triple Valves

The valve seat, on the contrary, is rather inaccessible for grinding. To accomplish this a jig has been built in the shape of a hollow square as shown in the accompanying illustration. A piece of 1-in. square steel has been bent to form three sides of the square. Across the fourth side is a piece of 1-in. x ⅜-in. cast iron with ⅜-in. serrations on its upper surface. The dimensions of the cross-piece are arranged to correspond with the interior dimensions of the valve. This piece is held by dowel pins extending from the ends of the larger member.

A vise holds the bottom of the U-shaped piece in a vertical position. The top bar is placed inside the triple valve casting as shown in the accompanying illustration. Grade FF carborundum is applied to the serrated cast iron surface and by moving the valve back and forth the seat is ground smooth.

By means of this apparatus it has been possible to restore triple



Triple Valve Casting in Position on a Jig Designed to Grind Down the Valve Seat

valves to good condition in a comparatively short time. The average is about two hours for taking the valve apart, grinding smooth the piston and the valve seat, and reassembling the parts. Previously it was necessary to send the valves back to the manufacturer for repairs.

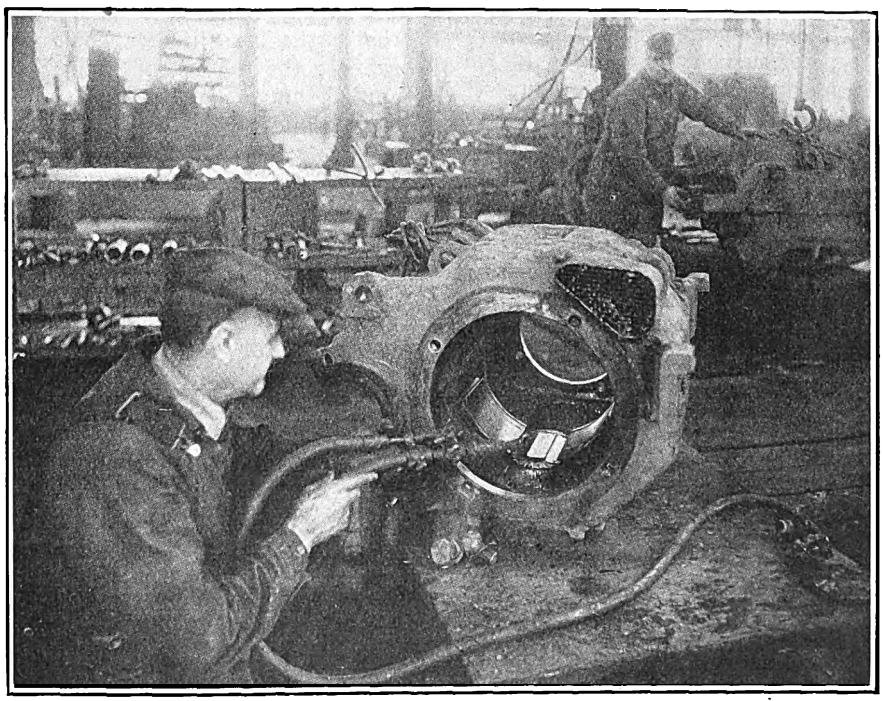
Spraying Varnish Inside Motor Frames

THE practice of coating the inside of motor frames with Sterling varnish after the field coils have been assembled is employed in the shops of the Department of Street Railways for the City of Detroit, Mich. The varnish is applied with a home-made spraying gun which has two flexible connections, one for the air supply and the other for the Sterling varnish. Convenient valves in the two lines provide for ready adjustment by the operator. The varnish is sprayed in around the field coils, and also covers places of the frame which are liable to cause short circuits or grounding from flashovers. An accompanying illustration shows a motor frame being coated with the varnish.

"Bad Order" Cards

THE blanks used in the repair shops of the Interborough Rapid Transit Company for "bad order" field coils and armature coils are reproduced in the accompanying engravings. These cards were mentioned in the article on the Interborough shops on pages 440 to 449 in last week's issue. These cards are 5½ in. x 7 in. The field coil card is printed on white stock, the interpole field card on blue stock and the armature card on buff stock.

The feature of these cards is the



Spraying Varnish Inside Motor Frame in the Shops of the Detroit Municipal Railway

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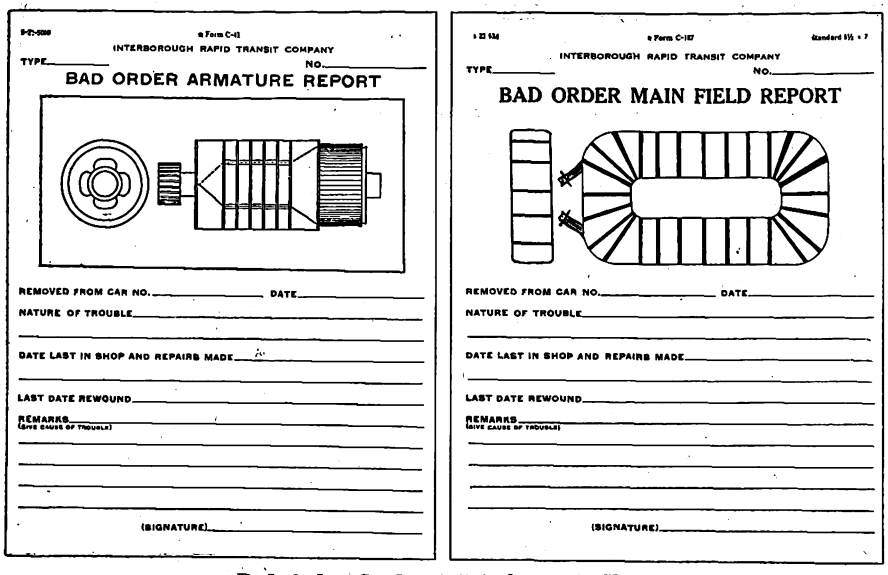


Bad Order Cards at Interborough Shops

use of a cut on which the defects in the coil may be marked. The backs of these cards contain space for further remarks and also a duplicate of the cut.

Improved Motor Suspension

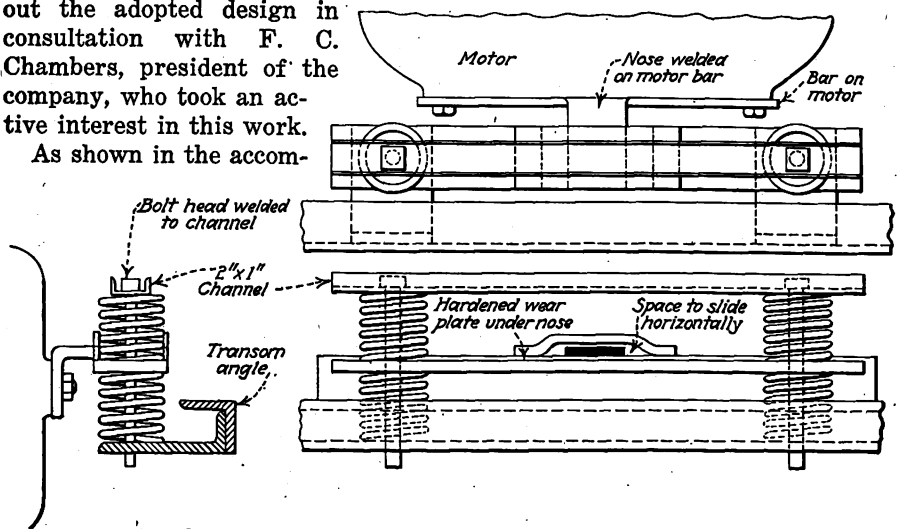
AN IMPROVED type of motor suspension has been developed by the Des Moines City Railway and is being installed on Brill 77-E-1 trucks in use on that property. The object has been to make the suspension more flexible to relieve the shock on the entire equipment. At the same time the design employed permits a certain amount of lateral motion at the suspension nose, so as to avoid binding and breakage of axle bearings.

Improvement in the customary type of suspension was considered an important and necessary step. C. R. McMahon, master mechanic, worked out the adopted design in consultation with F. C. Chambers, president of the company, who took an active interest in this work.

As shown in the accompanying drawing, a short flat nose is welded to the suspension bar bolted to the motor. This nose is supported between the two sets of suspension springs, on a flat bar. It can be seen from the design that the nose is thus permitted a certain amount of lateral motion.

Across the tops of the suspension springs, a 2-in. x 1-in. channel is carried. The bolts passing down through the springs are welded to this channel. This helps to hold the springs in a vertical position under the action of any side stress. The bottoms of the springs are supported on short pieces of angle fastened to the lower face of the transom angle to lower the point of support so as to permit the use of a longer spring.

Results from the use of this type of spring motor suspension show that the resilient construction relieves the motors of many shocks and hammer blows and reduces motor failures.



By Supporting the Motor on a Suspension Arranged to Permit a Certain Amount of Lateral Motion Axle Bearings Are Relieved of Binding and Excessive Wear and Breakage Are Avoided

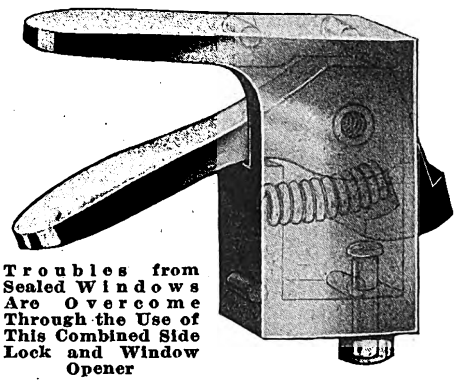
New Equipment Available

Buffing and Polishing Machine

AN EXTRA heavy-duty double spindle and a heavy-duty single spindle buffing and polishing machine have recently been placed on the market by the Cleveland Armature Works, Cleveland, Ohio. Both of these machines are chain-driven by alternating-current motors, designed for the particular service, set close to the spindles. The double-spindle unit is provided with two motors, each spindle being entirely independent mechanically and electrically. Both machines are equipped with Timken tapered adjustable roller bearings. Control is through an oil circuit breaker and push-button.

Window Opener Combined with Sash Lock

TO MEET the demand for a device which will assist in starting windows after they have been left shut for some time, the National Lock Washer Company, Newark, N. J., is placing a combined sash lock and window opener on the market. This device acts as a sash lock on a rack in a manner similar to other types manufactured by the company. In addition, a pin extends through the bottom of the lock case which, when the window is closed, rests on a plate on the window sill or a section of the rack turned at right angles. Pressure exerted against the lower finger piece of the lock is multiplied many times and transmits a downward thrust to the pin against the sill. This is sufficient to start the sash. When started, it usually can be raised quite readily. The lock is secured to the sash frame by four dowel pins and a through screw.



Troubles from Sealed Windows Are Overcome Through the Use of This Combined Side Lock and Window Opener

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The News of the Industry

Railways Not Hard Hit

Small Damage to Electric Systems in Storm-Swept Zone—Distribution Plants Suffer

Despite the terrible loss of life and property in the tornado-stricken districts of southern Illinois and western Indiana, reports from the utilities operating in these territories indicate relatively small damage to electric railway properties. Many representatives of utility companies attending the convention of the Illinois Utilities Association in Chicago left hurriedly to return to their stations in the stricken districts. Of the towns which suffered the worst casualties, West Frankfort and De Soto, Ill., and Griffin and Princeton, Ind., are served by the Central Illinois Public Service Company, controlled by the Middle West Utilities Company; Murphysboro, Ill., by the Western United Corporation, and Duquoin, Ill., by the Illinois Power & Light Corporation. Other towns in which casualties were heavy in proportion to the population are served by municipal plants from which no reports have yet been received.

Everywhere in the devastated towns the electric light and power companies showed their public spirit by prompt restoration of service and the extension of help of every kind within their power. In West Frankfort, for instance, where it will take a month to restore gas service, electric lights were burning two days after the disaster.

A typical example of the effects of the storm is contained in the experience at Princeton, Ind., with more than seven thousand inhabitants. The tornado devastated the southern half of this town, completely wrecking a portion of the Consumers Power Company's 33,000-volt double-circuit transmission line and its distribution system. The Southern Indiana Gas & Electric Company's 33,000-volt transmission line supplying that company's interurban railway into Princeton was completely wrecked for more than a mile, and it will probably be several weeks before the traction line is again in operation between that point and Evansville, Ind.

Will Appeal to Governor on International Railway Rate Case

Frank C. Perkins, the Socialist member of the City Council of Buffalo, N. Y., has demanded that the International Railway be required to post a bond for $500,000 and give rebate slips to car riders in case the 8-cent fare decision of the Public Service Commission is not sustained. An appeal from the higher fare allowed by the state utilities board will be taken by the City Council.

The City Council also will ask Governor Smith to review the rate case with the idea that if the Public Service Commission has been found negligent, the Governor could be asked to recommend the removal of the commissioners from office.

When the City Council informed William R. Pooley, member of the state utilities board, of the ultimatum that the railway would undertake no track reconstruction or repaving because of lack of funds, Commissioner Pooley replied that the city has authority to compel the railway to put its tracks in such condition that the city can carry out its 1925 street paving program.

William F. Schwartz, commissioner in charge of this phase of municipal work, has informed the City Council and members of the Public Service Commission that the ultimatum of President Tulley of the International is delaying the repaving and improvement of more than 30 miles of streets in Buffalo.

$700,000,000 Transit Program

City of New York Proposes Staggering Expenditure for System to Be Municipally Operated—Thirty-nine Miles of Rapid Transit Construction Proposed

THE Board of Transportation of New York City on March 20 adopted additional subway routes in Manhattan, Brooklyn and the Bronx, aggregating 22.90 miles, the construction cost of which, not including track laying, station finish nor equipment, is estimated at $186,046,000.

The routes announced are to become important parts of Mayor Hylan's projected independently owned and operated system of rapid transit. They are additions to the city administration's independent subway building program as announced by Mr. Delaney last December. The figure quoted includes the boring of tunnels under the East and Harlem Rivers and Newtown Creek, but not that of the Staten Island tube nor its approaches and connections.

In the Board of Transportation's report it is estimated that construction of each mile of the new routes just adopted will involve an average expenditure of about $8,862,282.

Mere construction costs of the subways on routes adopted on March 20, together with the costs of the portions of the system approved on Dec. 9 last, have reached a total of $345,629,000.

A recapitulation of the estimated cost of the entire proposed comprehensive rapid transit development sponsored by the Mayor and as recently calculated by an administration spokesman, including actual construction, tracks, yards, equipment and station finish, indicates a grand total approaching $700,000,000.

The 22.90 miles of routes adopted on March 20 plus the 16.82 miles of routes approved last December bring the total accepted routage of the Hylan system up to 39.72 miles. Including double and quadruple track lines, the accepted track mileage amounts to 118.60.

The board's estimated cost of each route, together with the route and track mileage, is shown in the accompanying table.

These figures do not include shops, yards or equipment. The report points out that the most costly items in the estimates' expenditures are the tunnels, three of which will be under the East River, one under the Harlem River, one under Newtown Creek and another under the Gowanus Canal.

In his report to the Board of Estimate and Apportionment Chairman Delaney said:

> The Brooklyn crosstown line will be two tracks: the Culver line extension will be four tracks as far as the Jay Street tunnel; then two tracks under the river to Rutgers, Essex and Houston Streets.
>
> The Bronx Concourse line will be three tracks in Manhattan and under the Harlem River, and four tracks in the Bronx. The Fort Washington Avenue-Broadway-216th Street extension will be two tracks.
>
> It is anticipated that detail drawings of the Brooklyn crosstown line will be ready for contract bids before summer.
>
> The routes adopted and estimates of cost will be forwarded to the Board of Estimate and Apportionment as soon as completed.
>
> The engineers of the board are nearing completion of their studies for the Queens extension from the Union Station at Nott and Jackson Avenues, Long Island City, to Jamaica.

Although the bare construction of the routes, so far as they have been adopted, is only $345,629,000, the final total cost will far exceed that sum. In the course of the inquiry before Justice John V. McAvoy experts testified that it would require a sum equal to about one-half of the mere construction cost to lay the tracks, finish the stations and provide rolling stock and other equipment. This would put the additional cost of the independent municipal system, as now proposed, at about $175,000,000, and this, in itself, would bring the grand total up to $520,000,000 for the routes covered only in the Board of Transportation reports of last December and of March 20.

Route	Estimated Cost	Route-Miles	Track Miles
Brooklyn crosstown.....	$64,884,000	9.24	19.18
Culver line extension.....	60,000,000	5.77	22.44
Bronx-Concourse.....	38,681,000	4.85	12.20
Houston-Essex and Rutgers Streets.....	17,337,000	2.08	6.26
193d-216th Streets.....	5,144,000	0.96	1.92
Total.....	$186,046,000	22.90	62.00

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The Interborough Rapid Transit Company, New York, will appeal for protection to the courts if ordered to extend the local subway platforms as recommended in the McAvoy report. The company estimates the cost of the entire work at $28,000,000 and says that it has not the money to pay its share, under its contract with the city. This subject was considered again at a hearing before the Transit Commission on March 23, when the company presented detailed estimates of the cost of extending these platforms, of other obligations under its contract and of its probable earnings and expenses during the coming year. At the close of this testimony, the meeting was adjourned to allow representatives of city and commission to examine the figures and later cross-question the company representatives.

Chairman McAneny presided. He declared that there was no question that the company must carry out its contract obligations, but there was always a question whether any order issued to it was just and reasonable, and the company had a right to appeal to the courts in any particular case for the meaning of the words "just and reasonable." He also thought the financial condition of the company should be considered in determining what was just and reasonable. For that reason the testimony presented at the hearing was pertinent to the question.

During the early part of this week, the Interborough securities were subject to heavy pressure on the New York Stock Exchange. On Monday I. R. T. stock sold at 13⅛ as compared with a high of 34½ during 1925, and the 5 per cent refunding bonds sold at 59½ compared with a 1925 high of 74½. The drop in Manhattan Elevated stock was even greater. The guaranteed stock fell to 65 from the 1925 high of 100 and the modified guaranteed stock to 32⅜ from a 1925 high of 51¼. Owners of the guaranteed stock did not accept the suggested reduced guarantee in 1922, whereas the holders of the modified guaranteed stock did accept the modified guarantee. Mr. Quackenbush, general attorney for the company, declared on March 22 that there would be no receivership for the company pending judicial determination of the company's obligation to lengthen the local subway platforms.

Fate of Missouri Bus Bill in Balance

The McCawley measure, designed to provide for state control over buses operated in Missouri, has passed the Senate, but is in for a sharp fight in the House. Opinions concerning the probability of its passage are divided, but Senator McCawley has already prepared a "short bill," which he will try to rush through if the full measure fails. The "short bill" merely provides that buses shall be declared common carriers under the terms of the act creating the Public Service Commission.

The governing idea behind the original bill was to give the State Public Service Commission exclusive regulatory authority. A certificate of convenience and necessity would not give an exclusive right to a route and the commission could grant a certificate to a railway to operate buses over a route on which buses were already operated.

Philadelphia Rapid Transit Explains

Sees "Power in Coils of the Octopus" —Resents Recent Malingering of Mitten Management

Service Talks, published by the Philadelphia Rapid Transit Company, Philadelphia, Pa., says Drexel & Company have found in the Philadelphia Electric Company a choice morsel through the hold of the bankers on an option on the Conowingo power development, through which it is proposed to harness the waters of the Susquehanna for the manufacture of electricity. According to *Service Talks*, it is now planned that Philadelphia Electric surplus shall be so used up in the Conowingo project that millions of dollars will go to the bankers by way of profits and commissions. Says that paper:

P. R. T. was in desperate straits in 1910. The attorneys for the management, fearing the effect of bankruptcy, prevailed upon Mr. Stotesbury, through the pretext of a stockholder's petition, to assume financial responsibility for the property. Mitten Management came to Philadelphia in 1911 at Mr. Stotesbury's request and after examining the property and seeing its possibilities, promised, if given absolute authority in all things, to rehabilitate the property and make it a credit alike to the community, the employees and the company. Mitten Management has now succeeded, but for the first ten years the bankers' domination stood in the way of the complete achievement possible of attainment for public, employees and owners.

As the building up of the property proceeded, the strangling influence of the banker group increased in proportion. The last straw came in 1920, when the Stotesbury interests forced the increased fare—against the protest of Mitten Management—in order to advance their selfish ambitions in other cities where increased fares were made difficult of attainment because of our success here with the 5-cent fare. After a long struggle, the bankers succeeded in increasing the fare, but their despicable tactics so strengthened the hand of men and management that they finally fought free from their demoralizing influence. The bankers' only interest in P. R. T. improvement was obviously to use the stabilized property to advance their own interests, instead of for the legitimate owners and employees of the company, and for the car riders. The 1920 increased fare lost P. R. T. 100,000,000 short riders, which forced the fare increase of 1924.

Service Talks says that "Mitten Management's record since 1920, when the coils of the financial octopus were thrown off, is the best evidence of what the future may hold for the owners of public utilities—honestly administered."

In discussing the question of Mitten Management *Service Talks* says in part:

Mitten Management will cost P. R. T. for 1925 an estimated $250,000—one-half of 1 per cent of gross earnings, and $100,000, representing 3 per cent of all construction expenditures, a total of approximately $350,000. These fees are for operating P. R. T. property and supervising new construction, and are used to pay the salaries and expenses of those supervising the management, some of whom have been trained in the Mitten organization, while others have been chosen for unusual skill in some branch of public utility management.

The capitalistic press endeavor to create the impression that this fee is a personal salary paid to T. E. Mitten. It is no more a salary than the 4½ per cent of gross earnings paid by the Bell Telephone Company to the American Telephone & Telegraph Company for similar services, or the 3 per cent of gross earnings which it has been proposed should be paid in the hope of securing similarly efficient operation of New York's new subways.

Mitten Management has given to P. R. T., without royalties or other charges for patent rights, all of its inventions, which include the most important improvements made in street car equipment during the past fifteen years. These embrace the near-side car, the center-exit car and the one-man car, with their many safety devices, which have been almost universally adopted elsewhere. Mitten Management's gas-electric motor bus, which bids fair to revolutionize the bus industry, comes to P. R. T. free of any cost for patents.

If Philadelphia wants the best transit system in the world, it can only get it by having the best men in the world to manage and operate it. Whatever agency gives this service surely deserves to share in the benefits—at least to the extent of its expenses—and to be in a position to pay the men who make its success possible.

In *Service Talks* distributed on March 26 the Philadelphia Rapid Transit Company indicated that it is endeavoring to obtain control of the Philadelphia Electric Company as a result of the controversy over the Conowingo power project. The statement says the "P. R. T. management's sole interest in P. E. lies in preventing the uneconomic Conowingo project being imposed upon P. E. stockholders, P. E. customers and P. R. T. car riders for bankers' profit."

Attempt to Amend Grant May Delay Kansas City Franchise

The bus franchise under negotiation for several months in Kansas City, Mo., to give the Kansas City Railways exclusive right to operate auxiliary buses on the city's streets has experienced at least two additional setbacks recently.

A bill agreed to by the Council committee in all its outstanding points was introduced into the City Council on March 16. It was expected the measure would pass the house at once and become a bona fide ordinance as soon as put through the regular Council channels.

Contrary to its presumed acceptability previous to the time of introduction for passage of the bill, an amendment was at once proposed by one of the city Aldermen to make the franchise effective only from the date the ordinance is passed and approved until six months after the receivership. As the present receivership is expected to be lifted about Dec. 31, 1925, the franchise, if approved, would probably become ineffective in a little more than a year.

The receivers doubt that the franchise as amended would be accepted with the sanction of Judge Kimbrough Stone, referee. They believe the court will not favor any plan for an investment such as is entailed in purchasing 63 buses, if the bus franchise is to run for a period less than three years. This would probably mean that the railway may not be at liberty to purchase the buses necessary to start.

Matters may, however, be changed by state legislation. The McCawley bill will, if passed, place the control of bus lines within the state in the hands of the Public Service Commission and would automatically render null and void any objections which officials of any city in Missouri may raise in regard to bus services.

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Decision Against Atlanta Jitneys Favors Railway

The battle of the Georgia Railway & Power Company, Atlanta, Ga., against unregulated jitney competition appears to have been won on March 19, when Judge George L. Bell of the Fulton Superior Court denied a petition on the part of the Atlanta Jitney Bus Association to set aside as unconstitutional the anti-jitney ordinance passed on Feb. 8 by the City Council of Atlanta.

Judge Bell ruled that the anti-jitney law was constitutional. He said he would sign a formal order dissolving the temporary injunction secured on March 8 by the jitney bus association to prevent the city from enforcing its ordinance.

The court also declined to grant a writ of supersedeas for cars of less than 17 passengers. This automatically withdraws all five and seven-passenger machines from the streets of Atlanta as soon as the order is signed.

Although the Atlanta Jitney Bus Association is planning to carry the matter to a higher court, the points of law are brought out so clearly in Judge Bell's decision as to make this seem almost a futile procedure. Moreover, many bus operators, apparently realizing the hopelessness of their case, have already abandoned their buses and have secured employment elsewhere. These men will not return to work, and it appears very unlikely that new jitney operators can be found to carry on under the present legal status of the jitney in Atlanta.

The regulatory measure at Atlanta has been referred to frequently in the ELECTRIC RAILWAY JOURNAL since the matter became acute recently. Stated very briefly, the new law provides that all jitneys be prohibited from operating on any streets where there are car lines, on streets within two blocks of and parallel to streets occupied by car lines, and on streets in the downtown district of the city in what is known as the congested area.

Denver Tramway Organizes Bus Subsidiary

Realizing the necessity of transportation lines in various parts of the city not served by the street cars the Denver Tramways, Denver, Col., has organized the Bus Transportation Company and has asked Mayor Stapleton to place upon the ballots in the May 19 election a plea that the company be given a franchise. The buses will run on regular schedule with a 10-cent fare and transfers will be issued from one bus to another. Whether or not the transfer will be good on the railway line is not yet decided. The initial equipment will be ten modern buses.

Receiver Stenger of the tramway said that if the voters acted favorably upon the franchise the company would have an opportunity to plan extensions in the future, and that if the franchise was granted the first buses would be put in operation within four or five months after election. On the question of the installation Mr. Stenger said:

> The last few years have witnessed great changes in city transportation in the combination of the gasoline engine with the old type of buses. A motor bus has been produced, and while it has not yet been developed to a point of perfection, nor to a point where it can be called standard, it has convinced many people that there is a necessity for it in connection with regular railway service.
>
> Because there seems to be some sentiment in favor of buses and with a view to meeting changing conditions, it is the intention of the Bus Transportation Company to give them a trial in Denver.

New Ordinance Introduced

Councilman Rose's Plan for Cincinnati Street Railway Provides for Initial 7½-Cent Fare

A new franchise ordinance, based upon a capitalization of $25,000,000 for the Cincinnati Street Railway, Cincinnati, Ohio, and providing for regulation of operation by the city rather than for entire control, has been introduced in the City Council by Charles O. Rose, Councilman. Mr. Rose explained that he drew the ordinance chiefly in the hope that the provisions contained might serve as a basis for settling the present deadlock over the question of passing a 25-year 7½-cent fare contract.

The ordinance would allow the Street Railroad Director to make his own decision regarding submitting any of his orders to arbitration, while the pending ordinance makes arbitration compulsory. It provides that the fare at the start would be fixed at 7½ cents for two years by Council, with provisions for revision according to the earnings of the company at the end of that period. Mr. Rose also would allow revision of the entire ordinance every five years. The fare, when low, would allow a higher percentage of return to the company than when high, thus making an incentive for the company to bring the fare down.

While the pending ordinance provides 6 per cent return on capital stock and requires that 1 per cent may be used for fare control until Jan. 1, 1928, the new ordinance sticks strictly to a return on the investment and bases the rate of return according to the rate of fare, as follows:

Fare, Cents	Return
7	6½ per cent
6½	6¼ per cent
7½	6¼ per cent
8	6 per cent
8½	5⅞ per cent
9	5½ per cent
9½	5¼ per cent
10	5 per cent

The pending ordinance fixes the initial rate at 7½ cents, subject to change every three months, based on the theory of service at cost. The new ordinance provides that Council fix the fare for one period of two years at a flat rate. The initial rate is 7½ cents; the revision of fare taking place every two years is not based entirely on cost at the time of revision, but on the expenses of the company. Special provision is made for a revision of fares before two years in case of emergency.

The brief filed with the new ordinance mentions four subjects that require special treatment — the Cincinnati & Hamilton Traction Company, bus competition, rapid transit loop and new passenger depot. It suggests surveys on each of these subjects.

Many Changes Recommended for Oklahoma Railway

George H. Clifford of Fort Worth, who has made a survey of the Oklahoma Railway, Oklahoma City, Okla., for Stone & Webster, Inc., has recommended drastic changes in operation. He would abandon the use of the terminal station in the business center and operate cars through the down town section instead of over the terminal station loop. He also recommends increased service and an aggressive selling campaign to induce the public to use the cars. He finds that automobile "pick-ups" cost the company $50,000 a year. He also recommends purchase of several new cars and reconstruction of many now in use. Co-operation of city and state authorities to prevent cut-throat bus competition is held essential.

The improvements recommended to be carried out would cost $202,500. The report says that the facilities of the company are adequate to handle service at present, and the changes suggested are recommended for convenience and economy, and in the interest of efficient operation.

Full co-operation of patrons of the railway, as well as that part of the public owning private automobiles, and city officials is the one essential to place the railway in a position to give adequate service. When the railway is rebuilt there will be no further need for the South Robinson jitneys.

Improvements in equipment include the purchase of fifteen new cars at a cost of $112,500; equipping ten of the present safety cars for both single and double-end operation, at a cost of $44,200; equipping cars with power-saving devices, to reduce operating cost, at a cost of $6,100.

Parking rules should be amended to provide that automobiles moving into and out of parking spaces can do so without blocking traffic. Mr. Clifford said:

> Our study shows that it requires seven times more space to a person to move people in Oklahoma City by private cars than by street cars, and that in addition to automobiles moving in the streets, the parking space used by them is from 25 to 40 per cent of the total street space.

Increasing the average speed of cars from 8.7 miles to 9.8 miles an hour also can be accomplished under the proposed recommendations.

The report indicates that operation of buses as an adjunct to the railway probably will not be needed for some time, but as the city develops, it probably will be found necessary to operate buses as a supplement to electric service, for cross-town or suburban service.

A bill is pending in the State Senate which, if adopted, will authorize electric railways to operate buses in connection with city and interurban car service. George A Henshaw, receiver for the Oklahoma Railway Company, plans to establish bus lines as feeders to the interurban system at Guthrie, El Reno and Norman, if the bill passes, and also, if permitted by the State Corporation Commission, to abandon certain non-paying lines in Oklahoma City and provide bus transportation in lieu thereof.

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Iowa Interurban Organizes Bus Company

The Fort Dodge, Des Moines & Southern Railroad, operating an interurban system through Boone, Iowa, will organize a bus line with $50,000 capital as the Fort Dodge, Des Moines & Southern Transportation Company, with officials of the interurban line as incorporators. The new company will establish and operate bus transportation through the same territory served by the electric lines. C. H. Crooks, president of the interurban, announcing the new corporation, said that the growing use of the automobile as a means of transportation was rapidly changing the desires of the public as to service requirements. Recognizing this fact and believing that it was the company's duty to serve the community it had determined to enter the bus business. He stated further that the bus service to be installed between the points now served by his road would be in addition to the electric service provided, and that operation of the buses would be in the hands of experienced transportation officials. The organizers of the new corporation are: C. H. Crooks, F. M. Johnston, C. M. Kelly, F. M. Steele and W. R. Dyer.

Electrification Measure Passed in Ohio

The Norfolk & Western Railway and the Van Sweringen railroad interests are said to be greatly interested in a bill passed by the Ohio State Legislature that provides methods whereby they can electrify their railroad properties. The bill gives the Public Service Commission power to make regulations for electrification of steam roads. The measure is required by the Van Sweringen interests to aid them in carrying out their plans for a new central terminal station in Cleveland. Under the franchise, roads entering the terminal must be electrified within five years after the new station is ready for use. The Norfolk & Western is understood to be considering the use of electricity on its lines within the state during the next few years.

Bus Proposal for Palo Alto Outlined

The Peninsular Railway, San José, Cal., has submitted to the City Council its plan for the substitution of buses on certain lines in Palo Alto proposed to be abandoned. Buses would be run on the same headway now used by the street cars over the route from the Southern Pacific Station or the Circle. The fare between Stanford University and the Southern Pacific station, Palo Alto, on the street cars will be the same as at present, namely, 6 cents for the one-way trip. The fare on buses will be 10 cents, passengers to be allowed to transfer free from bus to street car, but to pay 4 cents to transfer from street car to bus. The franchise for buses is to be limited to Aug. 15, 1953, the expiration date of the present franchise. If after operation for a year the revenue derived from the buses is not sufficient to pay operating expenses, depreciation, taxes and 6 per cent on the investment, it would be left to the company to decide whether the service would be abandoned. City lines in Palo Alto have been able to pay only operating expenses for several years. The city intended to improve streets in connection with paving. This would demand a reconstruction cost to the company of about $230,000. Conferences between the company and the City Council of Palo Alto followed, with the result that the company petitioned for abandonment of city lines north or east of the Southern Pacific Railway's tracks.

Some Recent Newspaper Comments

"Exit the Trolley—Enter the Motor Bus." This is the title of an editorial in a recent issue of the Detroit *Free Press* in which the statement is made: "That the trolley car as a means of transportation is already out of date is perfectly obvious." Likewise the *Free Press* says that further building of trolleys in Detroit will prove a mistake and a waste. It is "convinced that if the main arteries . . . could be cleared of their tracks, and an adequate number of motor buses substituted for the present trolley cars, the public would be more satisfactorily served." The *Free Press* was fearful about the city's purchase of the local railway from the very outset. It "warned the voters that they were purchasing a system of transportation that was fast becoming obsolete."

But these are not expressions of opinion that are isolated. Similar prattle in the daily press is encountered at almost every turn. Says a paper down in Georgia (identity unknown): "We may be called foolish for writing it but the street car—the old, clumsy, costly, noisy, weighty blunderbuss of the present day—is headed for the junk heap." In a reference to the jitney situation in Atlanta it warns the "arrogant street railway officials" to remember. On the other hand, the Toronto *Globe* says that "the day of the trolley may have gone in Detroit, but the present system will likely remain in Toronto for some years at least." But the *Globe* appears to be not altogether sure of itself, for in another place it says that "the future of the trolley car, of course, presents a grave problem for Toronto." It sees the Toronto Transportation Commission "not entirely wedded to the trolley car," despite the vast expenditures made in recent months on the railway.

As the Greenboro *Record* sees it "there is no argument against the bus." It sees an economic warfare being waged the country over between vehicles that run on rubber and those that run on rails, and it looks upon the matter as having "developed some interesting situations." However, that paper inclines to the belief that "the time is not yet come when the street cars have outlived their usefulness." Even the New York *Evening Sun*, in its issue of March 26, referred to the "present old-fashioned street railway car."

These quotations, taken at random from recent newspapers, are fairly representative of much of the comment current at the present time.

Merchants Lease Lebanon Lines for Day

Every one in the city of Lebanon, Pa., and surrounding territory rode free on the street cars on March 11. That day, from 8 a.m. to 5 p.m., the entire railway system of the Reading Transit Company, in Lebanon, was leased to the retail merchants and free transportation was provided as a means of getting more people to attend a special "Prosperity Day" sale in the stores.

The plan was suggested by officials of the Reading Transit Company to the merchants with the claim that it would increase sales. More people rode the cars than on any previous occasion in the history of the Lebanon division of the system, and the merchants had bigger total sales than were ever recorded for a single day's business.

Normal daily receipts of the railway increased about 50 per cent. Merchants leased the lines for a sum representing the average full day's receipts. The extra money received by the railway came from patrons who rode the cars prior to and following the hours during which the lease was effective. Fares were also collected from people who rode between zones on the suburban routes, the free service being restricted to those who traveled the entire distance into the city from points outside of Lebanon.

Aside from the increased revenues of the day the railway received a tremendous amount of favorable publicity in Lebanon and the surrounding towns. The company, in its own advertising, called attention to the free service, and in addition every merchant in his advertising for the "Prosperity Day" sale urged patrons to "ride the street cars." Posters were used on the street cars for several days prior to "Prosperity Day" to remind people to "Ride Free Wednesday and Shop in Lebanon."

$20,000 in Prizes Offered

Prizes aggregating $10,000 have been offered by Bonbright & Company, Inc., New York, for the best contemporary review and forecast of the electric light and power industry, to be written in the form of an article summarizing the progress of the decade 1920-1930, and dated as of Jan. 1, 1930. It will thus be, in effect, a five years' review and a five years' forecast.

The article should comprehend the development of the industry in all its phases. It should treat not only of engineering accomplishments, but include also matters affecting public relations, finance, markets, transmission and distribution of electricity, its utilization and its effect on the industrial and social structure of the nation.

Bonbright & Company, Inc., are conducting this competition in the hope and belief that such constructive analysis will prove of real value to the industry. The donors have prepared a "Data Book" of the most generally accepted statistics on the industry at present, a copy of which will be forwarded without charge to any contestant.

The American Superpower Corporation is offering a supplementary award of $10,000. The competition is open to all.

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Hylan Transit Bills Killed

Mayor Hylan's transit bills were defeated in the New York Senate on the night of March 26 by a party vote of 28 to 21.

The Legislature took a step toward carrying out the recommendations of the McAvoy report, however, when the Assembly passed the Nicoll bill taking away from the Transit Commission the power it now has to alter contracts entered into by the city administration. Its passage by the Senate is forecast.

The three bills defeated had the approval of Governor Smith. They provided for the exemption of $275,000,000 in transit bonds from the city's constitutional debt limit, the abolition of the Transit Commission and for permission to the city to own and operate a municipal bus system.

News Notes

Wants to Substitute Buses. — The Seattle & Rainier Valley Railway, through its general manager, Walter N. Brown, has applied to the Department of Public Works at Olympia, Wash., for permission to replace street cars with buses on its Seattle-Renton line. The company will use the equipment taken off the Renton line to improve its service on the line within the city. The rails to Renton will be left for freight carriers and for emergency passenger service. Rail passenger service will be maintained to Rainier Beach. The buses, the application states, will make the entire round trip between Seattle's downtown section and Renton over the same route now covered by the cars and presumably on the same half-hour schedule. The bus rate will be 20 cents between Seattle downtown and Renton and 15 cents between Bryn Mawr and Seattle. The distance between Seattle city limits and Renton is about 4 miles and the entire run from downtown 12.59 miles.

Buses Will Succeed One-Man Cars.— Buses soon will supplant one-man trolleys on the streets of the city of Geneva, N. Y., and will replace interurban cars on the Geneva-Waterloo-Seneca Falls line, according to plans announced by C. D. Skuse, superintendent of the Geneva, Seneca Falls & Auburn Railroad. Formal application will be made to the Public Service Commission for permission to abandon the trolley lines and operate two or more buses instead. The move is said to be a popular one as the buses will reach districts not now accessible to the trolley lines, notably factory and park districts. The company expects to operate 29-passenger buses. This road parallels the present trolley route.

Relief from Paving Charges Granted. —On March 12, 1925, the Governor of Montana signed a bill intended to relieve the electric railways of the State from all charges for paving except where the damage to the pavement is caused by the presence of the tracks in the highway or by the carrying out of repairs to the tracks.

Retains Attorney for Appeal.—The city of Denver, Col., declares that it has retained Harvey Riddell as special attorney to prepare its appeal from the decision of Judge Lewis relative to the Denver Tramway having a perpetual franchise over the streets of Denver and that it will carry the case direct to the United States Supreme Court.

Investigation Recommended. — In a recent report to Mayor Kendrick of Philadelphia, Pa., City Solicitor Gaffney stated that he believed an investigation should be made into the operation of the Philadelphia Rapid Transit Company. The communication was in compliance with a request by the Mayor for an opinion regarding the company's purpose to increase the dividend rate on its stock from 6 to 8 per cent and to give Mitten Management, Inc., extra compensation estimated at upward of $300,000 a year. In his letter to the Mayor Mr. Gaffney pointed out alleged discrepancies in P.R.T.'s annual report and figures submitted to the Public Service Commission at the time the company applied for the latest fare increase. He said further that he recommended, as he did in his letter of Jan. 21, the passage of an ordinance appropriating $75,000 for the carrying on by the city of such investigation. At a subsequent meeting Councilmen were divided on the advisability of granting the $75,000.

City Not Party to Suit.—Newspaper reports from Shreveport, La., state that the time has expired for the filing of opposition by the city to the petition of the Shreveport Railways asking for an increase in fares from 6 cents to 7 cents. The company petitioned for the higher fare more than 60 days ago. Following the newspaper comment that the city was too late and that the case could be proved by default, Mayor L. E. Thomas issued a statement in which he said that the city was no party to the suit brought by the company before the Louisiana Public Service Commission. He said further that the proceeding was an *ex parte* one and that the company was compelled to furnisn to the commission sufficient evidence to justify any judgment rendered.

Rates Approved. — The New York Public Service Commission has approved the amended tariff of the International Railway applying to service on the Buffalo-Tonawanda-Gratwick and Kenmore-Tonawanda lines. The rate between Buffalo and Kenmore has been changed from 7 cents cash fare, four tickets for 25 cents to 8 cents cash fare with two tickets for 15 cents. The new ruling became effective on March 19. The commission has also approved the tariff applying to passenger service on the Buffalo-Lancaster division of the International Railway, which provides that tickets sold in strips of two will be accepted on cars of this line and applied in part payment of through fares as the equivalent of 8 cents. It also provides that passengers boarding local cars in Buffalo, upon payment of the local fare and application to the conductor, will receive a transfer, which, when presented by original purchaser to a conductor on the Buffalo-Lancaster division, will entitle purchaser to a credit, equal to the local fare so paid, toward the payment of fare on the interurban.

Foreign News

London Dividends Declared

Final dividends were declared on Feb. 5, for the year 1924, on the stocks of the London Underground group of companies. The rates for the whole year were as follows:

Company	Per Cent
Metropolitan District Railway (ordinary)	3½
London Electric Railway	4
Central London Railway (deferred)	4
City & South London Railway	4
London General Omnibus Company	6

These are all at the same rates as the dividends of the previous year, except in the case of the bus company, which paid 9 per cent for 1923. The bus company dividend, unlike those of the others, is free of income tax.

German Electrification Plans

Information regarding the electrification of the German railway system was given out at a recent meeting of the German Association of Architects and Engineers in Berlin. The greatest progress has been made in Bavaria, this being largely due to the abundant water-power resources. Work is nearing completion on the electrification of the Munich-Garmisch line. Financial credits have been secured for the conversion of the Munich-Rosenheim-Kufstein line.

The projected electrification work for 1926 includes the Munich-Ratisbonne and the Halle-Magdeburg lines. At a later date it is intended to convert the Berlin-Munich lines via Progstzella and via Hof and other lines which will link up the sections already electrified in Saxony and Silesia. There are 600 km. of electrified lines now operating.

Glasgow Railways May Electrify

Electrification of the underground and surface railways in Glasgow, Scotland, is now under discussion. The Town Council's health committee has passed a resolution asking the Town Council to promote an order in Parliament providing that within a certain number of years the railways within the city should be electrified, and that thereafter no steam locomotive should be used in that area. The object of this move is to diminish the smoke, which is pronounced in Glasgow.

Some time ago electrification of the underground lines in Glasgow was considered, but was turned down on the ground that the possible traffic increase would not allow a return on the additional capital expenditure.

Tramway Passes Given as School Prizes.—A free pass on the tramcars for one year has been offered by the Tramways Committee, West Ham, England, as a prize for the best essay on the 21st anniversary of the local tramway undertaking. The second prize is a free pass for six months and the third prize a free pass for three months.

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Financial and Corporate

Valuations Before Courts

St. Paul and Minneapolis Procedures Regarded Largely as Formalities in Connection with Fare Matters

The Minnesota Railroad and Warehouse Commission and the St. Paul City Railway have appealed to the Minnesota Supreme Court from an order of Judge R. D. O'Brien of the Ramsey County District Court which required the commission to make a return to the court of its findings published March 6 as to the valuation of the property of the railway. The return was to have been made March 9, but the time was extended to March 14. An endeavor will be made to have the case advanced on the calendar for April review.

Notice of the appeal was served on Corporation Counsel C. F. McNally and his assistant, A. A. Stewart, who instituted the suit against the commission for an order to show cause, they said, in an effort to protect the rights of the public by getting a court decision as to whether the commission's valuation order is final.

The appeal comes upon the refusal of the court to quash the order to show cause, on petition of the commission, et al. It was maintained by the petitioners, the commission and Judge D. F. Simpson of counsel for the company that the findings on valuation by the commission and returned March 6 do not constitute an appealable order and that therefore there was nothing to return. They question the jurisdiction of the court on the ground no final order has been filed. The court held that until it had examined the findings it could not decide whether they constituted an appealable order.

These proceedings are another step in the commission's exercise of a function to determine a fair rate of fare.

As a matter of precaution the city of Minneapolis has appealed to the Hennepin County District Court from the valuation of $25,300,000 placed on the property of the Minneapolis Street Railway in the process of determining a proper permanent rate of fare. This is only a precaution and does not indicate the city will fight the valuation, although the company will ask a 7-cent fare instead of the 6-cent emergency rate in effect now, it is understood. The action is based on the fact that on April 30 the Supreme Court will hear St. Paul's appeal from the valuation placed in rate finding proceedings on the property of the St. Paul City Railway. City Attorney N. M. Cronin said that if the Supreme Court should hold with St. Paul that the valuation fixed by the commission on the property of the St. Paul City Railway was final the 30-day period in which the city might appeal would have gone by, and so to protect itself the city had served notice.

The Senate committee on general legislation has recommended for passage a bill introduced by St. Paul Senators allowing the Minnesota Railroad and Warehouse Commission to establish a metropolitan district of Minneapolis and St. Paul with a single rate of fare, where now there is a rate of one fare of 6 cents in either city and 12 cents for interurban traffic between the intercity political limits. This measure will complicate the rate fixing proceedings before the commission if it is passed and signed. Another bill up for public hearing transfers control of the railways in Minneapolis, St. Paul and Duluth from the commission back to the several city councils.

The first bill is opposed by Minneapolis on the ground that inasmuch as the Minneapolis Street Railway carried 51,000,000 more passengers last year than did the St. Paul City Railway under the proposed law 4.8 per cent of the riders would be benefited, or the proportion that travels from one city to the other, and Minneapolis riders would lose more than $1,000,000 a year thereby.

1,492,727,542 Ride Surface Lines

Results for Year in Chicago Considered Satisfactory—Residue Receipts $11,506,717—$92,240,480 Paid to City for the Eighteen Years of Present Contract

A YEAR of intensive expansion of facilities and energetic cultivation of customer good will is indicated by the annual reports of the Chicago Surface Lines and the companies comprising them, the Chicago Railways, Chicago City Railway, Calumet & South Chicago Railway and the Southern Street Railway. Total earnings were $58,081,700, the highest in the history of the consolidation except the year of 8-cent fare, 1922.

Residue receipts were $11,506,717, from which the deduction of 5 per cent on purchase price was $8,127,158. The net is divisible under the franchises 55 per cent to the city and 45 per cent to the companies. Thus the city received $1,611,257. The income accounts of the two major divisions of the surface lines show:

	Residue Receipts	Net Income
Chicago City Railway....	4,602,687	1,444,888
Chicago Railways.....	6,904,030	777,173

The Chicago City Railway paid four quarterly dividends of 1½ per cent each on the $18,000,000 of capital stock, the dividend amounting to $1,080,000 and leaving $364,188 to be carried to the surplus fund, which at the close of the year was $2,829,349. The company paid off $136,000 loans representing capital expenditures of previous years. The Chicago City Railway report was delivered by Leonard A. Busby, president, separate from the Surface Lines report.

The year was noted as a record breaker from the standpoint of passengers carried. Henry A. Blair, president of the Surface Lines, points out that in April, 1924, the high month, the daily average of revenue passengers carried was 2,352,285, while on Dec. 24 the staggering total of 4,657,793 (2,674,064 revenue) was registered. The percentage of revenue passenger increase was 0.64. The accompanying table shows the average and totals for four years. The increase in car-miles was 4.14 per cent.

The lines added 98 double-truck passenger cars, which brought the total to 4,008 (all kinds). Seventy-three were built in the company shops and 25 were in process of construction. The number of cars overhauled was 1,000, a record. There was an increase in the use of multiple-unit trains and in one-man cars, which are being used on fourteen routes. Under the heading operation, Mr. Blair says:

> In pursuance of our established policy of service improvement, much was accomplished during the year covered by this report. All of the 317 new cars purchased since Feb. 1, 1923, are in operation, and there was an increase of 5,000,000 in car-mile operation in 1924 and 1925 as compared with the previous fiscal period. A total of 1,000 cars was overhauled and painted, an increase of 197, or 24 per cent, over the preceding year. Practically all car schedules of the system have been rewritten, some of them several times, to secure more efficient use of equipment and to meet changing traffic conditions. Wages of the trainmen's organization were increased 3 cents an hour during the first four months of the year over a corresponding period in 1923 and 2 cents more from June 1, in compliance with the arbitration award of the previous year. Our trainmen are the highest paid platform men in the electric railway industry.

Rerouting in the loop district elimi-

EARNINGS, EXPENSES AND DIVISION OF RESIDUE RECEIPTS OF CHICAGO SURFACE LINES FOR TWELVE MONTHS ENDED JAN. 31

	1924	1923
Earnings:		
Passenger car (including M. C.)	$57,284,602	$56,986,687
Chartered cars	7,177	7,942
Newspaper cars	14,513	13,618
Freight earnings	4,786	3,023
Hospital car service	5,668	5,870
Advertising	267,773	260,804
Rents of buildings, etc.	133,083	141,343
Sale of power	234,451	95,993
Interest on deposits	114,948	126,864
Miscellaneous	14,673	13,019
Gross earnings	$58,081,678	$57,655,169
Expenses:		
Way and structures	$2,859,869	$2,682,066
Equipment	4,148,282	3,858,865
Renewals	4,646,534	4,612,413
Power—Maintenance	376,062	361,955
Power—Operation	3,466,857	3,321,683
Conducting transportation—trainmen	20,890,865	19,640,721
Conducting transportation—other	3,177,461	3,030,582
Traffic	102,793	44,208
General and miscellaneous—damages	2,439,430	2,421,517
General and miscellaneous—other	1,551,803	1,695,740
Taxes	2,915,000	3,170,000
Total expenses	$46,574,960	$44,839,753
Residue receipts	*$11,506,717	*$12,815,416
Divided:		
Chicago Railways — 60 per cent	*$6,904,030	*$7,689,249
South Side Lines—40 per cent	*4,602,687	*5,126,166

* Includes city's 55 per cent of net divisible receipts, as defined by ordinances. See accompanying tables.

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INCOME STATEMENT OF CHICAGO RAILWAYS FOR YEAR ENDED JAN. 31, 1925

Company's share (60 per cent) of residue receipts of Chicago Surface Lines	$6,904,030
Deduct: Joint account expenses	225,000
	$6,679,030
Deduct: Interest at 5 per cent on capital valuation	4,684,130
Income divisible with city of Chicago	$1,994,900
City's 55 per cent of divisible income	$1,097,195
Company's income:	
45 per cent of divisible income	$897,705
5 per cent interest allowance on capital valuation of property	4,684,130
Interest on bank balances	109,253
Interest on treasury securities	79,057
Total income	$5,770,146
Deductions:	
Interest accrued on—	
First mortgage bonds	$2,784,700
Consolidated mortgage bonds	1,711,221
Purchase money bonds	203,650
Interest on loans	52,621
Federal income tax on interest coupons	67,500
Corporate expenses and interest adjustments with Chicago Surface Lines	173,280
Total deductions	$4,992,973
Net income	$777,173

INCOME STATEMENT OF CHICAGO CITY RAILWAY FOR YEAR ENDED JAN. 31, 1925

40 per cent of the residue receipts of Chicago Surface Lines	$4,602,687
Deduct: Joint account expenses, interest on capital investment of the Chicago City Railway, Calumet & South Chicago Railway and Southern Street Railway	3,668,028
Net earnings of South Side Lines	$934,658
City's 55 per cent as per ordinances	514,062
South Side Lines' 45 per cent as per ordinances	$420,596
Less: Southern Street Railway's proportion, as per ordinance	23,132
Company's proportion	$397,463
Add: Interest on capital investment	2,780,378
Income from operation	$3,177,842
Other income	17,526
	$3,195,368
Interest on bonds and notes outstanding	1,751,180
Net income	$1,444,188
Add: Surplus at Jan. 31, 1924	2,465,160
Surplus	$3,909,349
Dividends, 6 per cent	1,080,000
Surplus at Jan. 31, 1925	$2,829,349
Percentage of net income to capital stock at par	8.02%

TRACK MILEAGE RECORD OF CHICAGO SURFACE LINES

	Total Miles Single Track 1-31-24	Extension 1924	Abandoned 1924	Net Extension 1924	Total Miles Single Track 1-31-25	*Reconstructed 1924
Chicago Railways	587.98	3.39	†0.21	3.18	591.16	25.17
Chicago City Railway	332.27	3.06	....	3.06	335.33	5.13
Calumet & South Chicago Railway	125.57	1.69	†0.07	1.62	127.19	4.57
Southern Street Railway	17.25	....	....	....	17.45	1.33
Total	1,063.27	8.14	†0.28	7.86	1,071.13	36.20

* Includes track taken up and replaced account of sewers, special straight track renewals, etc.
† Decrease.

COMPARISON OF TOTAL AND AVERAGE PASSENGERS OF CHICAGO SURFACE LINES

Year Ended	Weekday Average	Saturday Average	Sunday* Average	Total for Year
Jan. 31, 1925	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1924	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1923†	2,204,425	2,396,385	1,563,911	762,629,211
Jan. 31, 1922	2,129,217	2,251,293	1 560,310	750 515 622

* Includes holidays. † Trainmen's strike Aug. 1 to 6, 1922, inclusive.

PRE-WAR AND POST-WAR COMPARISON OF SURFACE LINES OPERATION AT CHICAGO

	1914	1924	Per Cent Increase
Gross earnings	$31,966,049	$58,081,678	81.70
Operating expenses	19,889,276	46,574,960	134.17
Operating wages	10,560,039	29,246,381	176.95
Total wages paid	12,379,615	31,921,796	157.86
Revenue passengers carried	627,731,550	830,151,540	32.25
Total rides	1,115,312,129	1,492,727,542	33.84
Average fare per revenue passenger	4.99 cents	6.90 cents	38.28
Average fare per ride	2.81 cents	3.84 cents	36.65
Trainmen in service	8,847	11,248	27.14

CAPITAL EXPENDITURES BY CHICAGO COMPANIES FOR YEAR ENDED JAN. 31, 1925

	Chicago Railways	Chicago City Railway	Southern Street Railway	Chicago & South Chicago Railway	Total
Purchase price at Feb. 1, 1924	$93,485,088	$55,485,101	$1,723,397	$11,467,541	$161,161,129
Capital expenditures during year	278,392	127,951	57,064	138,486	601,895
15 per cent on same	41,758	19,192	8,559	20,772	90,284
Increase in fluctuating assets	172,795	115,196	.....	.....	287,992
5 per cent on same	8,669	5,779	.....	.....	14,449
Purchase price at Feb. 1, 1925	$93,986,704	$55,753,221	$1,789,022	$11,626,801	$163,155,750

nated 11,000 turns a day at congested corners. The average gain for each car in getting away from loop crossings was 20 seconds.

The attitude of the city administration and the Illinois Commerce Commission was favorable and the latter adopted a policy that it was uneconomical for the company to make extensions in streets where the city has not extended sewers, water mains and other underground improvements.

Bus expansion was vigorously contested and will continue to be so contested, the report notes. Application to expand the boulevard and park bus systems into general transportation systems are pending and numerous efforts have been made to extend bus service to outlying and suburban districts. However, a number of these applications have been amended so as to eliminate routes which would compete or interfere with the Surface Lines.

In the printing department 1,895,552,000 transfers were printed at a cost of $99,959, or 5.21 cents a thousand, as compared with 1,823,183,000 transfers printed last year.

The Surface Lines were under the management of Guy A. Richardson during the period covered by the report.

A total of $92,240,480 has been paid to the city by the companies for the eighteen years under the present ordinances, including $14,458,000 for street paving, $9,102,000 for cleaning and sprinkling right of way, $5,186,000 for maintenance paving and $27,260,000 for general taxes. The major item was the city's 55 per cent of net revenue, which totaled $34,352,492 and, with interest accretions, constitutes a fund of $40,000,000, which is the impetus for a $640,000,000 municipal ownership and subway proposal now before the voters.

E. A. Cudahy an Illinois Power & Light Director

The annual meetings of the Illinois Power & Light Corporation and its subsidiary, Illinois Traction, Inc. (Illinois Traction System), were held at Chicago, on March 16. Clement Studebaker, Jr., president, presented the annual report for the calendar year 1924. It showed the progress made in the properties operating in the States of Illinois, Iowa, Kansas and Nebraska.

The old officers and directors were re-elected, with the following changes:

E. A. Cudahy, Jr., Chicago, vice-president of the Cudahy Packing Company, was elected director of the Illinois Power & Light Corporation to succeed H. E. Chubbuck, Peoria, Ill. P. C. Dings, Chicago, one of the directors, was elected treasurer, to succeed George M. Mattis, Champaign, Ill.

STATISTICAL DATA OF CHICAGO SURFACE LINES FOR THE FISCAL YEARS ENDED JANUARY 31, 1925

	1918	1919	1920	1921	1922	1923	1924	1925
Rate of fare	5 cents	5 cents	5-7 cents	6-8 cents	8 cents	8-6¾ cents	7-6¾ cents	7-6¾ cents
Revenue passengers	692,815,889	685,300,718	743,746,584	769,025,413	750,515,622	762,629,211	824,850,103	830,151,540
Passenger receipts	$34,566,601	$34,186,578	$43,417,639	$54,726,740	$59,706,412	$55,495,310	$56,986,687	$57,284,602
Total earnings	35,114,633	34,710,097	43,963,438	55,327,384	60,343,733	56,103,061	57,655,169	58,081,678
Operating wages	12,854,406	14,768,088	19,854,173	28,204,341	29,676,981	27,163,996	27,458,736	29,246,390
Other operating expenses and taxes	10,247,289	10,963,848	13,399,841	15,096,050	16,839,168	17,252,072	17,381,016	17,328,569
Residue receipts	12,012,937	8,978,160	10,709,423	12,026,992	13,827,583	11,686,992	12,815,416	11,506,717
Less: Joint account expenses	648,205	179,831	181,862	164,733	449,000	620,000	885,000	450,000
	$11,364,731	$8,499,329	$10,527,561	$11,862,258	$13,378,583	$11,066,992	$11,930,416	$11,056,717
5 per cent on purchase price	7,661,542	7,802,574	7,893,292	7,974,289	8,024,104	8,039,343	8,076,569	8,127,158
55 per cent to city	2,036,753	383,215	1,448,847	2,138,383	2,944,963	1,665,206	2,119,615	1,611,257
45 per cent to companies	1,666,435	313,539	1,185,420	1,749,586	2,409,515	1,362,442	1,734,231	1,318,301

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Comment on D. U. R. Report

Remarks of Late President Stevenson on Outlook for Company Optimistic —Statistics Disappointing

The net income of the Detroit United Railway, Detroit, Mich., for the year ended Dec. 31, 1924, after payment of all taxes and interest charges, was $302,172, including profits on the purchase of 4½ per cent bonds during 1924, used to take down payments of $150,788 made by the city to the Security Trust Company. For the year 1923 the net revenue of the company was $942,430, after deductions for operating expenses, maintenance, taxes and interest payments made on bonded and other indebtedness.

In submitting the report for the year 1923 the late E. G. Stevenson, president, expressed the opinion that there was no reason to expect any diminution of earnings that would interfere with the continuation of the payment of dividends. For the first four months of 1924 the company experienced its greatest period of prosperity as compared with any similar period since the road was operated as a purely interurban property, but from May a general industrial depression occurred which especially affected the railway. Mr. Stevenson explained that in consequence of this and of the ever-increasing competition of buses operating on routes paralleling the principal interurban railways there was a decrease of $568,024 in the gross revenue from passenger traffic alone in the last eight months of the year as contrasted with the similar period in 1923.

Said Mr. Stevenson:

The increase in the operating expenses as compared with the previous year is more than accounted for by increased wages for platform men and other classes of labor which were in effect for only a part of 1923 and by additional car mileage run to meet the competition of buses. In addition, there was an unusually large expenditure on car equipment, which is now on the whole in much better condition than for some years past; indeed, this can be said of all the company's properties.

The competition of buses became so onerous both as regards frequency of service and reduction in fares that finally in the autumn of 1924 the board, after careful consideration, decided it would be necessary to effect arrangements that would result in the co-ordination of service between the buses and the railways, and a large expenditure has been made since that time in effecting such arrangement.

The directors are glad to be able to state that they confidently anticipate very substantial savings in the operating expenses of the railways in the year 1925 as compared with 1924, and this without any impairment of efficiency or of reasonable service to the public. These savings will be brought about mainly by the operation of electric cars by one man instead of by two men, the purchase of electric power instead of generating it ourselves, the substitution of buses for electric cars in the city of Detroit for the transportation of interurban passengers between your interurban lines and your central interurban station and the co-ordination of railway and bus services on all important routes, thus very appreciably reducing the mileage run by cars and buses.

Very substantial savings in these directions have already been made and in the aggregate your directors estimate the reductions in the operating expenses of your railways in 1925 as compared with 1924 at about $800,000.

Increased passenger fares now effective will, it is estimated, result in the addition of about $350,000 in the gross revenue in the year 1925 as contrasted with 1924, assuming that there is the same volume of traffic in both years.

During the year $9,000,000 of Detroit United Railway five-year 6 per cent first mortgage collateral trust sinking fund bonds were sold. The sinking fund for these bonds is $1,000,000 per annum, payable for the first three years out of money owing by the city of Detroit for the purchase of the city lines and in addition $500,000 per annum, for five years, payable by the company. During the year $750,000 of this sinking fund became due and was paid, of which $500,000 came from money owned the company by the city and $250,000 was paid by the company. At the end of the term of this mortgage, viz., five years, it will be reduced to $3,500,000 by sinking fund payments. The proceeds of the $9,000,000 issue were absorbed mainly in retiring un-

EARNINGS AND INCOME OF DETROIT UNITED RAILWAY FOR YEAR ENDED DEC. 31, 1924

Gross earnings from operations:		
Passenger		$6,773,475
Freight and express		1,520,625
Mail		23,110
Special car		65,509
Bus		77,316
Total earnings from operations		$8,360,035
Deduct—Operating expenses before providing for depreciation		7,275,797
Net earnings from operations		$1,084,238
Add—Proportion of interest received with respect to balance owing by city of Detroit for purchase of company's city properties	$214,509	
Other income	478,415	692,924
Gross income, less operating expenses		$1,777,163
Deduct — Interest on funded and floating debt	$1,736,433	
Less — Proportion of interest received with respect to balance owing by city of Detroit credited upon the books of the company to interest on funded debt	702,710	$1,033,723
Taxes		592,055 $1,625,779
Balance—Income for the year before making provision for depreciation and contingencies transferred to surplus account		$151,384

STATEMENT OF SURPLUS OF THE DETROIT UNITED RAILWAY

Balance at Jan. 1, 1924		$4,434,786
Deduct: Adjustment resulting from compromise agreement with city of Detroit Department of Street Railways for rent of tracks and facilities, etc., applicable to prior years (net)	$175,074	
Accounts receivable written off less adjustment of terminal charges in city of Toledo applicable to prior years	11,933	187,007
Balance at Jan. 1, 1924, as adjusted		$4,247,779
Add: Income for the year ended Dec. 31, 1924, before making provision for depreciation	$151,384	
Discount on securities retired	150,788	302,172
Together		$4,549,951
Deduct: Discount and expenses on securities sold during the year	$905,385	
Premium on bonds retired during the year	246,000	
Expenses in connection with ten-year operating agreement on Wyandotte Division	19,159	
Dividends paid—3 per cent	460,750	1,631,294
		$2,918,657

PASSENGER STATISTICS OF THE DETROIT UNITED RAILWAYS

	1924	1923
Revenue passengers carried	49,354,117	53,671,114
Free transfers	3,382,125	3,895,242
Employees	915,837	930,785
Total	53,652,079	58,497,141
Receipts per revenue passenger (cents)	13.68	13.52
Receipts per total passenger (cents)	12.58	12.41

MILEAGE STATISTICS

	1924	1923
Revenue car mileage	20,219,887	18,999,260
Earnings per car-mile (cents)	41.34	46.65
Expenses per car-mile (cents)	35.98	38.12
Net earnings per car-mile (cents)	5.36	8.53
Track mileage	613.89	603.79

Conspectus of Indexes for March, 1925

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer

Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares* 1913 = 4.84	Mar. 1925 **7.26**	Feb. 1925 **7.24**	Mar. 1924 **6.93**	Mar. 1925 **7.26**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	Mar. 1925 **158.4**	Feb. 1925 **153.1**	Mar. 1924 **163.9**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Mar. 1925 **221.5**	Feb. 1925 **221.0**	Mar. 1924 **217.4**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	Feb. 28 1925 **5.28**	Jan. 31 1925 **5.04**	Feb. 29 1924 **4.91**	July 31 1920 **11.12**	July 31 1924 **3.19**
U. S. Bank Clearings Outside N. Y. City (Billions)	Feb 1925 **15.67**	Jan. 1925 **18.53**	Feb. 1924 **14.79**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures	Feb. 1925	Jan 1925	Feb. 1924	Jan. 1924	Sept. 1924
Number	**1651**	**2344**	**1572**	**2231**	**1277**
Liabilities (Millions)	**41.17**	**64.01**	**74.80**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	Mar. 1925 **210.2**	Feb. 1925 **209.7**	Mar. 1924 **224.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Feb. 1925 **160.6**	Jan. 1925 **160.0**	Feb. 1924 **151.7**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Mar. 1 1925 **13.84**	Feb. 1 1925 **13.89**	Mar. 1 1924 **12.90**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Mar. 1 1925 **201.9**	Feb. 1 1925 **204.6**	Mar. 1 1924 **190.7**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Feb. 1925 **151.4**	Jan. 1925 **154.3**	Feb. 1924 **147**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Feb. 1925 **165.3**	Jan. 1925 **167.1**	Feb. 1924 **163.9**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population.

Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials.

Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

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derlying bonds and in payment for 4½ per cent bonds that had been purchased to take over the city of Detroit payments, which bonds were placed under the mortgage to provide for payments into the sinking fund of $1,000,000 per annum for the first three years.

In addition, during the year, $1,000,000 of Detroit United Railway 6 per cent ten-year equipment trust certificates were sold, secured by new electric cars and buses purchased. The sinking fund for these trust certificates will redeem them at the end of ten years.

$2,600,000 FOR BETTERMENTS

The sum of $2,608,020 was expended during the year on additions and betterments to the properties. In addition $1,813,416 was expended on way and structures and equipment and charged to operating expenses.

Large expenditures had to be made during the year to secure the co-ordination of competing bus services, for the purchase of buses and cars, for the provision of transfer stations and other facilities in connection with the substitution of buses for cars in the city of Detroit, for the fulfillment of obligations to municipalities and for necessary additions and betterments. Mr. Stevenson quite frankly said that further financing was necessary to reimburse the treasury for these disbursements.

Deficit in February in Toledo

Despite the highest average of revenue passengers carried per day since May, 1924, February operation of the Community Traction Company, Toledo, resulted in a deficit of $1,774, according to the report of Commissioner E. L. Graumlich submitted to the board of control at its regular meeting. Gross revenue was $308,259 and operating expense $216,589. Considerable savings are shown over last year in cost of transportation, power and general expense. Maintenance ran $40,000 ahead of February, 1924, due to a clean up of job orders. Auxiliary bus service showed a loss of $1,683.

A total of 4,087,510 revenue passengers was carried, averaging 7.91 per car-mile operated. The daily average was 145,982, compared with 182,092 at the industrial peak of last year, which came in the corresponding month.

The railway was forced to borrow nearly $100,000 recently for payment of bond interest and this is reflected in an increase in interest on floating debt. There is a shrinkage in income from track rentals due to the abandonment of city service by interurban lines.

February Poor Month in Grand Rapids. — With a drop in passenger revenue of $18,708 in February under the similar month in 1924 the Grand Rapids Railway, Grand Rapids, Mich., lacked $16,699 of meeting its expenses and its allowed 7¾ per cent return on its valuation. This boosted the deficit in the equalization account to $158,747. The number of passengers carried during the month was 15.76 per cent under February, 1924. The company in December and January met its expenses and also the allowed return on its valuation.

Net Income Decreases

Duluth-Superior Traction Company Reports Elimination of Jitney Has Increased Passenger Revenue

Gross revenues of the Duluth-Superior Traction Company, operating in Duluth, Minn., and Superior, Wis., for the year ended Dec. 31, 1924, showed a decrease of $118,575, compared with the previous year. The enforcement of the bus regulatory ordinance and improved general business conditions during the last four months of the year reduced this rate of decrease. These facts were contained in the annual report of the company, recently submitted to the stockholders by A. M. Robertson, president. Operating expenses showed a decrease of $14,929. The net income, transferred to profit and loss, also showed a decrease of $81,107 compared with the year 1923. During the year $55,933 was expended for renewals and charged against depreciation reserve. Additions to property during the year took $109,296.

The president of the company says that the officers have considered bus transportation as a feeder to street car lines and accordingly on Dec. 3 of last year organized the Duluth Coach Company, which purchased and put into operation on Dec. 18 an automobile coach as a feeder to a street car line, thus serving a residence district which had previously been without any public transportation service.

The report states that unfair jitney competition existed in the city of Duluth for two years prior to the fall of 1924 in spite of every effort made by the management to bring about proper regulation. At a special election held on June 16, 1924, an initiated bus ordinance was adopted. Under this ordinance jitneys are prohibited between the hours of 6 a.m. and 10 p.m. from operating on the streets in the city upon which a double-track railway is constructed and operated. This ordinance has so far been sustained by the courts, but an appeal is now pending in the Minnesota State Supreme Court. As a result of this jitney elimination the company's passenger revenue has been materially increased.

Mr. Robertson called the attention of the stockholders to the report for the year 1923, on the special master's report in the company's rate case then pending in the United States District Court. The case came up for argument before the court on the exceptions to the master's report on June 4 and 5, 1924, and on Dec. 29, last, the court decided that "the fair value of the property in Duluth as of Dec. 31, 1921, was increased from $4,600,000 to $5,009,510." The state commission's finding that the company was entitled to a rate of return on the fair value of the property of 7½ per cent was sustained. The temporary injunction permitting the collection of a straight 6-cent fare and restraining the enforcement of the commission's rate of 6 cents cash and five tickets for 25 cents was made permanent.

The number of revenue passengers carried in 1923 was 31,343,815, compared with 29,204,274 in 1924. The average total of all tracks reduced to single track during 1924 was 108.32 miles.

DULUTH-SUPERIOR TRACTION COMPANY —CONSOLIDATED INCOME STATEMENT

	1924	1923
Total railway operating revenues	$1,789,402	$1,904,606
Railway operating expenses:		
Way and structures	$206,146	$220,200
Equipment	194,919	188,997
Power	175,939	170,738
Conducting transportation	689,660	695,460
Traffic	967	751
General and miscellaneous	228,404	233,850
Transportation for investment—credit	—9,980	—9,009
Total railway operating expenses	$1,486,058	$1,500,987
Net revenue railway operation	$303,343	$403,618
Taxes assignable to railway operation	$113,313	$134,991
Operating income	$190,029	$268,627
Non-operating income:		
Income from funded securities	$8,713	$9,088
Income from unfunded securities and accounts	2,050	4,694
Income from sinking fund and other reserves	14,199	14,203
Miscellaneous income	397	743
Total non-operating income	$25,359	$28,730
Gross income	$215,389	$297,357
Deductions from gross income:		
Interest on funded debt	$172,651	$173,637
Interest on unfunded debt	127	.....
Miscellaneous debits	606	609
Total deductions from gross income	$173,385	$174,247
Net income transferred to profit and loss	$42,004	$123,110
General mortgage sinking fund payment	$23,912	$25,284

North American Company Has Its Best Year

The North American Company, New York, finished 1924 with the largest gross and net incomes in its 35 years history. Gross earnings for 1924 were $80,117,255, an increase of $4,651,988, or 6.16 per cent. Net income from operation was $29,955,492, an increase of $2,779,423, or 10.23 per cent. This increase in net income from operation is approximately 60 per cent of the increase in gross earnings. Of net income from operation, electricity and heating supplied 80.21 per cent, railway 10.37 per cent, gas 3.51 per cent, and coal and miscellaneous 5.91 per cent. Among the properties controlled are the Milwaukee Electric Railway & Light Company and the East St. Louis & Suburban Railway group.

Balance for depreciation reserves, dividends and surplus increased from $16,253,454 to $18,378,576, or after deduction of dividends on preferred stock, an increase of from $5.70 to $5.83 per share of common stock outstanding at the close of 1923 and 1924 respectively. After all charges for depreciation reserves and dividends on preferred stock consolidated earnings were equivalent to 31.6 per cent of the par value of North American common stock outstanding on Dec. 31, 1924. In December, because of favorable market conditions, more than $19,000,000 of financing was done for subsidiaries in anticipation of 1925 construction requirements, but no earnings are yet available from the proceeds thereof.

Expenditures for maintenance of the

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plants and system of the subsidiary companies were $5,789,024, all of which were included in operating expenses and $7,795,811 additional was appropriated for reserves for depreciation.

A world's economy record is believed to have been attained in the steam generation of electricity. At any rate, the North American system was able to reduce its operating ratio more than 2 per cent below 1923, despite an increase of more than 5 per cent in taxes, for which an amount equal to more than 8 per cent of gross was expended or set aside. The system's generating stations as a whole produced 9.3 per cent more energy in 1924 than in 1923, with a coal saving equivalent to 330,000 tons, or 15.9 per cent.

Purchases made or arranged in 1924 included 99 per cent of the common stock of the Peninsular Power Company, operating in Wisconsin and Northern Michigan; the 23-story office building at 60 Broadway, New York, in which permanent headquarters are now established, and two coal properties in Kentucky, the acquisition of which makes the West Kentucky Coal Company the largest in the West Kentucky field, with an annual productive capacity exceeding 5,000,000 tons.

Receivership at Detroit a Protective Measure

Hope has been expressed by Joseph W. Simard, one of the receivers of the Detroit United Railway, Detroit, Mich., that the company will soon be taken out of receivership. Mr. Simard is vice-president of the Municipal Debenture Corporation, Montreal, and is acting with the Security Trust Company, Detroit. A plan has been worked out which is expected will be successful, as it is believed that the conditions that made receivership expedient will not prevail permanently.

It was stated in Detroit that the receivership announcement occasioned little surprise in financial circles, but it had been hoped that the crisis might be delayed if not averted.

It was suggested in some quarters that the receivership might have been averted had Elliott G. Stevenson, president, lived to submit a plan of procedure intended for the recent board meeting. This meeting had been called by Mr. Stevenson and although his failing health prevented him from attending the proceeding he had hoped to keep in touch with matters by telegraph.

It is understood that Mr. Simard will divide his time between Detroit and Montreal. The plaintiff was granted a temporary injunction by Judge Simons, restraining the D. U. R. from interfering with the receivers. The petition of the Yellow Coach Manufacturing Company to the court stated that the D. U. R. owed it approximately $25,000 which was past due and that further obligations that would be due shortly would total $276,670. This indebtedness was the result of recent purchases of buses by the D. U. R.

The petition conceded that the railway's assets represent a value approximately 50 per cent in excess of all indebtedness and liabilities, but the company had no means at hand to meet its immediate pressing needs. Apprehension was expressed lest some of the creditors bring suits in respect to their claims and levy attachments and executions. This would have hampered operation and created a danger that one or more of the lines now operated as a united system might be cut off from central control and operation. It was contended as essential that the property of the defendant should not be sacrificed or broken up.

Railway Earnings Eight per Cent of Total.—For the fiscal year ended Dec. 31, 1924, the Middle West Utilities Company, with main office in Chicago, Ill., reports total gross earnings of $41,402,607. Of this amount the railway earnings were $3,362,213, or 8.1 per cent of the total. The report gives detailed statistics on the subsidiary operating companies, but does not segregate the electric railway operation from its other utility operations.

Will Pay Bonds.—The $700,000 of 5 per cent bonds of the Butte Electric Railway, Butte, Mont., due March 1, were paid off at maturity, at the office of W. A. Clark & Brothers, Butte, Mont.

Another Property for American & Foreign.—Interests associated with the American & Foreign Power Company, Inc., New York, have bought control of the Empresa de Luz i Fuerza Electrica, S. A., serving with electric power and light and electric railway the city of Guayaquil, Ecuador.

Preferred Stock to Be Sold.—At the recent annual meeting of the stockholders of the Puget Sound Power & Light Company, Seattle, Wash., a new issue of 40,000 shares of preferred stock was authorized. The stock will be sold from time to time to furnish money to enable the company to carry on its new construction of substations, transmission and distribution lines.

Submits Purchase Offer.—The Illinois Power & Light Corporation has offered to purchase the Galesburg & Western Railroad, Rock Island, Ill., from county, township, city and school officials, with whom rests responsibility for ordering such a sale. The Illinois Power, it is understood, will utilize the right-of-way for the building of its 66,000-volt transmission line from Galesburg to Monmouth. The interurban condition is such that the Illinois Commerce Commission has directed immediate improvements and protective measures if the line is to continue to operate and enforcement of this order is likely to precipitate the sale order. The Illinois Power & Light Corporation has asked the Illinois Commerce Commission to permit it to suspend operations on its Galesburg-Abingdon line. The company proposes, upon formal approval of this suspension, to substitute a bus service between the two cities.

Petition to Sell Stock.—To rebuild the Interstate Consolidated Street Railway, the present owners, Hemphill & Wells, New York, have decided to issue $500,000 in stock and perhaps a proportionate amount of bonds. They have petitioned the Public Utilities Department of Massachusetts for authority to issue the stock. At the same time they desire to change the name, by dropping the word "Consolidated," so as to call it the Interstate Street Railway. Such change in name requires the approval of the state authorities. The railway is operating in Attleboro, North Attleboro, Plainville, Wrentham and Seekonk, to the Rhode Island line.

Removal of Tracks Allowed.—The Pacific Electric Railway has been authorized by the Railroad Commission to remove its tracks from Sunset Boulevard, from Gardner Junction to the end of the line at the intersection of Sunset Boulevard and Laurel Canyon Road, in the city of Los Angeles, Hollywood District. Receipts do not justify operation and an adequate bus service is being rendered by the Los Angeles Motor Bus Company.

Net Corporate Income Falls Off.—For the eight-month period ended Feb. 28, 1925, the passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., fell off from the corresponding period of last year, the figures being $7,485,501 and $7,751,230 respectively. The net corporate income was $936,832 for the eight-month period of the current year against $1,292,033 for the eight-month period ended Feb. 29, 1924.

Seeks Permit for Bond Issue.—The Georgia Railway & Electric Company, Atlanta, Ga., which owns the Georgia Railway & Power Company, operator of the railway in Atlanta and vicinity, has asked authority of the Public Service Commission to issue $599,000 in refunding and improvement mortgage bonds. The proceeds are to be used to reimburse the treasurer for capital additions and extensions made during the six-month period from July 1 to Dec. 31, 1924.

Net Income Increases.—For the eight-month period ended Feb. 28, 1925, operating revenues of the Brooklyn-Manhattan Transit Corporation and affiliated companies, Brooklyn, N. Y., were $28,384,142, against $25,990,928 for a similar period ended in 1924. The expenses increased from $17,413,748 to $18,608,755. The net income increased from $2,245,543 for the eight-month period ended February, 1924, to $3,255,476 for the eight-month period ended February of this year.

Stocks Sales Breaks Record.—The second customer-ownership stock-selling campaign held in St. Joseph, Mo., by the St. Joseph Railway, Light, Heat & Power Company closed on Feb. 28. The employees sold 4,032 shares of the preferred stock of the Cities Service Company, by which the company at St. Joseph is controlled, in ten days. A quota of 2,500 shares had been set by the New York office. The record of the first campaign was 4,024 shares.

Deficit in 1924.—Operation by the Springfield & Xenia Railway, Springfield, Ohio, during 1924 resulted in a deficit of $15,523 compared with a deficit of $3,225 for the previous year. The gross earnings fell from $106,867 in 1923 to $95,072 in 1924. Operating expenses were $104,496 in 1923 and $106,001 in 1924. The number of pay passengers carried was 373,268 for 1924. In 1923 the number was 391,427. Car-miles operated in 1924 and 1923 were 268,455 and 256,003 respectively.

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Personal Items

New Assistant Secretary of the Treasury

General Andrews, Railway Official, Succeeds Mr. Wadsworth Under Secretary Mellon

Gen. Lincoln C. Andrews, receiver of the New York & Long Island Traction Company, the Long Island Electric Railway and the New York & Queens County Railway, Long Island City, has been appointed Assistant Secretary of the United States Treasury, succeeding Eliot Wadsworth, Boston, resigned. He has perfected arrangements to hold the receiverships.

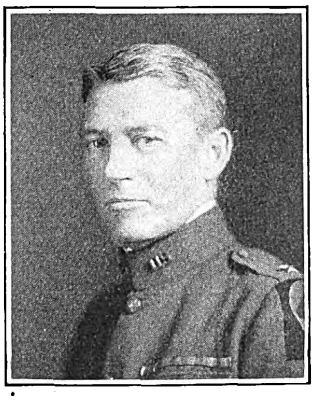
Gen. Andrews is a man of distinguished attainments. He is the second railway man in recent years to be picked by a president to occupy a place of great trust in the Treasury. Only a few years ago Oscar T. Crosby occupied a similar post under the late President Wilson.

General Andrews once said he left the regular army after the war to try his hand in business. He has succeeded in a big way. His first real experience was the year and a half he spent as chief executive officer of the New York Transit Commission. This simply served to whet his appetite for closer contact with the railways. As a result a little more than two years ago he accepted the appointment as receiver of the New York & Queens County Railway. Of all the posts around New York in the railway field this was one of the most difficult to fill acceptably. In fact, he was chaffed by his friends at that time, and welcomed by them "to the ranks of the slaves." The outlook certainly was anything but rosy. In the twenty years before the receivership the Interborough Rapid Transit Company, by which the New York & Queens County was controlled, dumped nearly $7,000,000 into the lines and got nowhere. During all these years there was a substantial operating deficit. More than $750,000 was the estimated amount needed to put the property in condition when General Andrews took charge.

But General Andrews did find it absorbing to take the sick property, work over it and see it respond. It is probable that he did many times damn the job and all that went with it, but he was back each morning with the bit in his teeth ready for another long, hard day. Doubtless he does not feel that everything desired has been accomplished, but considering the material with which he had to work he has made a wonderful record. Among many other things he succeeded in securing an advance in fare for the New York & Queens County road to 6 cents, with the understanding that for each $100,000 paving assessment charged against the company an additional cent was to be added to the carrying fee. Moreover, the general carried the case of the railway direct to the riding public. In a particularly striking announcement made about a year ago he summarized the accomplishments during the year with the defunct railway.

General Andrews did more than take into consideration the needs of the physical property and of the public. His army training made him conscious of the value of a proper personnel, but he realized the need for adjusting army tactics of discipline to the changed condition of public life. As an incentive toward greater co-operation he put into effect on the New York & Queens County Railway a profit-sharing plan which was the subject of an article in the ELECTRIC RAILWAY JOURNAL for April 12, 1924, page 583.

General Andrews is particularly well known to electric railway men in New York State through his participation in the deliberations of the New York Electric Railway Association. He is also well known to railway men elsewhere through contacts that were made by him in 1921 as a member of a party of railway men and public service commission officials that made a tour of inspection of the city railway properties as far west as Kansas City..



L. C. Andrews

General Andrews was appointed to the United States Military Academy from Seneca Falls, N. Y., in 1889 and was graduated in 1893. He was aid to General Sumner, commanding the cavalry division, in the Santiago campaign during the war with Spain and was a major of volunteer infantry in the Philippines and first American Governor of the Island of Leyte. Later he was instructor at the Military Academy and was active in officers' training work before the World War, in which he commanded a brigade in this country and in France. Later, as deputy provost marshal general in France, he assisted in the organization and training of the Military Police of the American Expeditionary Force.

E. C. Quinn is now superintendent of transportation of the Jacksonville Traction Company, Jacksonville, Fla.

Promotions Announced by Manhattan Surface Lines

Promotions have been announced by the New York Railways, New York, N. Y., as follows:

D. E. Lenahan, general superintendent.

J. Cowen, superintendent car equipment.

M. J. O'Connor, superintendent of transportation.

B. Carlin, superintendent way and structures.

H. J. O'Reilly, superintendent of transportation, resigned recently.

Dinner in Honor of Mr. Storrs

Lucius S. Storrs was guest of honor at a testimonial dinner given in the Lawn Club, New Haven, Conn., on the evening of March 23, by the officers and heads of departments to the Connecticut Company, of which Mr. Storrs is the retiring president. In a series of short addresses a number of his close associates in the company expressed sorrow at his going and yet congratulated him upon his new position of managing director of the advisory council of the American Electric Railway Association.

The dinner was presided over by J. K. Punderford, successor to Mr. Storrs as president of the company. Mr. Punderford introduced the speakers and read telegrams and letters from several guests who were unable to attend. At the close of the last address Joseph F. Berry, formerly connected with the Connecticut Company and now a member of a Hartford law firm, acting on behalf of those present, presented to Mr. Storrs a huge silver loving cup and a book of appreciation which contained the signatures of every one of the 3,800 employees of the company. On the wooden stand of the loving cup was engraved: "To Lucius Seymour Storrs from His Friends in the Connecticut Company in Remembrance of Many Years of Delightful Association, 1911-1925."

The speakers of the evening were: Charles C. Cheney, a Connecticut Company trustee; Leonard Daggett, trustee of New York, New Haven & Hartford Railroad; George D. Watrous, general counsel of the Connecticut Company; Edward M. Day, Hartford; J. W. Welch, secretary of the American Electric Railway Association; John W. Colton, editor of *Aera;* Joseph Berry.

Leslie Spraggon Superintendent of Equipment in Buffalo

Leslie Spraggon, superintendent of equipment of the International Railway, Buffalo, N. Y., as referred to in the ELECTRIC RAILWAY JOURNAL, issue f Feb. 14, is a new figure in Buffalo traction circles. Following his education in the public and technical schools of Pittsburgh, Mr. Spraggon was employed for four years by the Westinghouse Electric & Manufacturing Company in wiring, inspecting and testing railway and industrial control apparatus, railway and industrial motors and electric locomotives and in building power apparatus, but more especially railway motors, control apparatus and electric locomotives.

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In January, 1914, he became assistant master mechanic of the eastern division of the Terre Haute, Indianapolis & Eastern Traction Company and served in that capacity for more than two years. Then it was that he was appointed inspector of rolling stock with the Connecticut Company, New Haven, Conn., acting in the capacity of assistant supervisor of equipment for a period of four years. From March, 1920, to August, 1921, he served as salesman for the Westinghouse Electric & Manufacturing Company in the Boston office, handling central station and industrials. From August, 1921, until December, 1924, he was supervisor of equipment with the Connecticut Company. His return to the Connecticut Company followed the death of H. W. Beebe, who had been supervisor of equipment. In December of last year he became superintendent of equipment with the International Railway. In this capacity he succeeds George Hulme, who was made superintendent of shops.

At the time of Mr. Spraggon's appointment, mention was also made in the ELECTRIC RAILWAY JOURNAL of the election of B. J. Yungbluth as vice-president in charge of operation and of the appointment of G. W. Barker as operating manager of the International Bus Corporation, a subsidiary of the International Railway.

Organization Changes in Pittsburgh

Jurisdiction of Messrs. Phillips, Rossell and Williams Rearranged in the Interest of Improved Effectiveness of Personnel

ACCORDING to a circular dated March 1, 1925, T. Fitzgerald, vice-president of the Pittsburgh Railways, Pittsburgh, Pa., announced the appointment of F. R. Phillips to the position of general manager in charge of operations. Mr. Phillips' former title of mechanical and electrical engineer is abolished.

Effective the same date, Mr. Phillips announced the appointment of W. T. Rossell to the newly created position of superintendent of maintenance. In this position Mr. Rossell, reporting to the general manager, will be in charge of all maintenance, track, equipment, shops, carhouses, overhead lines and substations. Oscar Williams was appointed to fill the vacancy caused by Mr. Rossell's advancement.

In essence, this amounts to the creation of two general managers, one charged with the operation of the property, the other charged with the maintenance of the plant and equipment.

The commercial manager and the research manager continue to report to the vice-president.

Mr. Phillips is prominently known in the electric railway industry. For many years he was master mechanic of the Cleveland Railway, a position which he held until he went to Pittsburgh in 1909 to assist in the development of railway service in that city. He is particularly well known for his inventive work, being the originator of a number of railway devices. He has also appeared as an expert in proceedings before public bodies in which expressions of opinion on moot points were sought from an authoritative source.

Mr. Rossell became superintendent of way of the company at Pittsburgh last July. He has been connected with many large railway companies and prior to going to Pittsburgh was connected with the city railway in Cincinnati.

Mr. Williams has been a resident of Pittsburgh most of his life. He entered the employ of the Pittsburgh Railways in 1902 and has been connected with that company ever since.

Each of the new officers has been the subject of a biographical sketch published within the last few years in the ELECTRIC RAILWAY JOURNAL in connection with appointments made previously at Pittsburgh.

F. R. Phillips

W. T. Rossell

Oscar Williams

P. C. Dings, a director of the Illinois Power & Light Corporation, Chicago, Ill., has been elected treasurer of the company to succeed George M. Mattis.

C. R. Winkler, power salesman for the Arkansas Central Power Company, Little Rock, Ark., and secretary of the local electric club, has gone to Jackson, Tenn., where he will be in charge of the commercial department of the Jackson Railway & Light Company.

W. Nelson Smith, consulting electrical engineer of the Winnipeg Electric Company, has returned to Winnipeg, Man., after a leave of absence of about a year in Vancouver, B. C., where he assisted the Sydney E. Junkins Company, Ltd., in preparing a report on the electrification of the mountain district of the Canadian Pacific Railway. Mr. Smith's experience in steam railway electrification reaches back more than 20 years. After designing a number of long interurban railway systems, he took a leading part in laying out the electrifications of the Erie Railroad at Rochester, N. Y., and the Long Island Railroad. Mr. Smith is now engaged in a valuation of the extensive light and power distribution system of the Winnipeg Electric Company.

Obituary

George F. McKay, secretary of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., died on March 21 while en route from his office to his home. Since last year Mr. McKay has assumed the rôle of secretary as successor to Thomas Mason. Early in his career Mr. McKay entered the service of the Lake Shore & Michigan Southern Railroad in the traffic department. Later he became manager of the Erie *Dispatch*, which position he held for a number of years. He then accepted a position as traffic manager of the Lackawanna Steel Company, Buffalo, N. Y. He resigned this position several years ago to look after his personal interests in the chemical business. On Jan. 16, 1924, he became connected with the Washington, Baltimore & Annapolis Electric Railroad in the capacity of secretary, holding this position up to the time of his death. He was 64 years old.

Charles C. McBride, treasurer of the West Penn Company, the West Penn Railways, the West Penn Power Company and subsidiary companies, Pittsburgh, Pa., died March 13.

Logan Grant McPherson, economist and railroad authority, died on March 23 at St. Luke's Hospital, New York City. He served as chief statistician for the Rock Island System in 1904. The following year he became assistant to the late Samuel Spencer, who represented the associated railways of the United States. On the invitation of a committee of American railway presidents he organized the Bureau of Railway Economics in Washington in 1910 and was its director until 1914. Mr. McPherson was 62 years old.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Procedure of Federal Trade Commission Revised

Considerable reduction in the activity of the Federal Trade Commission is forecast by the recent change in its rules of procedure. Henceforth the commission will proceed only with those cases where the interests of the public are substantially involved. It will refuse to interfere in controversies between competitors where redress can be effected through the courts. Moreover, the respondents will always be granted an informal hearing before the complaint is issued and the case will be dismissed if there is a voluntary cessation of the unfair practice. Two cases have already been dismissed under the new rules and well-informed opinion in Washington is that the number of complaints issued will probably be reduced about 80 per cent.

A further decrease in the commission's activity may be expected as the result of a rider attached to a recent appropriation bill. This would require the assent of both houses of Congress to resolutions directing special investigations unless the inquiry is made necessary by a violation of the anti-trust laws.

First Grand Rapids Test Car Delivered

The first of three cars which are to be subjected this spring to competitive tests has been received by the Grand Rapids Railway, Grand Rapids, Mich. This car, or as the local railway officials prefer to call it, "electric motor coach," was made by the Light-Weight Noiseless Electric Car Company. The other two are being made by the St. Louis Car Company and the Kuhlman Car Company. These are expected to be delivered within the next two weeks.

L. J. DeLamarter, vice-president and general manager Grand Rapids Railway, and other officials made a preliminary test of the car and then ordered it to the shops for certain minor changes and additions to equipment. It is planned to install meters on all three cars to check every phase of their operation during the test. The first tryout indicated a substantial reduction in power consumption.

A reduction of 33,500 lb. has been made in the weight of the first car from that of the cars now being operated in Grand Rapids. It is constructed with heat-treated steel, specially prepared Haskelite veneered wood panels and aluminum to reduce the weight without impairing the strength and durability of the body. The axles are bored with a 2¼-in. hole throughout their length. Metal has been removed from the wheels by boring eight 3-in. holes in the web. This process is expected also to reduce noise due to vibration of the wheel. Roller bearings for journals and armatures are designed to provide quicker acceleration and to facilitate coasting. Automobile-type drum brakes are used on all four axles.

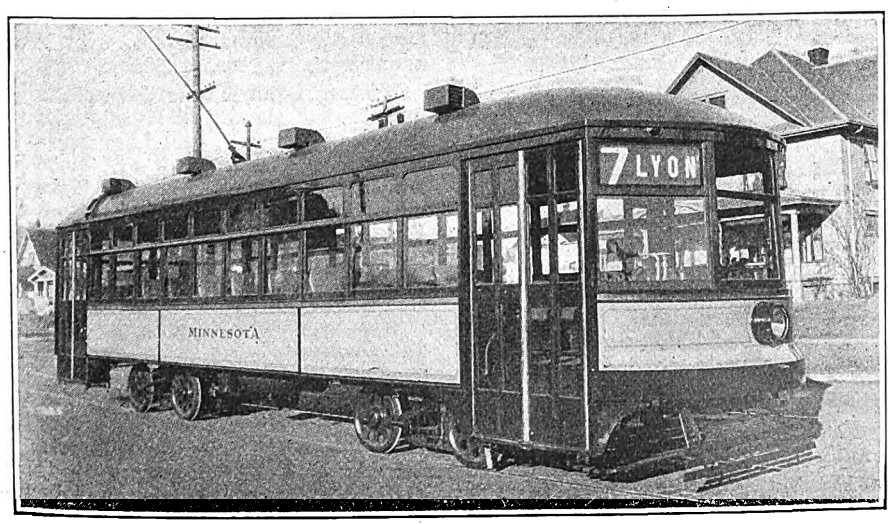
A new type of electric lighting arrangement designed by a member of the railway staff has been installed. This is intended to give the greatest intensity of light at the level of the eye of a seated passenger. The inside trim of the car is mahogany. The seats are wide with plenty of knee room and are of rattan stained green. The windows of the car are exceptionally wide and open upward. Low arm rests are provided.

The new cars are designed and equipped to be operated as single units with one trainman, or with a motorman and conductor as the density of traffic may require.

Door opening and closing at both ends can be controlled from the front platform. A comfortable seat specially designed is provided for the operator.

A feature of this first car is its outside coloring. It is painted in the colors of the University of Minnesota and carries the name "Minnesota" on the sides. The other two cars will be painted in the colors of the Ohio State and St. Louis Universities. Construction details are given in the accompanying table.

Date order was placed	Sept. 24, 1924
Date of delivery	March 24, 1925
Builder of car body	Lightweight Noiseless Electric Car Co.
Type of car	Closed passenger
Seating capacity	43
Total weight	24,500 lb.
Length over all	37 ft. 6 in.
Truck wheelbase	4 ft. 6 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	10 ft. 5 in.
Body	Haskelite
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air Brakes	Safety Car Devices Co. concentric clasp axle drum type
Armature bearings	Hyatt roller
Axles	Tubular
Bumpers	Lightweight-Noiseless Electric Car Co.
Car signal system	Faraday
Car trimmings	Lightweight-Noiseless Electric Car Co.
Center and side bearings	Lightweight-Noiseless Electric Car Co.
Conduits and junction boxes	Crouse-Hinds
Control	G.E. K-35-KK
Couplers	Lightweight-Noiseless Electric Car Co.
Curtain fixtures	National Lock Washer No. 86
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic Co.
Fare boxes	Woods
Fenders	H. B. lifeguards
Gears and pinions	G.E. Grade M.
Hand brakes	Peacock staffless
Heater equipment	Railway Utility
Headlights	Crouse-Hinds
Journal bearings	Hyatt roller
Journal boxes	Lightweight-Noiseless Electric Car Co.
Lightning arresters	G.E. aluminum cell
Motors	Four G.E. No. 258, inside hung
Paint and varnish	Sherwin-Williams
Sanders	Keystone
Sash fixtures	National Lock Washer
Seats	Lightweight-Noiseless Electric Car Co.
Seating material	Rattan
Springs	Elliptic
Step treads	Kass
Trolley catchers	Ideal, No. 10
Trolley base	Ohio Brass, Form 1
Trolley	Wheels
Trucks	Smith No. 12
Ventilators	Railway Utility
Wheels	26-in. steel
Power-saving device	Economy meter



First of the Three Test Cars Being Built for the Grand Rapids Railway

Colorado Railway to Be Improved

The Southern Colorado Power Company, Pueblo, Col., will spend about $1,000,000 this spring for betterments. The work will include improvements to the car tracks in Pueblo, the erection of substations and the placing of larger capacity generators.

Metal, Coal and Material Prices

Metals—New York	Mar. 24, 1925
Copper, electrolytic, cents per lb.	14.00
Copper wire base, cents per lb.	16.50
Lead, cents per lb.	8.93
Zinc, cents per lb.	7.65
Tin, Straits, cents per lb.	53.875
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.375
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.75
Weatherproof wire base, N.Y., cents per lb.	19.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.12
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.1272
Turpentine (bbl. lots), N. Y., per gal.	0.935

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Power Show to Feature Heating and Ventilating Equipment

Heating and ventilating equipment will form one of the large sections of the Fourth National Exposition of Power and Mechanical Engineering to be held in the Grand Central Palace, New York City, from Nov. 30 through Dec. 5, 1925. At the present time 95 manufacturing concerns have signed contracts for space in which to exhibit all types of forced-draft apparatus, heating devices, ventilating equipment and temperature regulators, as well as instruments and fittings used in the heating and ventilating field.

Rolling Stock

Ohio Public Service Company, Mansfield, Ohio, recently placed in service two light-weight, single-end interurban cars built by the G. C. Kuhlman Car Company.

Georgia Railway & Power Company, Atlanta, Ga., has announced specifications on the twenty new cars mentioned in ELECTRIC RAILWAY JOURNAL, issue of Feb. 21, 1925. The details follow:

Date of delivery	Jan. to Feb., 1925
Builder of car body	Cincinnati Car Co.
Type of car	Double-truck, double end, city
Seating capacity	48
Total weight	35,000 lb.
Bolster centers, length	20 ft. 6 in.
Length over all	46 ft. ½ in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 3 in.
Height, rail to trolley base	11 ft. 8 in.
Body	All steel
Interior trim	Natural cherry
Headlining	Agasote ¼ in.
Roof	Monitor
Air brakes	Westinghouse
Axles	Quenched and tempered
Bumpers	Anti-climber, Cincinnati Car Company
Car signal system	Consolidated
Car trimmings	Statuary bronze
Center and side bearings	Oil-retaining slide
Control	K 35JJ
Destination signs	Keystone ILR
Door-operating mechanism	Sliding door
Lifeguards	H B, Atlanta type
Gears and pinions	GE long and short addendum
Hand brakes	Peacock staffless
Heater equipment	Consolidated. panel type
Headlights	Crouse-Hinds 28569
Journal boxes	MCB Symington
Lightning arresters	Aluminum cell
Motors, type and number,	Four GE No. 265-A, inside hung
Registers	Ohmer
Sanders	Ohio Brass No. 1
Sash fixtures	Rack and pinion
Seats	H & K, AWO 400
Seating material	Cane
Slack adjuster	American Brake Company, Form E
Step treads	Aluminum
Trolley catchers	Ohio Brass
Trolley base	O. B. Form 1
Trolley wheels	Nuttall
Trucks	Cincinnati Car Company (AB, 64 D)
Ventilators	Monitor sash
Wheels (type and size)	26-in. cast iron

Oklahoma Railway, Oklahoma City, Okla., will improve its equipment if the recommendations made by G. H. Clifford, acting as consultant, are carried out. These improvements include the purchase of fifteen new cars at a cost of $112,500, equipping ten of the present safety cars for both single and double operation at a cost of $44,200 and equipping cars with power-saving devices to reduce operating cost, at a cost of $6,100.

Denver Tramway, Denver, Col., will purchase ten buses in line with plans it has developed, to which reference is made elsewhere in this issue.

United Railways, St. Louis, Mo., has ordered five six-wheel buses from the Six Wheel Company, 1880 Lehigh Avenue, Philadelphia, Pa. The chassis is furnished by the Philadelphia Company, but the bodies of the buses are bought at St. Charles, Mo. The buses will be given a thorough trial on the St. Charles-Wellston line.

Stark Electric Railroad, Alliance, Ohio, has purchased two de luxe buses costing about $15,000 each. These supply continuous service between Alliance and Canton.

Track and Line

Connecticut Company, New Haven, Conn., will lay tracks in Hamilton Street from Chapel to Water Street and also in East Street from Water to Chapel Street. The company has also been granted permission to extend the Winchester Avenue track from Read Street to the Hamden line.

Seattle Municipal Railway, Seattle, Wash., is now in the market for $90,000 steel rail and special trackwork layouts A. F. Pierce, superintendent of construction, has completed plans for the special layouts and specifications covering the 400 tons of 80-lb., 7-in. T-rail desired. The rails will cost $25,000 and the special work about $65,000.

Pacific Electric Railway, Los Angeles, Cal., has completed the installation of a new double track curve connection at Ninth and San Pedro Streets, at a cost of $32,000. The new curve will permit the handling of freight traffic on San Pedro Street and make possible the serving of industries to be located in the industrial district between Ninth and Aliso Streets. This will permit freight service to the new Westinghouse Electric & Manufacturing Company plant recently established on San Pedro Street.

Shreveport Railways, Shreveport, La., will extend its line into the new Broadmoor subdivision if the engineers making the preliminary survey believe the extension is practical.

Puget Sound Power & Light Company, Seattle, Wash., will begin work immediately on replacing 60-lb. rails on West Holly Street with 93-lb. rails and the paving of its right-of-way on this street in Bellingham between the alley below Bay Street and B Street.

Power Houses, Shops and Buildings

Milwaukee Northern Railway-Wisconsin Power & Light Company recently opened up their new joint terminal at Sheboygan. The new terminal, modern in every detail, was designed to take care of the future growth of traffic. The main portion of the interior comprises a large waiting room. A pleasing feature is the loading and unloading of trains under the canopy.

Wheeling Traction Company, Wheeling, W. Va., is erecting a new terminal in Steubenville.

Trade Notes

Edgar C. Walthall has joined the sales organization of the Boiler Equipment Service Company, Candler Building, Atlanta, Ga., district engineers of the Conveyors Corporation of America, 326 West Madison Street, Chicago, Ill. Mr. Walthall was graduated from the Georgia Institute of Technology and was recently superintendent of the fire brick plant of Stevens, Inc., at Stevens Pottery, Ga. He is experienced in marine and heating engineering.

Wollmar Engineering Corporation, New York, N. Y., has appointed A. J. Gillespie sales representative for its Cleveland office for N. K. A. ball and disk bearings. He was for more than six years in the ball bearing industry in Ohio, having been district manager for Hess-Bright and S. K. F. and for the last three years in anti-friction engineering in his own business and president of the A. J. Gillespie Company. His headquarters will be at 8500 Lake Avenue, Cleveland, Ohio.

Universal Crane Company, Cleveland, Ohio, has appointed the Factory Products Company, 204 Oliver Building, Pittsburgh, Pa. its representative covering the Pittsburgh territory. W. W. Adams, president of the Factory Products Company, has been identified with the sale of locomotive cranes since 1907.

William Pestell has been made a vice-president of the Riley Stoker Corporation, Worcester, Mass., and will continue to have supervision of all sales for the Riley Stoker Corporation. Mr. Pestell is widely known in the power plant field because of his many years experience in charge of mechanical and electrical equipment with the Lynn & Boston Railroad, the Worcester Consolidated Street Railway, the United Electric Railways of Providence and the Allis-Chalmers Company, Boston. Mr. Pestell also spent several years as a mechanical engineer for the J. G. White Engineering Corporation. He is a fellow of the American Institute of Electrical Engineers and a member of the American Society of Mechanical Engineers. He has been connected with the sale of Riley stokers from the start of the company, first as Western sales manager, with headquarters at Chicago, and since 1921 as sales manager, with headquarters at New York and Worcester, Mass.

William Bonn, formerly plant superintendent of the auto body plant of the Pullman Company, and later assistant general sales manager, has been appointed assistant general manager, with headquarters at Chicago, of the W. M. Lalor Company, railway sales representatives of the Zapon Company, manufacturer of leather cloth, lacquers and enamels.

Mack Trucks, Inc., New York, N. Y., has purchased a square block in Jersey City on which the company will erect a large plant. Officials explain that the Jersey City site was decided upon because of the benefits for deliveries in Greater New York through the New York-New Jersey vehicular tunnel. The cost of the plant is not known.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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MORRIS BUCK, *Managing Editor*

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The New Era Begins for the American Association

A RED-LETTER day in the annals of the American Electric Railway Association is April 2, 1925, for on that day the new managing director, Lucius S. Storrs, formally took office. Coming as he does from a large property where he has made an enviable record, he has an excellent background to work on. Many problems await him. Financing electric railways deserves close attention. Securing better public relations, and telling the railway men how to present their side of the picture, is another problem. The adoption of the latest transportation tool, the bus, helping to see it in its true perspective and give it the proper place as an integral part of co-ordinated transportation service, is still another problem—and one of major proportions. Right now the industry is confronted with the need for regulation of interstate motor traffic, which has been thrown into chaos as a result of the recent decision of the United States Supreme Court. These are just a few of the things that will demand earnest attention from Mr. Storrs.

To obtain best results too much help cannot be given the new managing director. It is only by teamwork that he will be able to accomplish maximum results. While his services will be available to every railway in the country, as well as to the public, the railways and the public can well afford to make their services available to him. The ELECTRIC RAILWAY JOURNAL pledges its full support to Mr. Storrs, and at the outset wishes him and the association the greatest of success in the new undertaking.

Everything Points to the Best Convention Ever

PREPARATIONS for the annual convention of the American Association are now well under way. Arrangements have been made on substantially the same terms as last year for the use of the facilities at Atlantic City. Nothing is in the way of bettering the performance. The space available for exhibits is limited to some 90,000 sq.ft., hence to get the most out of it every bit must be made to count.

One thing that will make the exhibits more valuable is the display of products that have been in service. A railway man likes to see the latest developments, it is true. Even more is he interested in things that have been weighed in the balance and not found wanting. In the past the exhibits that have attracted the most attention from operators have been those that showed what the part looked like after it had been used for all or a considerable portion of its natural life.

An innovation this year is the construction of a temporary track that will permit exhibitors to transport complete cars to and from the pier and vicinity with less labor than in past years and at a cost that is not prohibitive. Not only should manufacturers seize the opportunity, but operating companies should be willing to give others the benefit of their experience by the exhibition of cars that have proved successful in service. Taken off the street, they should make apparent the value of the best practices in a way better than new equipment can do.

So let every one plan to show the best he has, and make it an exhibit that will be far and away in advance of anything ever before attempted by the association.

Boston Made a Good Bargain

NINE years ago the Boston Elevated Railway was on the verge of bankruptcy. The story is familiar to all who have followed traction history. Costs mounted along with the war, but as in many other cities fares were held down to the then universal 5 cents. The consulting engineer who made a report on the finances of the company found that there was an actual deficit resulting from the operations, including only a low rate of interest on the investment. As the property was being allowed to depreciate without proper allowance for renewals, the actual loss was still greater, the total cost being 20 per cent greater than the revenue. Evidently the road was headed for a receivership. As the city of Boston was interested financially, having spent large sums on subways, it felt that its investment should be protected. Yet the city officials were unwilling to give the company the financial relief it needed to carry on.

The solution adopted was that the State of Massachusetts became sponsor for the finances of the property. Though the company continued as a private corporation, the state assumed control. For the past nine years the road has been operated by a board of public trustees. The management has been progressive and far-seeing. Fares at Boston have been increased according to a formula automatic in its operation which could not be misinterpreted. Service was improved, maintenance was taken care of, and obsolete and discarded property written off the books. While there was a deficit the first few years conditions have since improved, so that eventually the state will get back every dollar that has been advanced to make good the loss.

The excellence of the arrangement was attested by Mayor James M. Curley of Boston, speaking before the New England Street Railway Club last week. His address is published elsewhere. The city is so well pleased that now it desires to extend the contract for control of the railway system an additional twenty years. More than that, the plan is held up by the Mayor as a model that might well be copied by cities all over the United States. With such an indorsement as this, the public trustees and the men who had the vision to put the plan forward may well feel repaid for their efforts in providing the Boston district with a modern transportation system.

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Better Marking Is Needed to Indicate Bus Routes

DURING a recent visit to a small town where street railway service has been entirely replaced by buses, an editor of this paper had occasion to ask how to reach one of the local bus lines. He was directed to go down the street until he reached the car tracks, where he could get a bus.

Surely this was a strange way to give directions in a town where the bus has been substituted for the trolley car. But it illustrates an inherent advantage of the railway, and shows that something yet remains to be done by the bus men in the line of improving service.

Tracks, poles, and overhead wires are visible evidence of the location of a transportation route. Moreover, the trolley poles are usually so marked that prospective passengers know where to wait for their vehicles. Where traffic is heavy, many street railways have also adopted the practice of indicating the exact stopping places by the use of signs on the span wires or at the curb. This is seldom the case with a bus route. The advantages of having the route and stop locations clearly marked certainly justify the moderate cost of such a procedure. It is a matter that deserves the careful consideration of all bus operating companies.

Valuation Practice Must Be Clarified

THREE recent valuation decisions which have followed each other in rapid succession are deeply significant to the electric railway industry. These include the decisions of the federal courts in the Denver and Duluth cases, published in the Dec. 20, 1924, and the Jan. 24, 1925, issues of ELECTRIC RAILWAY JOURNAL, respectively. The recent findings of the Minnesota Railroad and Warehouse Commission fixing the value of the street railway properties in St. Paul and Minneapolis were published in the March 14, 1925, issue.

Each of these decisions shows an increasing insight, on the part of those charged with the review of valuation evidence, into the unsound but plausible theories that have been advanced in the past to obtain low valuations. There is a consistent rejection in these findings of the absurd and fantastic valuation and depreciation methods used by certain consultants engaged in the lucrative business of establishing junk values for railway properties.

In Denver, track which was conclusively shown by the company's engineers to be in excellent serviceable condition due to proper maintenance was scheduled by the city's consultant at a negative value. That is to say, its value was listed as less than zero, and subtracted from the total of the remaining property. Photographs introduced by the company to show the condition of this track evidently led the court to doubt the accuracy of the city's evidence.

The cities of Minneapolis and St. Paul employed different consultants. Apparently they had little confidence in each other's methods and failed to compare their figures. As an example, separate valuations on two sections of a continuous piece of track over the Mississippi River bridge were submitted. That on the east half of the bridge was scheduled as being in 80 per cent condition, while the portion on the west half of the bridge, which had received the same maintenance and had carried identical traffic, was assumed to be in 50 per cent condition.

On this same property, passenger cars built at the same time in the company's shop and used interchangeably between the two cities were found to be in 22 per cent condition by the consultant for one city and in 72 per cent condition by the other.

Such inconsistencies in the results obtained and in the values found for identical property drew caustic comment from the commission. Apparently much of the evidence submitted on this basis was discounted—and it should have been. The decisions of the courts and the commission in these recent cases, it is to be hoped, will establish additional precedents leading to more accurate statements by consultants of this class.

Central Western Meeting Suggested

MORE and more during recent years the advantages of group thinking have been demonstrated in the electric railway industry. New ideas and views on public relations, ride merchandising, safety work, modernization of plant and operating methods, financing and a host of other modern railway subjects have taken root and developed as a result of railway men getting together, comparing notes, taking stock of their situation and discussing methods of improving their practice.

The American Electric Railway Association, together with its affiliated organizations, has, of course, been the greatest single agency for bringing railway men into personal contact with each other. The various state and sectional associations have also played an important part in this interchange of ideas. They bring railway neighbors together, stimulate friendships and at the same time co-ordinate the efforts of various operators in a given territory to solve the local problems of mutual interest. In the Middle West, the Central Electric Railway Association has been an outstanding example of the value of sectional co-operative thinking and effort. More recently the railway men of Missouri, Kansas, Colorado, Nebraska and Oklahoma have formed the Mid-West Electric Railway Association.

It has been suggested that the railways in the intervening territory, comprising the states of Iowa, Illinois, Wisconsin and Minnesota might profitably hold a combined meeting once a year. Of these states, the first three each has a state utility association. In Iowa and Wisconsin, a general utility meeting is held once a year, and the railway men in each of these states get together again for a second exclusively railway meeting. The Illinois association holds only one meeting a year, which is a combined meeting of all the utilities. Minnesota has no state association.

Many large and progressive railway properties are located in this territory. By combining the railway meetings of Iowa and Wisconsin, and including the properties in Illinois and Minnesota, one general railway meeting could be held, which would be of immense value and profit to all of the properties participating. Payment of a comparatively small fee by each man who attends would afford a simple means of financing the plan. Unquestionably the benefits derived would be far in excess of the cost in time and expense.

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Continued Improvement Expected in Electric Railway Situation

A Survey of the Present Status of the Industry Made by an Official of a Large Manufacturing Company Indicates that Developments of the Past Five Years Have Put the Railways on a More Stable Basis with Bright Prospects for Future Prosperity

DIFFICULTIES experienced by the electric railways in the years immediately following the war, and the apparently growing competition of other modes of transportation, aroused speculation as to their future destiny. This caused some anxiety in the industries which depend upon the electric railways for a large portion of their business. For this reason an investigation was made for the benefit of William Wharton, Jr., & Company by Victor Angerer, vice-president, to determine the present status and future prospects of the railways. Through the courtesy of the company a summary is given below of this survey, which is supported by statistics obtained from authoritative sources.

Although in the minds of the general public an impression is somewhat prevalent that the street railway is on the wane and likely to be supplanted by other means of transportation, statistics do not bear this out. On the contrary, the survey indicates that many of the difficulties of the past have been or are being overcome. Figures show a consistent, steady though moderate growth of the electric railway business. They also show its importance and that no other mode of transportation has been found that would so adequately and cheaply meet the requirements of the public in the cities where the bulk of the electric railway business lies. A continuation of the growth of that business is to be expected for many years to come, although perhaps not in proportion to the growth of the population.

Sources of Past Difficulties

Ills from which the street railways have suffered since the war may be summarized as follows:

1. Over-expansion; in the prosperous times before the war many lines and extensions were built on speculative grounds for development of territory which later proved inadequate to support them. During the war trackage and equipment were added for traffic to and from localities which at the close of the war became dead.
2. Increased cost of operation and taxes without simultaneous commensurate increases in fare.
3. Unregulated jitney competition, in many cases fostered by a hostile public reluctant to accept the necessity for an increase in the street car fare.
4. The phenomenal increase in the number of private automobiles and taxicabs.
5. Competition of the motor bus, apparently made possible by improved highways.
6. Traffic congestion in the hearts of cities, making street car operation more costly and slower and causing passengers to desert the electric railways for other means of transportation which promise to take them to their destination more quickly.

The crisis of the ills mentioned in the first four counts was reached in 1919, when 48 street railway companies went into the hands of receivers. In the years 1918 to 1920 some 1,500 miles of track were abandoned. Considerable abandonment of trackage reported in later years was planned at that time, but actual suspension of service or dismantling of tracks did not take place until the necessary legal arrangements were completed.

The inconvenience caused by the abandonment of service on some lines and in some localities, as well as the investigations conducted by various bodies, brought the public and the authorities to a realization of the necessity for higher fares. As a result, in 1920 the average fare on the electric railways of the country had advanced to 7.5 cents from the former almost universal nickel. With this increased revenue to the railways came also a better feeling between the public and the companies and a better understanding of the dependence of one upon the other.

Congestion Is Causing Automobile Owners to Return to Public Conveyances

The unregulated jitney, while still active in some localities, has largely eliminated itself as a competitor of the railways through its own undependability and irresponsibility and perhaps through a better realization by the jitney owner of the actual cost of operating such a vehicle.

A more important factor restricting the growth of the electric railway has been the private automobile and the taxicab. The extent of this influence in city traffic and in the congested districts is almost impossible to estimate. Undoubtedly it has affected interurban travel and the once popular pleasure riding on trolley cars in the summer and on holidays. As an offset, a most remarkable increase has taken place in the riding habit much greater than the growth of the population. Despite the increased use of the automobile and the taxicab, therefore, taking the electric railways as a whole, the number of passengers carried continues to increase.

In the hearts of the larger cities the congestion created by the automobile and consequent traffic regulations and parking restrictions have largely served as a check to further growth of the use of the private automobile. This situation is inducing automobile owners to return to the public conveyance for city travel. The taxicab, no doubt, has taken a large part of this travel. It is figured that the taxicab now transports 3,500,000 people per day as against about 45,000,000 passengers carried by the electric railways. In consideration of the great difference in the rate of fare, however, the taxicab cannot be classed as a competitor of the railway. It furnishes a service that stands by itself for greater comfort and speed. Traffic congestion may again set the limits to the future growth of

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the taxicab traffic and to its function as a time saver. A conveyance more commodious than the street car and covering fixed routes, but carrying more passengers per square foot of street surface, may have to take its place. The de luxe bus may thus become a competitor of the taxicab and to some extent may even replace the private automobile for strictly city travel.

The competition of the motor bus, the survey shows, has attracted more attention to the future of the electric railway industry than has any other factor. The widespread construction of good highways and the development of the bus into a reliable motor vehicle led to bus routes being established in direct competition with the electric railways. A great propaganda for these lines was launched, mostly for exploitation and promotion purposes. Exaggerated statements in the sensational press, the somewhat hostile attitude of the public in numerous localities against the electric railways, and the public's enthusiasm for gasoline-driven vehicles are clouding sound judgment. The propaganda is still being pursued vigorously. Recently established or projected motor bus lines are heralded as replacing electric railways, but without stating that these electric lines were abandoned four or five years ago during the financial stress of the railways, or they are being substituted on non-paying lines. These statements give a wrong impression that the bus has forced the abandonment of the electric railway.

Replacements of Cars by Buses Have Been Few

According to statistics recently compiled, five electric railways have abandoned service entirely and are now operating nothing but buses. Independent bus lines have entirely superseded electric railway service in seven cases. In addition to this, buses have replaced parts of electric railway systems in a number of cases. Altogether the survey shows bus service has replaced trolley service on less than 500 miles of track. This gives an indication of the comparatively small extent to which bus service is actually replacing electric railway service. More than 2,000 miles of bus routes being operated by the electric railways themselves as feeders or auxiliaries represent new transportation facilities.

Reliable information is not available regarding independent bus lines operated in direct competition with existing railways or steam railroads. Their number is quite large but seems to have affected the steam railroads more than the electric lines. Competing bus lines in some cases are believed to have been established with the sole view of forcing the electric railway to take them over or co-ordinate the service.

The exploitation of the bus at the present rate has created the prediction that history will repeat itself. The development is going too fast and too far, courting disaster, as has been the experience with the electric railways, and with the steam railroads in the middle of the last century.

All students and investigators agree that the electric railway is the best medium known for mass transportation of passengers. In the interests of the public it must be preserved and protected against unnecessary competition, and must be the foundation of the coordinated transit system of the whole community. The necessity riders who constitute the masses want cheap transportation, and the safest and most reliable and regular transportation in all kinds of weather. The bus has not been proved equal to the electric street car in these essentials.

The economic advantages of rails to reduce tractive effort and electric transmission to reduce cost of power have been called fundamentals of the ability of the electric railway to furnish cheap transportation. The introduction of one-man cars on less frequented lines or between rush hours, lighter cars, improvements in transmission lines and permanent ways are all tending to lower the operating cost as well as to reduce the amount of capital invested.

The requirements for transportation in the large American cities cannot be compared with those of large cities in Europe, such as London, Paris or Berlin, where buses are the principal means of public surface transportation. Those cities have not the concentrated business sections with skyscraping office buildings holding the equivalent of the population of a small city which we have in this country. Their business is spread over a much wider area and the cities themselves extend from the business center in all directions. Furthermore, the number of automobiles is extremely small compared with the number on the streets of American cities. The fact that notwithstanding this easier situation there is congestion in the heart of those European cities on account of the bus traffic gives strength to the argument that to follow their example and attempt to handle surface transportation in American cities by buses instead of by street cars would create such an increase in congestion that it would prove unbearable.

American cities grow very rapidly. A comparison of the census of 1910 and that of 1920 shows that cities of from 250,000 to 500,000 population have on the average increased 40 per cent. Cities from 500,000 to 1,000,000 have increased 35 per cent. Smaller cities under 200,000 population did not increase quite so fast, the average being only 24 per cent. The larger cities of more than a million increased only 15 per cent. This growth and the increased number of riders produced thereby must be taken care of by the street railways by more frequent service on existing track systems, followed by track extensions into newly settled sections. Therein is the difference between the past and the future. In the past speculative extensions of the street railway preceded the settlement and building up of the suburbs. In the future such extensions will follow only after the new sections have been fully developed and the necessary amount of traffic is assured. The private automobile and the bus may suffice during the development, but the assurance of permanent and regular service offered by the rail lines will sooner or later be demanded.

Extensions Will Offset Abandonments

In the largest cities the problem has arisen as to when the large expenditure required for the building of rapid transit lines, elevated or subways is warranted. The actual carrying out of such plans has lagged behind the demands of growing population for additional transportation facilities. Statistics show that where such lines have been constructed they have had only a limited effect on the rate of continued increase in the number of passengers carried by the surface lines. In New York City it has been calculated that the increase in population adds more than 100,000 riders per day to the total number of passengers carried by the surface, elevated and subway roads.

There will no doubt be further abandonment of non-paying electric railway lines. This, however, is likely to be offset by the extension due to the natural growth

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of the cities. As a whole it would appear from the facts that the developments of the past five years have put the electric railway on a more stable basis than they were, with prospects of a moderate, continued growth for many years to come. Where statistical figures show a diminution in number of miles of track and number of cars operated, they really indicate a healthy deflation. Quite a number of small companies operating less than 10 miles of track have been eliminated. The large companies are firmly established and carrying a constantly increasing number of revenue passengers.

This general study of the status of the electric railway industry was made with the ultimate object of determining the probable influence of developments on the future special trackwork requirements of the electric surface railway. The conclusions reached are that the purchases of special trackwork are not likely to diminish, as some may mistakenly believe, but may be expected to be materially larger during the next few years than they have been lately.

The bulk of the requirements comes from special trackwork renewal in the paved streets of a number of cities comprising only about one-third of the total electric railway track mileage of the country. More than 50 per cent of the renewal demands are for tracks in the hearts of cities with more than 250,000 inhabitants. The permanency of these tracks is not likely to be

Determination of Special Trackwork Requirements

To arrive at the total amount of special trackwork now in service, the proportion that it forms of the total track operated on representative systems was studied. Figures obtained varied from 5 per cent on systems having a large amount of suburban and some interurban track to more than 10 per cent on urban systems. Percentages were then applied to the mileage figures of the country to give the approximate number of feet of track of special trackwork in service under the different kinds of operation. Dividing the special trackwork into its various representative units — i.e., single branchoffs, double branchoffs, crossings, crossovers, turnouts, plain curves, etc., of average dimensions—the average value per foot of track was figured, taking into consideration the type of special trackwork generally used under the different conditions.

The next and most difficult figure to determine was the life of the work under different conditions. Records and opinions of street railway engineers were consulted, as well as the records of the Wharton company of partial and whole renewals of layouts in different localities. The number of years given in the fifth item of the table are believed to represent a fair average.

In addition to the renewals there is the new work required for extensions of trackage due to the natural growth of the cities. This is still quite a factor which is not likely to be counterbalanced through any further abandonment of existing tracks in the cities.

Total figures from this calculation show that the special trackwork in service on the surface electric railways of the United States represents a present replacement value of more than $100,000,000, and that the normal annual requirements for renewals and new work should amount to approximately $12,000,000 at present-day prices. Of this sum possibly about 10 per cent represents work done by the railways themselves.

In making a comparison with the past it is seen that the urban trackage has not changed materially since 1917—extensions offsetting abandonments. Interurban trackage in the same period fell off some 1,300 miles, but this affected the special trackwork requirements in a very small way. It meant that the total amount of special trackwork in service, at present values, was reduced less than 1 per cent and the annual renewal requirements were reduced by less than one-half of 1 per cent. The potential market for special trackwork for surface railways is, therefore, the same now as it was seven years ago.

Surface railways for several years past have not fully maintained their trackwork and have resorted to many temporary repairs. Some have kept their tracks in first-class condition, but taken as a whole throughout the country they have not done so and their purchases of special trackwork material for renewals, taken as a whole, averaged not more than about 60 per cent of normal during the past five years. As the financial condition of the companies improves, their policy will probably turn to ultimate economy as the object in place of the temporary economy practiced. Temporary repairs only postpone and increase the eventual heavier expenditures, and poorly maintained trackwork adds to the cost of upkeep of the rolling stock.

It cannot be expected that the purchases of special trackwork will at once take a jump, but the prospects are that they will fairly rapidly increase in the next few years from the present low level until they reach normal and possibly go beyond normal to make up for the shortcomings in maintenance in the past.

A factor that will have considerable influence is the length of time that a piece of special trackwork can be kept in serviceable condition, without renewal and without detriment to rolling stock and motive power, by such modern means of repairs as the electric welding of worn-out parts. It is generally admitted that such repairs cannot be repeated indefinitely, but as to when they become impractical or uneconomical and whether they are economical at all when applied to certain parts of special trackwork has not been sufficiently determined.

Another important factor has lately appeared. It is the demand of the public for less noise in the operation of the electric cars. The increased noise through the restricted upkeep, of late years, of both the cars and the track has probably brought this phase of electric railway operation more forcibly to the attention of the public, especially when comparison was made with the quieter operation of the rubber-tired motor vehicle. Investigating engineers and travelers abroad have also found a very noticeable difference in the noise produced by the electric cars in American cities and the much quieter operation in the cities of Europe, where much attention is paid to the upkeep of the cars and track.

Electric railways must heed demands from their customers—the public—and to eliminate noise the track department and equipment department must work hand in hand. The first step is better upkeep. This factor is, therefore, likely to counteract the retarding influence to complete renewals of the electric welding repairs and to hasten rehabilitation. It will also undoubtedly, in time, cause some detail changes in the construction of cars and trucks and in special trackwork to a more extensive use of the higher, slower wearing types of work as well as to a demand for greater accuracy and higher finish of the work. Developments in that direction which will affect the manufacturer of special trackwork both in value and volume are to be expected.

SPECIAL TRACKWORK IN SERVICE ON SURFACE RAILWAYS AND NORMAL RENEWALS

	Paved City Streets		Unpaved Streets and Highways		Total and Averages
	Cities Over 250,000	Small Cities and Outskirts	City and Suburban	Interurban	
Per cent of special trackwork to total trackage	10	5	3	2	2.8
Number of feet special trackwork	3,000,000	2,250,000	1,650,000	1,750,000	8,650,000 = 1,638 ½ miles
Average value per foot of track	$16.00	$12.00	$10.00	$7.00	$11.38
Total value	$48,000,000	$27,000,000	$16,500,000	$12,250,000	$103,750,000
Average life — years	8	10	12	15	10
Renewals per annum	$6,000,000	$2,700,000	$1,350,000	$800,000	$10,850,000
Requirements for new track per annum	.....	$500,000	$300,000	.....	$800,000
Total estimated requirements of special trackwork for surface street railways per annum at current prices					$11,650,000

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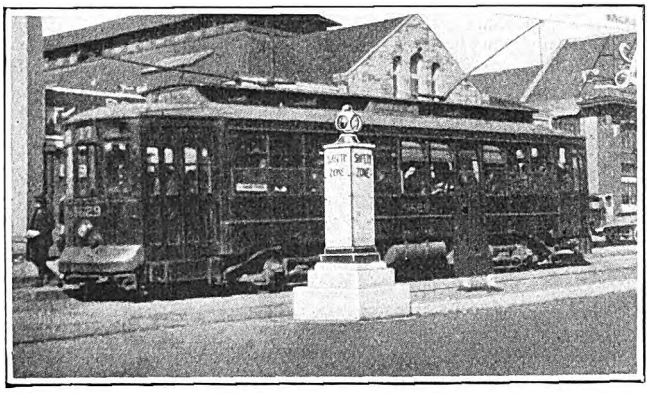
disturbed materially. The purchases for renewals during the past five years have been decidedly subnormal, and the returns to more normal upkeep for ultimate economy and efficiency under the improved conditions of the railways can be looked forward to.

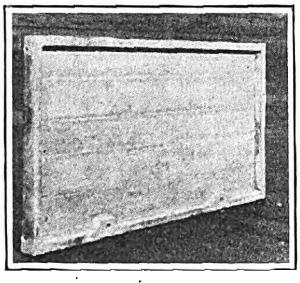
What may be considered normal average annual renewal of special trackwork at present-day values, figured from the probable total amount in service and the average life thereof, is given in the accompanying table. Adding thereto a moderate amount of new work and discounting the work done by the railways themselves gives a figure of $10,500,000 as the potential amount of the normal annual business in special trackwork material. This is for surface railways only and does not include elevated railways and subways, the business from which is slowly increasing as new rapid transit lines are added in the larger cities.

Trolley Loading Platforms in Baltimore Marked with Blinkers

INTERMITTENT warning lights of the type which are widely used to mark dangerous street intersections are being tried in Baltimore to mark the ends of trolley loading platforms. In this case the loading platforms are built and installed by the United Railways & Electric Company, while the warning lights are put up by the city. An interesting feature is the sectional construction of the platforms. Concrete slabs about 8 ft. long and 4 ft. wide are used for this purpose. They are hollow on the under side, as shown in one of the accompanying illustrations. The sections are made in the company's yard and are carried on flat cars to any desired location. This design makes it possible easily to install and remove the platforms or to increase and decrease their length. The blinker lights are made by the American Gas Accumulator Company.



Above, Intermittent Warning Lights Are Used at Safety Isles in Baltimore

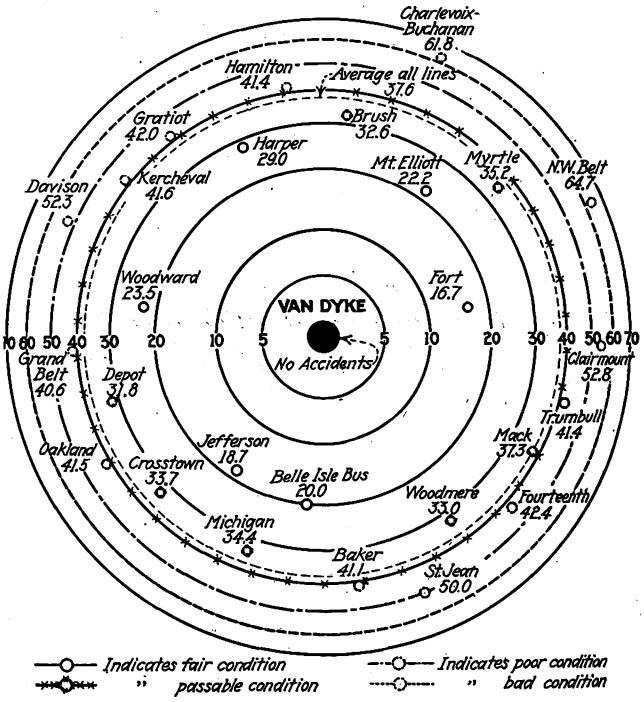


At Left, Hollow Concrete Slabs of This Type Are Used in Building Loading Platforms

Previous to their installation several unlighted types of sign were used to mark safety isles, but proved unsatisfactory on account of their being difficult to see at night.

Accident Prevention Target in Detroit

TO CREATE interest in the reduction of accidents and to present the results accomplished in interesting form, the target chart shown in the accompanying illustration was designed by the Department of Street Railways of Detroit at the suggestion of H. M. Gould, assistant general manager. This chart is called a "No Accident Bull's Eye" and is made up in the form of blueprints approximately 4 ft. square. These prints are displayed at the various carhouses and show in a forceful and interesting way the comparative accident record of each car line on the system. The figures represent the number of accidents per 100,000 car-miles. The center of the bull's eye represents no accidents.



Something to Shoot At

"No Accident Bull's Eye" used by the Department of Street Railways of Detroit for increasing interest in accident prevention measures. Each "bullet hole" indicates the record of an individual car line and the figures show the number of accidents per 100,000 car-miles.

On the targets displayed in the carhouses, colors are used to make them more attractive and also to tie them up more closely with street railway operation. Standard railway signal colors are used for this purpose. The "60" circle is colored red, as are also the "bullet holes" outside the "50" circle. This is intended to indicate danger to the lines whose scores carry them that far out from the center. The "50" circle is colored yellow, together with the "bullet holes" outside the "40" circle. The "40" circle and "bullet holes" outside the "30" circle are colored green. The "30" circle and everything inside of this point are white to indicate clear track and safety.

Each month the targets are displayed in conspicuous places in the carhouses. In calling attention to the results accomplished, and in urging the men to renewed interest in accident reduction, the company said:

"If every trainman will aim at the dead center and hit it, every line will make a bull's eye. Impossible? Perhaps, for some, but don't let it be you. Clean up the old blunderbus, adjust the sights, keep your head level, your arm steady, your eye clear, draw a bead on the center—and Shoot!"

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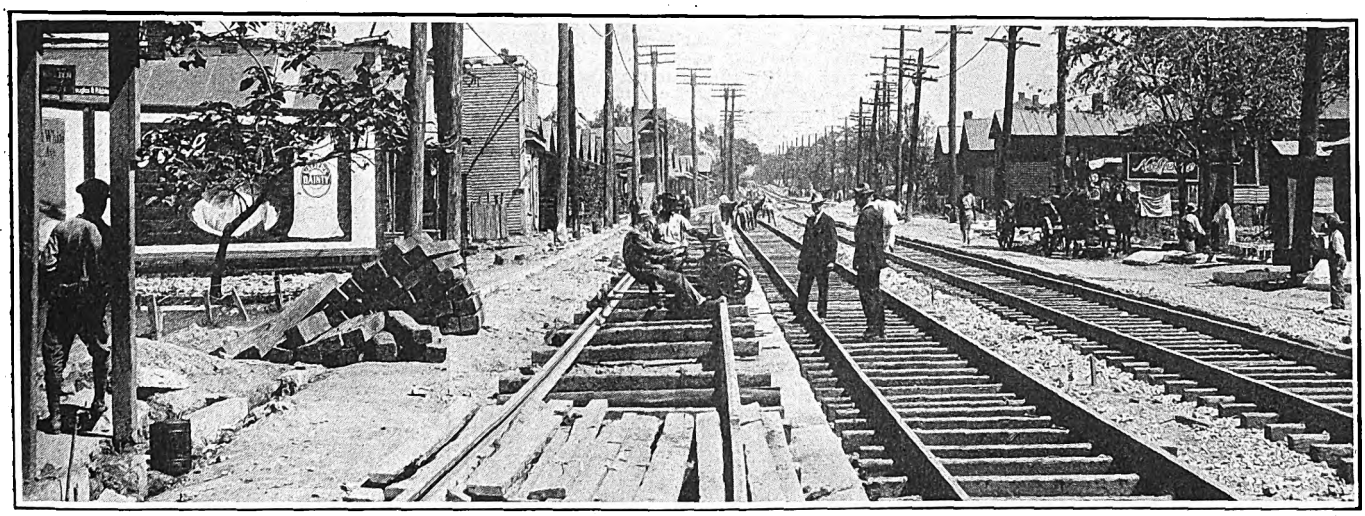
Track Reconstruction Cost Reduced by Use of Modern Equipment

Rail Pre-Welded in Lengths Up to 3,180 Ft. Was Installed by Birmingham Electric Company Without Interruption to Service—Joints Were Thermit Welded Under Pressure Produced by Special Clamps—Concrete Mixed at a Central Plant Was Transported and Poured from an End-Dumping Rail Car

By A. Taurman
Superintendent Equipment, Way and Structures Birmingham Electric Company
Birmingham, Ala.

DURING the year 1924 the Birmingham Electric Company was faced with the task of rebuilding the equivalent of approximately 10 miles of single track. This was on a street which is part of the state highway system and where the cars are operated on a six-minute headway during the non-rush hours, with three-minute service during the rush. To make the matter more difficult there was no parallel line to serve this territory nor any parallel paved street to which the vehicular traffic could be diverted.



On a Recent Track Job in Birmingham Long Sections of Rail Were Thermit Welded Before Being Installed. Joints Were Finished by a Rotary Grinder

It was, therefore, necessary to rebuild the track under traffic and with the least possible delay to car service.

To accomplish this the company decided to pre-weld the new rail alongside the existing track and then move it into position in long lengths. Feeling that the construction forces of an electric railway can compete successfully with local contractors in the matter of cost only when they have an adequate equipment of modern machinery, the company provided up-to-date cranes, work cars, welding and grinding apparatus, and a special end-dumping car to transport mixed concrete. By having a good organization and modern track machinery it was possible to do this reconstruction work at a cost substantially lower than on similar jobs in the past.

Slag ballast, wood ties, T-rail and brick paving were used. Eight inches of slag ballast was placed on the old track foundation. Creosoted ties with tie plates were used. The rail was Tennessee Coal & Iron R.E. 101.69 6-in. tee section. A 6-in. concrete slab with a 1-in. cushion of sand serves as a foundation for the paving. Three-inch bricks were used grouted with concrete to within ½ in. of the top of the brick, so a hot asphalt binder was then poured over the top and the surface covered with sand. It was agreed between the railway and the city to allow the ends of the bricks to go under the head of the rail inside the track and to come flush with the outer rail head and in the dummy strip.

After deciding on the type of track structure most desirable for this location, the next question was that of selecting and assembling equipment suitable for the rapid construction of the line. A Universal crane mounted on a 7½-ton Mack chassis was equipped with a clamshell bucket and used for excavating. The old track was stripped of its chert ballast, which was thrown to one side and hauled away either by Differential dump car or by motor truck, depending on the quantity to be hauled at any particular time. An end-dump car of special design was used to haul concrete from the mixing plant and deposit it between the rails.

Usually in the construction of track under traffic the electric seam-welded joint has advantages over other types. Before undertaking this job a series of tests was made by the company on seam-welded joints and thermit-welded joints. From this it appeared that the thermit-welded joints could be successfully used under these conditions by welding long lengths of rail before placing it in the track. A question arose, however, as to the best method of securing compression on the joints while they were being welded. This was accomplished by placing clamps on each end of the abutting rails and connecting them by 1-in. steel rods. An accompanying illustration shows the arrangement of

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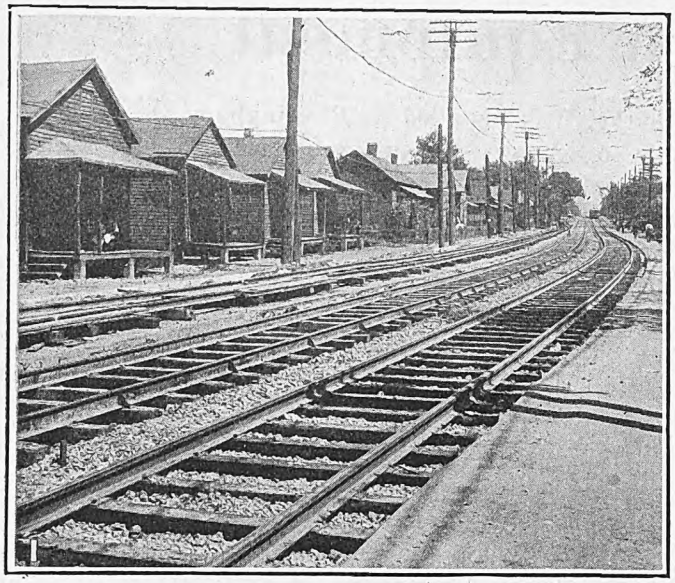
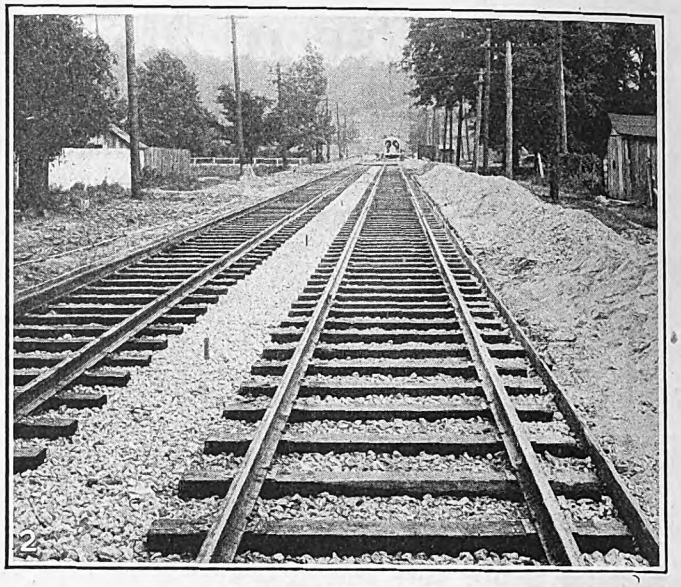
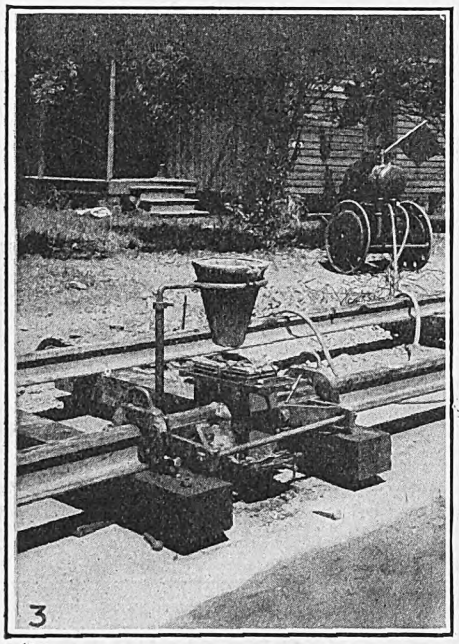
Pre-Welding Rail Joints by the Thermit Process to Permit Track Reconstruction Without Interruption to Car Service







No. 1. Right-hand track lined and surfaced while the second has been stripped ready for removal as soon as spikes are pulled. New rail shown at the left.

No. 2. Both tracks welded, surfaced and ready for concrete.

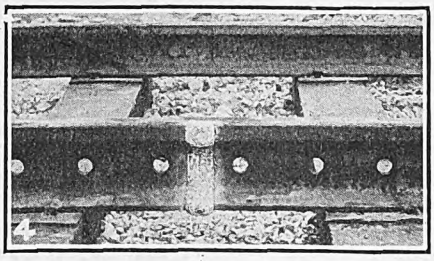
No. 3. Clamp, crucible and mold in place for making thermit weld.

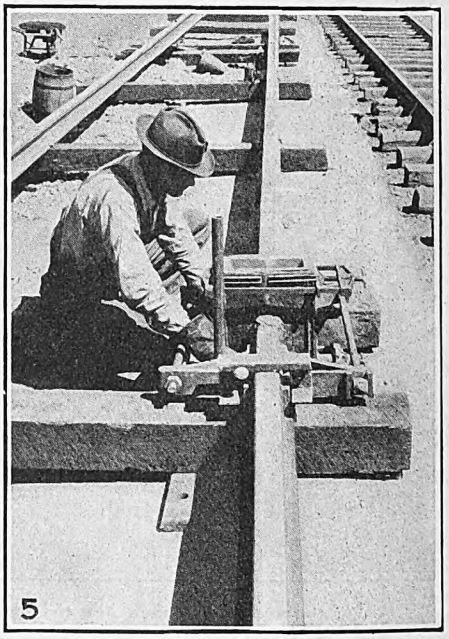
No. 4. View of finished thermit welded joint after head of rail had been ground smooth.

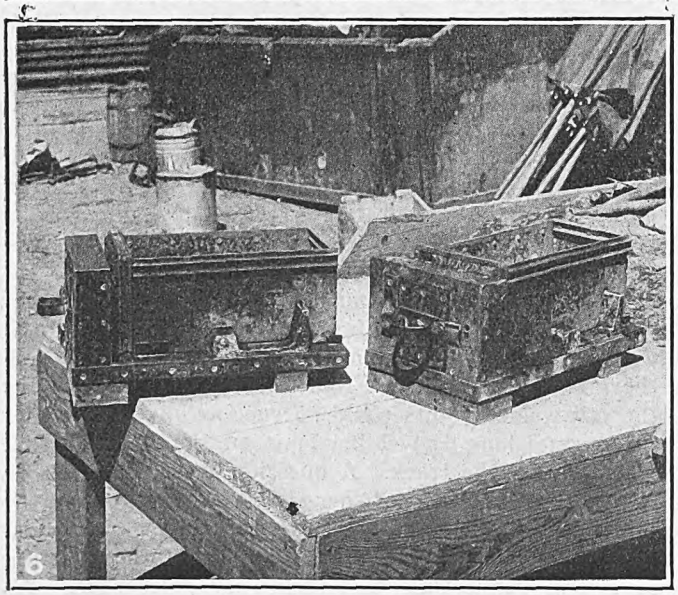
No. 5. Special clamp designed to provide compression while the weld was being made.

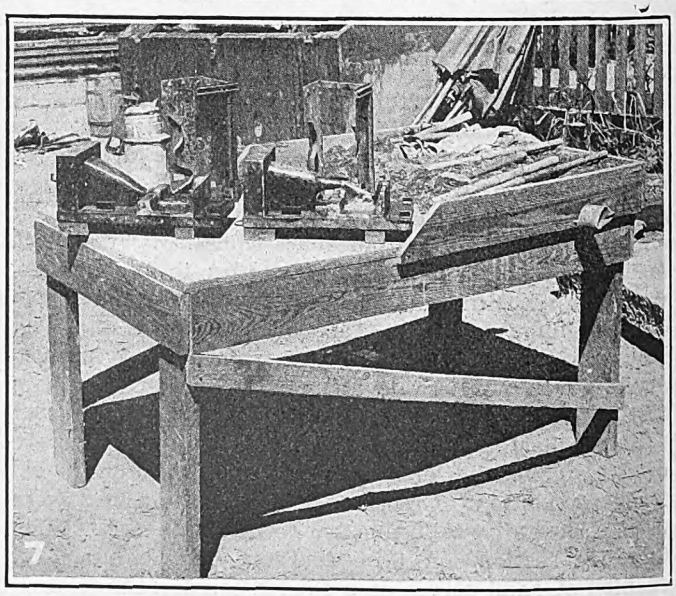
No. 6. Appearance of the completed mold boxes attached to the pattern.

No. 7. Pattern used for making mold boxes for 6-in. T-rail.









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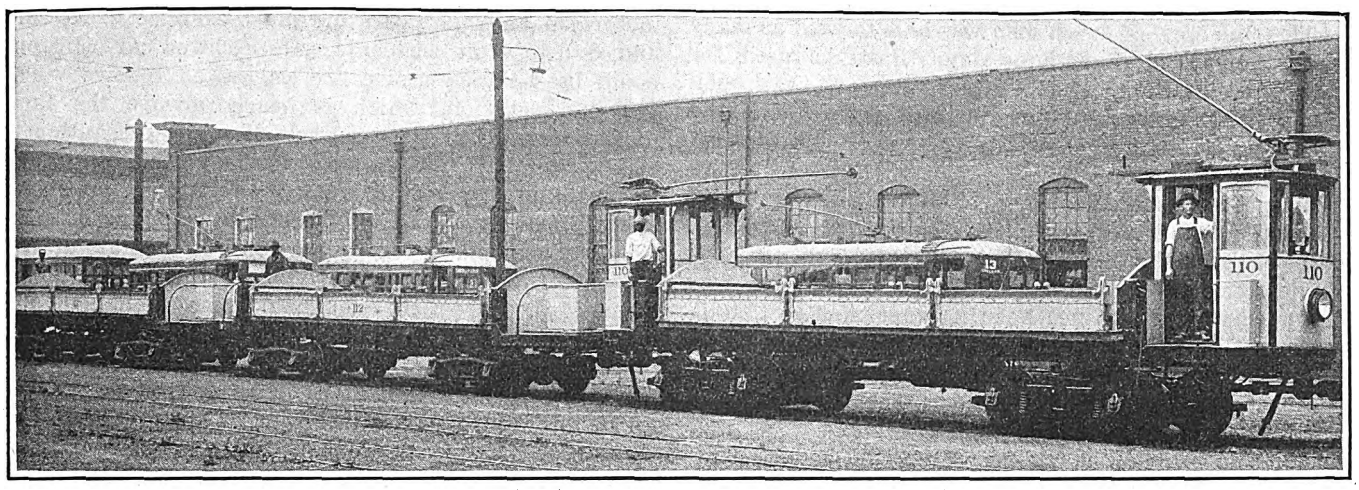


Three-Car Differential Dump Trains Used in Birmingham to Haul Material for Track Jobs

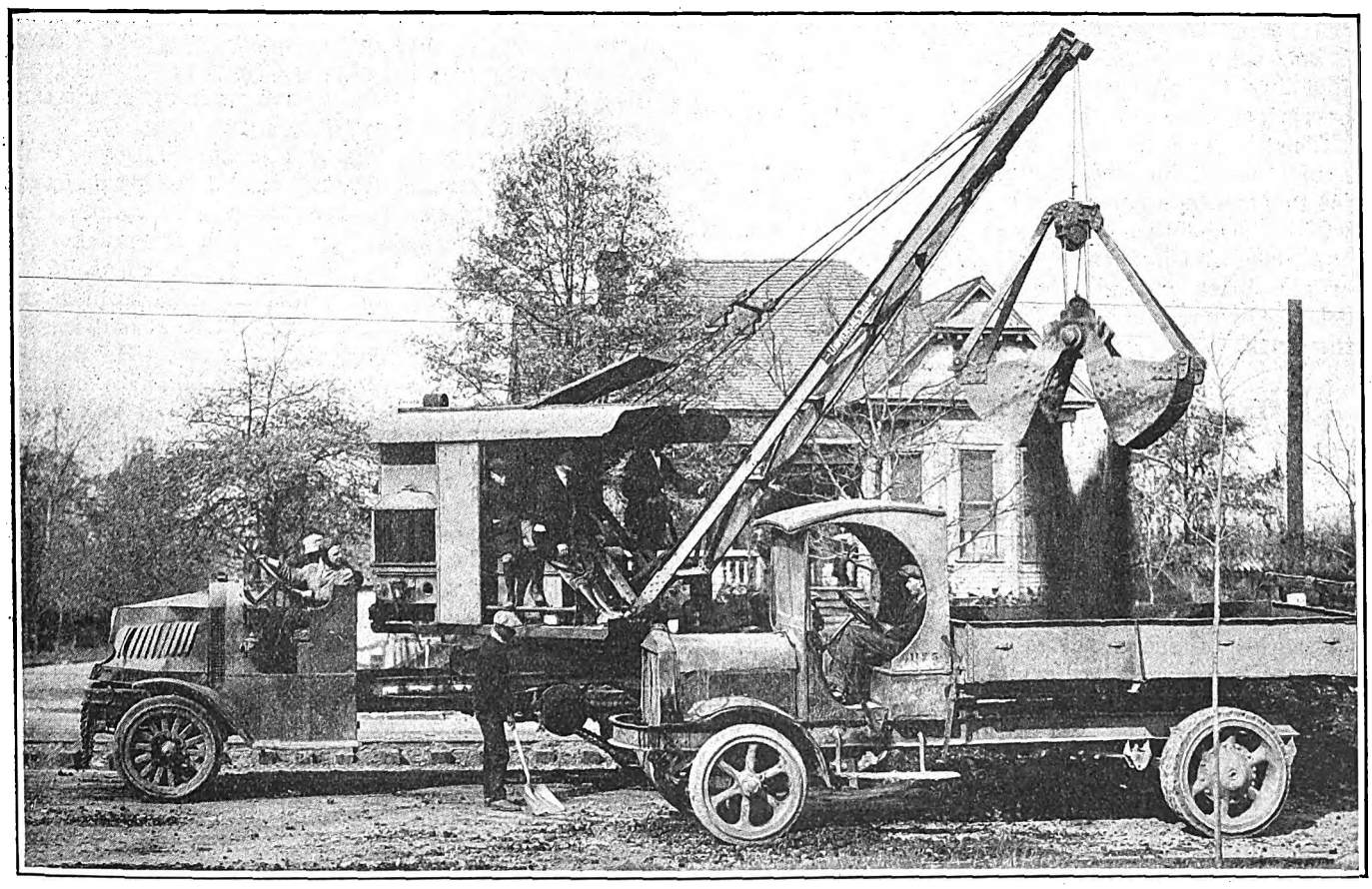
these clamps. They not only pull the rail into proper line and surface, but hold the insert in place while the mold is being put in position. They also make it possible to secure sufficient compression to upset the ends of the rails while the weld is being made.

After this, the new rail was laid parallel to the existing track and spiked down to the correct gage, on old ties, which were placed on the pavement near by. One of the illustrations shows this step in the procedure. This was done in order to permit the use of a Universal track grinder to finish the newly welded joints.

Rail was welded into lengths, at first of 950 ft., and later increased to as much as 3,180 ft. in a single section. After rails were properly welded and ground they were slid over by using crowbars into the track area and laid closely alongside the existing rails. At every fifth or sixth tie they were spiked down. This was all accomplished without interruption to car service. The old rail was then cut into pieces and moved to one side. New rail was then slipped in and connected up. Existing ties and plates were used to support the new rail, except where inspection showed a need for renewal. Afterward the old rail was removed and the cars operated over the new while it was being surfaced and lined up.

An interesting feature of this construction work was the rapidity with which rail could be transferred from the side of the street into place in the track area. In one instance 1,600 ft. of rail was moved over into position in five minutes. Cars were operated over the new rail as soon as it went into the track and there was practically no interruption to service.

Careful organization of a welding crew reduced materially the length of time required to make a thermit



Universal Crane Mounted on a 7½-Ton Mack Chassis Removing Old Ballast

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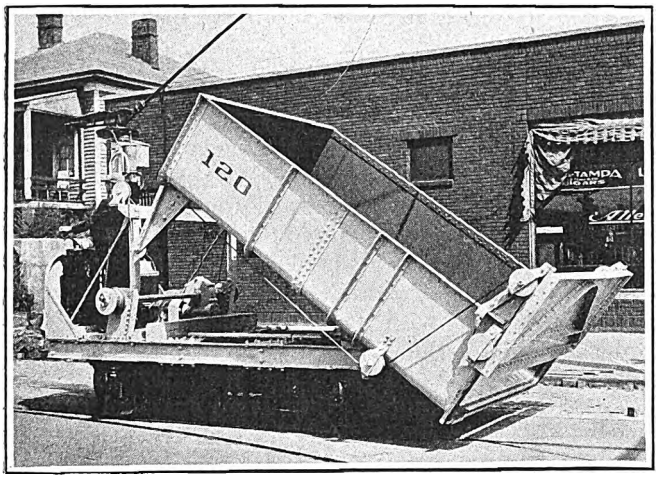
weld. One crew of seven men was able to weld as many as 60 joints in an 8½-hour day. Patterns used for making molds, the mold boxes themselves and the special clamp used for compressing the rail ends during the welding process are shown in accompanying illustrations.

To prevent vehicular congestion on this street an unusual method of placing the concrete was adopted, using a specially designed single-truck rail car. A single section of an ordinary Differential dump car was arranged with a modified hoisting apparatus so that it could be dumped endwise instead of sidewise. The railway arranged with a local construction company to purchase concrete already mixed at the latter's plant. For this purpose a special central mixing plant was installed to provide 300 cu.yd. of concrete a day. The



A Specially Designed End-Dumping Rail Car Was Used to Place the Concrete Without Interruption to Car Service

price was $4.90 a cubic yard. From the mixing plant it was carried by the end-dumping rail car and deposited directly between the rails. The car is shown in operation in one of the illustrations.

The use of labor-saving machinery and careful organization of the work enabled the railway to finish the job two months sooner than the original estimate, which was eight months. Work was commenced on Sept. 2, 1924, and finished on Feb. 1, 1925, except for some of the brick paving, the completion of which was delayed by the inability of the manufacturer to supply the brick.

Boston Completes Accident Prevention Campaign

Boston Elevated Concludes Its Series of Helpful Talks on Safety—Precautions to Prevent Various Types of Accidents Are Given

THE Boston Elevated Railway has just completed a series of successful talks to trainmen on safety topics. These talks, as explained in page 185 of the issue of this paper for Jan. 31, are issued as if given as speeches at mass meetings of the employees and are sent by mail to each employee. Louis H. Butterworth, claims attorney of the company, was the speaker at the "meeting" on Jan. 28.

Mr. Butterworth took the position that the present generation is no more careless than preceding ones, only that it is more in a hurry and is able to rush about with greater speed than its predecessors. This means that motormen and bus operators must exercise great care and skill to avoid accidents. He declared car collisions could be grouped under six classes as follows: The rear-end collision, which is nearly always the fault of the operator of the rear vehicle. The precaution to follow is not to run too close to the vehicle ahead and to have the car well under control in case the driver ahead should stop suddenly. The second type of collision, the head-on, is usually the fault of the auto driver, but motormen can frequently clear themselves of all blame if they are alert enough to sense the danger and bring their cars to a dead stop before the actual collision takes place. The third is the sidewipe, often occurring when a motorman tries to pass a vehicle which has a load projecting over its side. The leg of a chair or other part of the load may just catch the side of the car and break one or more windows and shower the passengers with glass. Such collisions often occur on icy streets where there seems to be sufficient space for the car to pass the loaded truck, but this space will be found to narrow suddenly to nothing by the truck sliding or slipping off a ridge of snow or ice. Brainwork is the only precaution. The fourth type of collision is the rear-end swing on curves. The conductor should look out for this kind of accident, particularly when the car has made a stop and an auto or team drives alongside it on a curve. He should warn the motorman of such condition. The fifth type is collisions of apparatus of the fire and police departments, which have right-of-way. For this there is no defence. The sixth is "cutting in" collisions, the most frequent kind of vehicle collisions. Motormen may be rarely at fault for collisions of this kind, but as the trolley car is the rear vehicle, juries often say that the company must pay for the damage. The cross-street collision is the seventh and last type to be considered. While not more frequent than the cut-in collision, there is greater likelihood of injury because the blow is given at right angles. Special care is required at cross-streets where the view is obstructed, and warning of the car's approach should be given through the gong.

At the meeting on Feb. 4 Michael F. Doyle, chief investigator of claims, declared it to be very important, while getting the names of witnesses in an automobile accident, to obtain as well the registration numbers of other automobiles at the scene of the accident, if the drivers or other occupants would be likely to have any knowledge of the accident. Mr. Doyle also discussed boarding, alighting and "falling" cases. He pointed out how alertness on the part of the guards or conductors in watching passengers board and leave, and the care of motormen in starting the car without jerks, could reduce these classes of accidents. Other "don'ts" related to giving the starting signal too quickly when an old or maimed person is about to leave or board the car, allowing the passenger to leave bundles where some one might trip over them, of neglecting to see that the floor is in good condition, especially in winter, etc.

On Feb. 18 David S. Lee dwelt on how accidents are paid for, and Miss Mary L. Donnelly, head stenographer of the department, on Feb. 25 mentioned some amusing claims, as that of the passenger for his hat because it was blown off while he was riding in an open car. On March 4 R. L. Mappleback, trial attorney, gave several striking examples of the way in which slight troubles on the car developed into serious accidents when described in court. The best remedy, he said, is to avoid accidents.

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Holyoke Contracts for Power

Some of the Considerations Which Influenced the Holyoke Street Railway Company to Purchase Its Electrical Energy Instead of Continuing to Generate It in Its Own Plant—Railway's Generating Plant Is Purchased by the Power Company

By George E. Pellissier
Assistant General Manager Holyoke Street Railway

AFTER operating its own power plant for the past 30 years, the Holyoke Street Railway recently decided to discontinue the generation of electricity and has entered into a contract with the Turners Falls Power & Electric Company of Greenfield, Mass., for the supply of all the electrical energy which will be required in the conduct of its business for the next twenty years.

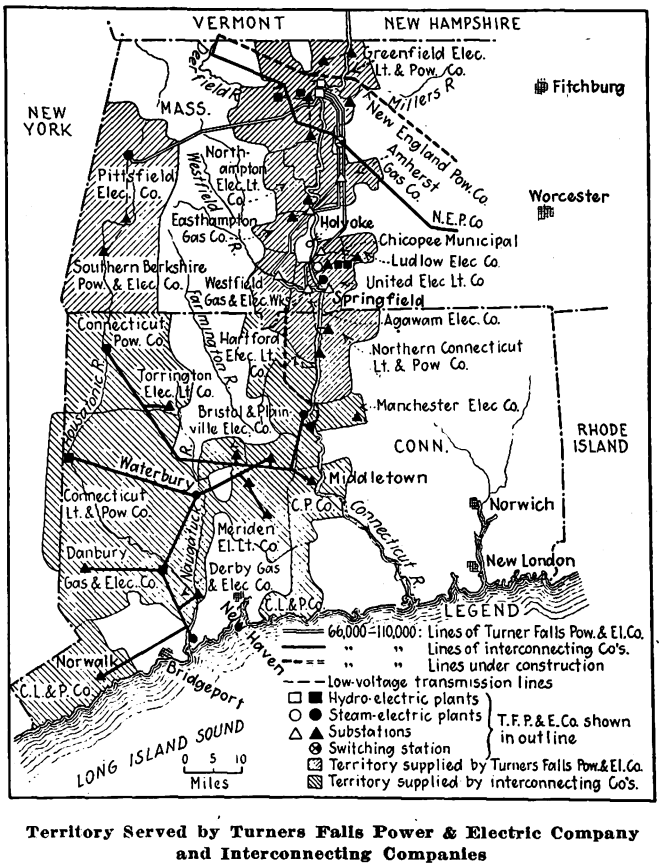
While the results obtained from the isolated power plant which is now to be abandoned have been eminently satisfactory, both as to cost and reliability, changes in conditions since the plant was built made the directors weigh very carefully the advantages and disadvantages of purchasing power before making the additional investment which would soon be necessary if the company was to continue generating its own power.

When the road was electrically equipped in 1891, and until the year 1895, all the electrical energy required for the operation of the Holyoke Street Railway was purchased from the Holyoke Water Power Company. In the latter year the railway company decided to build its own power plant, partly because the voltage regulation of the hydro-electric machines of the Water Bureau Company, in use at that time, was not very satisfactory, partly because the cost of purchased power was high, but also largely because the electric railway system was expanding so rapidly that the purchase of sufficient power for its requirements appeared difficult.

Its first power installation consisted of three 300-kw. direct-current generators direct connected to steam engines. This installation proved to be very satisfactory, and as the maximum distance the energy had to be transmitted at that time was less than 5 miles the losses in distribution were not excessive.

In the next decade the extension of the Holyoke railway system necessitated the enlargement of the plant to furnish the additional energy required. During this period the company acquired several small connecting railway properties, one of which had a small steam station at North Amherst. This station was kept in operation as it was some 20 miles from the main power station at Holyoke, and it was obviously out of the question to transmit the necessary energy at direct current. These extensions and consolidations shifted the center of gravity of the power load several miles from the main power station, involving serious energy losses in transmission, in addition to the inefficiency of operating the small steam station located at North Amherst.

In consequence, in 1915, contracts for energy were made with the Turners Falls Power & Electric Company, which had recently completed its hydro-electric plant on the Connecticut River at Turners Falls and had erected substations at Amherst, Mount Tom Junction and Alderville, all of them in close proximity to



Territory Served by Turners Falls Power & Electric Company and Interconnecting Companies

the distribution lines of the street railway company. The amount of energy contracted for was all which could be economically supplied from these stations and amounted approximately to 2,000,000 kw.-hr. a year, or one-fourth of the Holyoke Street Railway Company's total requirements. This permitted the railway to shut down its small Amherst station. As the power company had no substation or transmission lines in Holyoke and as the cost of generating power in the street railway plant, which had recently been overhauled, compared very favorably with the price of purchased power, there was no incentive at that time for the company to abandon its main plant, which was then in good operating condition.

Reasons for Purchased Power Today

In the ten years which have elapsed since 1915, several important changes in conditions have had a decisive influence in the company's decision to purchase electrical energy instead of continuing to generate it in its own station.

First in importance was the difficulty in financing the extensions and modernizing of the existing plant, which would have involved an expenditure of approximately $750,000. Under the laws of Massachusetts,

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electric railways are not allowed to issue stock at less than par and can issue bonds only up to the amount of capital actually paid in. For the past few years, on account of the financial difficulties experienced by many electric railways due to rising costs, bus competition, etc., electric railway stock, even of roads which have been able to maintain the payment of dividends, has not been considered a particularly attractive investment, so that, at present, few if any of the electric railways in Massachusetts can issue stock at par. In the case of the Holyoke Street Railway, although in excellent physical condition and with a continuous dividend record extending over a period of 30 years with the single exception of 1917, when the company passed its dividend rather than curtail the maintenance of the property, the stock could not be issued at par at the present time. As under the law it would be possible to issue only $200,000 additional in bonds, the question of financing the necessary power-house improvements was a very important factor in the decision.

A second factor was the attractive rate offered for electrical energy by the power company. This rate was possible because the power company could supply a great portion of the energy from existing transmission lines and substations and had arranged to use the existing steam generating station of the Holyoke Street Railway as a substation from which to supply the remainder of the electrical energy required for the operation of the railway system. This means that practically no change will be required in the distribution system other than that necessary in connection with the transfer of the conversion now in the carhouse at Amherst to the substation of the Turners Falls company, which is about a mile nearer the center of gravity of the load. This change will eliminate the expense of substation operators at the carhouse.

Three Clauses of Holyoke Street Railway Contract for Purchase of Energy

ARTICLE 9. RATES

(a) Base Rate per Kilowatt-Hour. For all electrical energy delivered by the power company to the railway in each month and measured as set forth in Article 8 hereof the railway shall pay the base rate of one and eight-tenths cents ($0.018) per kilowatt-hour.

(b) Change in Base Rate Due to Cost of Coal. If on the first day of any month the market price of coal as hereinafter defined is greater than eight ($8) dollars per gross ton (2,240 lb.) then the railway shall pay an additional rate per kilowatt-hour for all kilowatt-hours paid for during such month. Said additional rate shall be the amount of seventy-five ten-thousandths of a mill ($0.0000075) for each 1 cent ($0.01) by which the average cost of coal per gross ton as hereinbefore stated exceeds eight ($8) dollars.

If on the first day of any month said market price of coal is less than seven ($7) dollars per gross ton (2,240 lb.), then the rate per kilowatt-hour to be paid by the railway for all kilowatt-hours paid for during such month shall be reduced as herein provided. Said reduction shall be the amount of seventy-five ten-thousandths of a mill ($0.0000075) per kilowatt-hour for each 1 cent ($0.01) by which the average cost of coal per gross ton as hereinbefore stated is less than seven ($7) dollars.

The market price of coal whenever referred to in this article shall mean the market price f.o.b. cars at Chicopee Junction, Mass., of bituminous coal having from fourteen thousand (14,000) to fourteen thousand five hundred (14,500) British thermal units per pound.

(c) Minimum Charge. In consideration of the investment made by the power company to serve the railway and the maintenance by the power company of its plant and equipment in condition at all times to supply the electrical energy herein contracted for, the railway agrees that if in any period of twelve (12) months during the continuance of the contract beginning on the first day of any January and ending on the thirty-first day of the following December the railway shall actually take under this contract less than six million five hundred thousand (6,500,000) kilowatt-hours of electrical energy, it will pay to the power company at the end of said period of twelve (12) months at the base rate set forth in paragraph (a) of this article for the number of kilowatt-hours equal to the difference between six million five hundred thousand (6,500,000) and the number of kilowatt-hours actually taken as aforesaid. This minimum amount of electrical energy to be paid for hereunder as above provided shall be increased from time to time in direct proportion to each and every increase in the total amount of electrical energy which the power company is required to keep available for the use of the railway as provided in Article 4 hereof.

ARTICLE 15. ARBITRATION

In the event of a difference of opinion as to the interpretation of the several articles of the contract, or as to the fulfilling of its conditions by the respective parties, the parties hereto do mutually agree that the questions be submitted to a board of arbitration consisting of one member, if the parties are able to agree upon such person, otherwise consisting of three (3) members, one appointed by the power company, one by the railway, and the third chosen by the chairman of the Department of Public Utilities or the chairman of the board which shall then have the public duties now performed by said department, and in case such chairman fails to make such appointment within sixty (60) days of the request to him so to do, the third arbitrator shall be chosen by the other two, to hear the parties and to decide such questions. The decision of said arbitrator or any two of the three arbitrators shall be final and binding. In the event of either party failing to appoint an arbitrator within ten (10) days after written request from the other party, such arbitrator, as well as the third arbitrator shall be appointed by the chairman of the Department of Public Utilities or the chairman of the board which shall then have the public duties now performed by said department. The expense of the board of arbitration shall be shared equally by the parties hereto.

In case any difference of opinion shall arise as to the construction or performance of any of the covenants or agreements herein contained, such difference shall cause no interruption in the transaction of the business contemplated by this contract, and all such business shall continue to be transacted, and all payments hereunder to be made in the same manner in which the same have been transacted and made prior to the arising of such difference until the matters in difference shall have been fully determined by agreement or by arbitration as herein provided.

ARTICLE 16. REVISION OF RATES

At any time during the first three (3) months of the year 1936, and of the year 1941, either party hereto may apply to the Department of Public Utilities for a revision or alteration of any or all of the provisions of Article 9 of this contract relating to payments to be made by the railway for or in connection with the electrical energy delivered or kept available under this contract, including the minimum amount of electrical energy to be paid for, and thereupon said department shall have full power to revise and alter any or all of the aforesaid provisions in such manner as said department shall determine to be just and equitable, with due regard to the interests of both parties, and the revisions and alterations so made shall be final and binding upon both parties and shall become effective at such time not earlier than the date of the application therefor as said department may determine.

Whenever the Department of Public Utilities is herein referred to, such reference shall be taken to mean either said department or such other department, board or commission as shall have at the time of any application made hereunder the general powers and duties which are now vested in and imposed upon said Department of Public Utilities.

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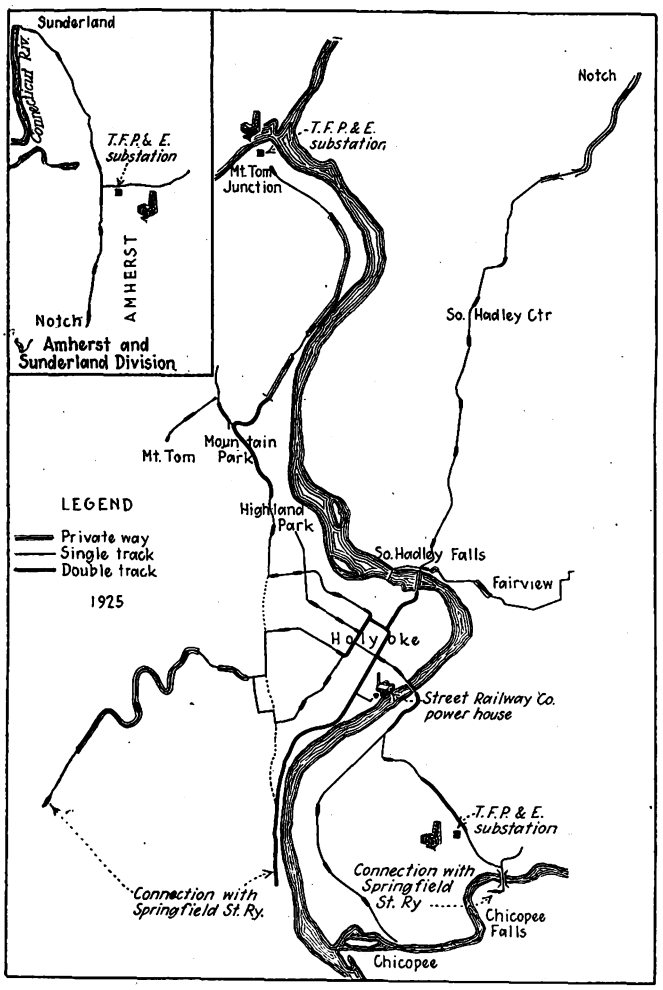

Holyoke Street Railway Lines, Showing Locations of Substations

A third factor influencing the decision in favor of purchased power was the agreement of the power company to purchase the existing power plant for $400,000, which is the book value less accrued depreciation (for which a reserve had been already set up). This amount will be available to the railway company for taking up outstanding mortgage bonds or for financing other improvements.

The fourth important consideration was the fact that the power company, because of its interconnection with other large power developments as shown by the accompanying diagram, offers a far greater protection against interruption of service than could possibly be obtained from any isolated direct-current steam-generating station.

COMPARISON OF COST OF ENERGY PURCHASED AND COST OF POWER GENERATED BY HOLYOKE STREET RAILWAY AT BERKSHIRE STREET POWER STATION

(Based upon the generation of 6,800,000 kw.-hr. direct current a year and coal at $8 per gross ton)

Generation of power at Berkshire Street station:

		Amount per Annum	Cents per Kw.-Hr.
Superintendence		$2,500.00	0.037
Buildings, fixtures and grounds		534.28	0.008
Equipment		5,108.17	0.075
Labor		30,305.51	0.446
Fuel (8,803.1 gross ton at $8 per gross ton)		70,424.80	1.036
Water		110.64	0.002
Lubricants		2,643.47	0.039
Miscellaneous supplies and expenses		1,399.19	0.020
Insurance—Fire	$980.00		
Use and occupancy—earnings	388.33		
Use and occupancy—boiler	357.14		
Steam boiler	140.60		
Flywheel	623.37		
Workmen's compensation	318.02	2,807.46	0.041
Interest on land, building and equipment		24,558.58	0.361
Interest on investment in coal supply		1,800.00	0.025
Depreciation		19,287.45	0.284
Taxes		11,585.92	0.171
Total cost to develop 6,800,000 kw.-hr. direct current		$173,065.47	2.545
Under proposed contract of Turners Falls Power Company: 6,800,000 kw.-hr. direct current at 1.80 cents		$122,400.00	1.800
Difference in favor of purchased power		$50,665.47	0.745

TERMS OF POWER CONTRACT AND COST DATA

The power contract itself does not differ materially from that usual except as to rates and possibly the provision for revision of rates at the end of the ten and fifteen-year periods, and the provision for arbitration of disputed questions through the Department of Public Utilities. These clauses are shown on page 542.

The accompanying table gives the cost of purchased energy as compared with that generated in the existing steam-generating station, based upon actual operating figures for 1923 with coal at $8 per gross ton. It shows the saving effected by purchasing energy will be approximately $50,000 per annum.

Automatic Barriers Protect Highway Crossing

Safety Gates of Steel Cable Installed at Highway Crossing on North Shore Line Are Designed to Yield but to Withstand Impact of Moving Automobile—Preliminary Signal of Approaching Train Given by Whiplash

AUTOMATICALLY CONTROLLED highway barriers of the yielding type have been installed by the Chicago, North Shore & Milwaukee Railroad on either side of the Middle Road crossing, Racine, Wis. These barriers are designed to stop an automobile should the driver fail to heed the warning signals. Each barrier contains a gate of steel cable which may be lowered across the highway. An automobile striking the gate is gradually retarded and brought to a stop before the tracks are reached. The barriers and retarding mechanism are strong enough to stop an automobile traveling 60 m.p.h. The gates are similar to those installed at the Austin Avenue crossing on the Chicago Elevated Railways, and described in this paper for Nov. 31, 1921, page 1145. A preliminary warning of the approaching train is given to the driver by a whiplash placed adjacent to the highway 150 ft. in front of each barrier. The movement of the gate is interlocked with color light signals on the railways.

Mounted across the highway 50 ft. from the nearest track rail is the barrier supporting frame, which consists of fabricated steel columns carrying a truss that spans the road. Upon the bridge is mounted the electric motor and propelling mechanism for raising and lowering the steel cable gate, which consists of three ⅜-in. steel cables suspended approximately 1 ft. apart, and reinforced by means of lighter vertical steel cables fastened between them. Square pieces of heavy canvas, striped black and white, form a checkerboard design calling attention to the barrier. The ends of the gate travel in guides in the columns, and are so arranged that it can be deflected to a total distance of 30 ft. when lowered. The yielding action is governed by weights and adjustable friction brakes, the retarding force increasing the farther the gate is deflected, so that it is possible to bring a moving automobile to a stop without the destructive result caused by a collision with an immovable gate.

On the right-hand side of the road, 150 ft. ahead of

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the barrier, is the balanced whiplash or arm, which is 12 ft. long and is mounted on a column approximately 15 ft. high. From the arm are suspended bamboo-covered tell-tales of small cable, which will be struck by a moving automobile when the whiplash is extended across the road. In addition an illuminated sign reading "train coming" is carried above the arm, and the barriers themselves carry gongs and illuminated red stop signs.

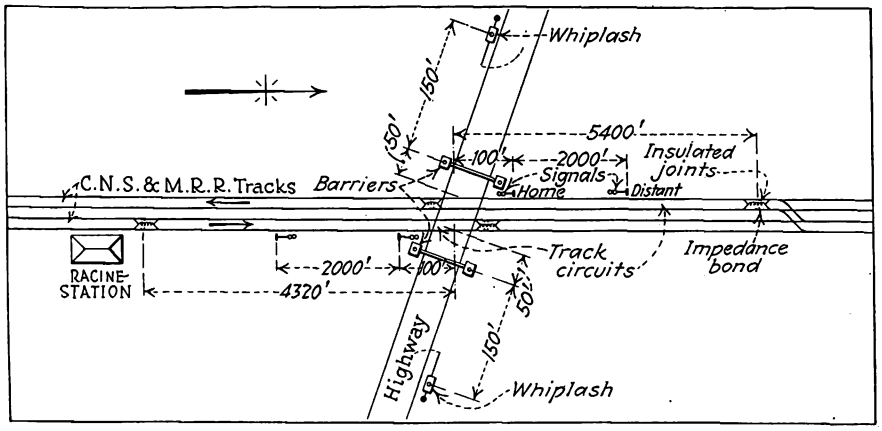
Two-position colored light signals mounted along the railroad right-of-way indicate the conditions at the crossing to the motorman. Two are located on the right side of each track. The home signals, located 100 ft. from the crossing, show green for "proceed" and red for "stop." The distant signals, 2,000 ft. ahead of the home signals, have green for "proceed" and yellow for "caution." The changes in these signals are controlled by the movement of the barriers.

METHOD OF AUTOMATIC CONTROL

Both tracks carry 12-volt a.c. track circuits on both rails, the current being confined to insulated joints and impedance bonds. The track circuit for northbound trains starts 4,320 ft. south of the intersection, while the southbound one starts 5,400 ft. north of the crossing. Both circuits terminate a few feet beyond the highway. A train entering the track circuit trips the track relay, which actuates the time element relay and also closes the motor control circuit, causing the motors to swing the whiplashes into position across the highway. Twenty-five seconds after the time element relay has dropped, the control circuit of the barrier is closed and the barrier starts down, the warning gong begins to ring and the red stop sign on the truss of the barrier is lighted. It requires seven seconds for the barrier to move down. During the 32 seconds between the time the train enters the track circuit and the time the barriers reach their lowest position, the railroad signals remain in their normal positions of yellow for the distant one and red for the home. When the barriers are completely lowered a circuit is closed and actuates the signal relays to change the indications to green. After a train has cleared the crossing and left the block, the operating sequence is reversed, the railroad signals go to their normal positions, the barriers are raised and the whiplashes swing out of position automatically. A three-phase, 220-volt, 60-cycle line operates the barrier and whiplash motors. Single-phase, 110-volt, 60-cycle current is used for the lighting control circuits, and is stepped down to 9-12 volts for the track circuit.

Should a train enter the block on one track just as a train on the other track is clearing the block the barriers would stay down, the whiplashes remain in position and the railroad signals would remain at proceed, retaining the right-of-way for the railroad. Should the automatic control fail, the barriers go down, and after a period of 10 minutes a bell notifies the maintainer, who lives near the crossing, that traffic at the crossing is at a standstill. In that event he may throw over a switch in the relay house that connects the control circuit with a push-button control located outside, so that the apparatus may be operated manually in a similar manner as by the automatic control. Notification is given the dispatcher at Milwaukee and a repair man is sent out. Should either barrier fail to operate, even with the manual control, it can be moved with an endless chain located in one of the columns.

The locations of the various parts of the apparatus and the time delay feature of the control have been carefully worked out to make the crossing safe. An automobile traveling 40 m.p.h. may be stopped with its own brakes in the 150 ft. between the whiplash and the barrier. The 32-second period is sufficient to allow an automobile traveling but 6 m.p.h. to pass the whiplash as it swings into position and clear the barrier on the far side of the railroad right-of-way before it is lowered. A train traveling 60 m.p.h. will cross the highway 33 seconds after the barriers have been lowered. At this speed an allowance of four seconds is given between the time the barriers are all the way down and the time the train reaches the distant signal, so this signal will clear just four seconds ahead of the train. However, as this is a caution signal and not a stop signal, the train may pass it and have 2,000 ft. in which to stop before the home signal is reached.



Schematic Layout of Crossing Showing Location of Whiplash, Barriers and Signals

This is the initial installation of this type of crossing protection on the North Shore Line. Before the barrier was placed in service, it was subjected to operating tests, including impact with a 5-ton truck. At 16 m.p.h. a coasting impact resulted in a deflection of 16 ft. At 16 m.p.h., with the clutch in, the truck was brought to a stop in 24 ft. As this was the maximum speed of the truck, it was impossible to obtain the maximum deflection of 30 ft. No damage was done to either the crossing protection apparatus or to the truck as a result of these tests.

How Railway Aids Safety Work

AS PART of its contribution to the work of the Baltimore Safety Council the United Railways & Electric Company has distributed 100,000 copies of *Trolley Topics* containing an article on "The Value of the Playground in Keeping Children Off the Streets." In addition to this, 4,500 cards bearing safety messages have been posted in the cars of the railway during the past year.

According to L. H. Palmer, vice-president and general manager, the company feels that there is a dual responsibility, and that any local effort to reduce accidents should be supported by all interests concerned, thus developing a co-partnership in accident prevention that will accomplish maximum results.

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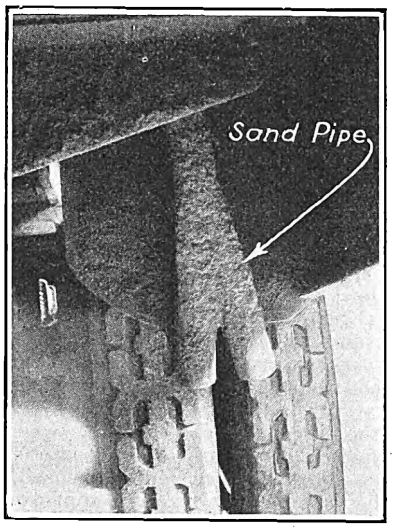
Sand Boxes on Buses

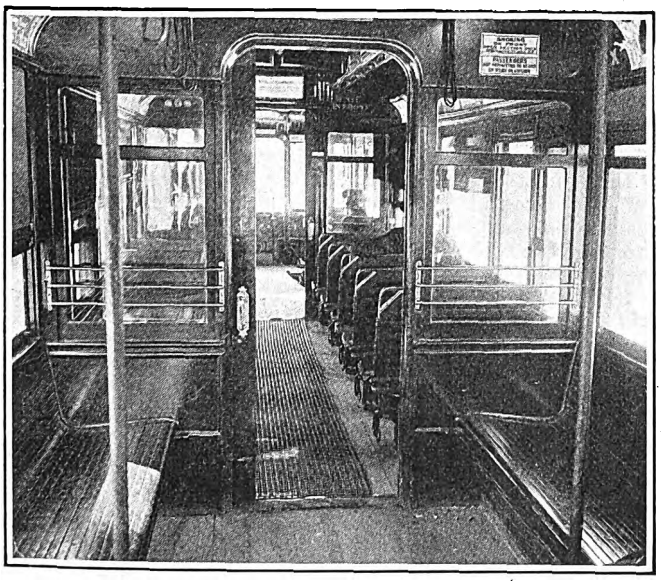
SAND boxes have been installed on the buses operated by the Des Moines City Railway, Des Moines, Iowa. The sand is controlled by a mechanical lever mounted near the emergency brake lever in a position convenient to the driver. Sand boxes are located under cross-seats on each side in positions immediately above the sand pipe outlet. A rod runs back from the driver's control lever and is connected by small bell cranks with the slide valves under the sand boxes. The arrangement is such that the valves on both sides of the bus are operated at the same time, thus discharging sand in front of both rear wheels. These wheels carry dual pneumatic tires, and each sand pipe has two outlets so as to distribute the sand under both tires.



Sand Boxes on the Buses of the Des Moines City Railway Are Arranged to Prevent Skidding on Slippery Pavements

Seat Rearrangement on Los Angeles Cars Proves Popular

A REARRANGEMENT of seats was made recently on a test car of the Los Angeles Railway and tried out on a crosstown line. The cars of this company have open ends and an inclosed center section separated by two bulkheads with sliding doors.



Longitudinal Seats in the End Sections of This Car Provide Larger Loading Platforms

Reversing the plan in use on the majority of the cars, the seats in the open ends on the test car were placed longitudinally and cross-seats were installed in the center section. The purpose of the longitudinal seats was to provide more space on the loading platforms and reduce the congestion on the back end. A postcard vote of passengers showed a five to one preference for the new arrangement.

The Readers' Forum

PITTSBURGH RAILWAYS COMPANY

PITTSBURGH, PA., March 28, 1925.

To the Editor:

I have read with unusual interest your article giving the facts regarding the St. Louis situation and heartily approve your method.

The conclusion reached by me after reading your article is that the people of St. Louis are going to pay a large penalty, either in impaired service or excessive cost of service or both, for their failure to bring about a co-ordination of street railway and bus services.

The unbiased and frank statement of all the essential facts you have made seems to me to be in line with the only worth-while method of attacking any unsound practice and especially the vicious practice of destructive competition.

T. FITZGERALD,
Vice-President.

Comment on the St. Louis Situation

MOUNT VERNON, N. Y., March 25, 1925.

To the Editor:

Your article in the March 14 issue on "Transit Conditions in St. Louis Today" is, to use a bromidic but truthful phrase, worth a whole year's subscription. It is of the essence of good journalism to tell the truth regardless of consequences—and, still better, to tell the truth from first-hand study.

The situation in St. Louis well illustrates the adage that "There is much to be said on both sides." You have fairly set forth all that can be said by both parties. When we interpret the data so clearly stated we become aware that this is far more a conflict between two transport undertakings than between two modes of transport. It is made obvious that when car and bus are run by separate concerns, clashing and overlapping are inevitable; but that when car and bus are run by one concern the public can get the advantages of de luxe bus service without losing the great benefits of necessity trolley service.

You have done wisely in refraining from comment on the information presented. Doubtless, each man will view your facts through the lens of his prejudices, yet the truthfulness of your outline will survive all distortion. At a critical moment, you have permitted the industry to see to what extent the incursion of the independent bus is due to genuine demand and how much to the vulnerable opening afforded by an electric railway bound in the thongs of receivership. May your work prove more immediately fruitful than the jitney studies which the ELECTRIC RAILWAY JOURNAL of the past decade was privileged to offer to its readers.

WALTER JACKSON.

With the advent of the first warm spring-like days, the New York Railways, New York City, commenced the operation of open cars on the Broadway line. To attract passengers these cars carried large bulkhead signs with white letters on a black background reading "Ride in the open."

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Association News & Discussions

Changes in A.S.T.M. Specifications

AS the proceedings of the American Society for Testing Materials are not available to all electric railway men a brief summary of those matters of special interest to electric railways which have come before the society during the past year is given.

Revisions have been made in a number of the specifications coming under the jurisdiction of the committee on steel. These include specifications for steel track spikes; specifications for welded and seamless steel pipe; specifications for open-hearth steel girder and high T-rails. In all of these the changes, if any, are of minor importance.

The revised specifications for structural steel for cars now adopted as standard provide an important change in the addition of a paragraph, which recognizes the use of "copper-bearing" steel, the rust-resisting properties of which have been the subject of much study during the past four years. Other revisions apply to the preparation of test specimens and to the weight of individual plates ordered to thickness.

Specifications for steel castings amended and adopted in 1924 as tentative standard relate to the heat treatment of Class A castings and Class B castings (the former not requiring heat treatment unless specified) and explain that the heat treatment may consist of annealing, or of normalizing, or of normalizing followed by annealing, or of normalizing followed by a drawback to a temperature below the critical range. No castings quenched in any liquid medium are to be offered under these specifications.

Annealing consists in allowing the castings to cool after pouring to a temperature below the critical range, then reheating them to the proper temperature to refine the grain and permitting them to cool uniformly in the furnace. In normalizing, on the other hand, the castings are allowed to cool after pouring, the same as for annealing, to a temperature below the critical range. They are then reheated to refine the grain, also the same as in annealing, but instead of allowing them to cool in the furnace, as in annealing, they are allowed to cool outside the furnace in still air. The old maximum limit of tensile strength has been omitted, it being felt that no maximum limit should be specified.

Various revisions were presented this year for the first time in specifications for carbon steel rail, low-carbon steel splice bars, quenched carbon steel track bolts, structural steel for bridges and wrought carbon steel wheels for electric railway service.

It is interesting to note that the inspection of the test steel sheets at Fort Sheridan, Pittsburgh, and Annapolis shows additional failures among the non-copper-bearing groups of sheets, with no failures in any of the copper-bearing groups. It will be remembered that the term "copper-bearing" indicates a steel, otherwise of the ordinary commercial variety, which contains about 0.20 per cent of copper.

The above sheets are exposed to air and show the superiority of copper-bearing material under atmospheric conditions. Tests, however, of sheets completely immersed, some in city of Washington water and others in Calumet mine water, do not indicate any outstanding superiority for any one type of metal, and the presence of copper added to the various types of metal does not increase its resistance to corrosion when the samples are totally and continually submerged in running water of acid or alkaline reaction. The tests further show that the average life of the sheets immersed in water from the city of Washington supply to be about 18½ times longer than those immersed in mine water.

The sheets at Fort Sheridan exposed to air were first exposed in April, 1917. It should be noted that all the sheets in four groups of low-copper bessemer and open-hearth steel and pure iron have failed, and that of the total No. 22 gage non-copper-bearing sheets 50 per cent have failed, whereas none of the copper-bearing sheets has failed.

The society has undertaken a series of field tests on hot-dip galvanizing, sherardizing, electro-zinc plating, zinc coating by spraying, cadmium plating, calorizing, chromium plating and terne coating. Sheets of No. 22 gage basic open-hearth steel, without copper, are to be exposed, and, in addition, castings of an approved form, made of both cast and malleable iron.

Wire test specimens of material to be determined by further consultation with the coated-wire industry are to be included in the test. In all cases uncoated control pieces are to be exposed.

New England Club Honors Past-Presidents

Badges Presented to Twelve Former Executives at 25th Anniversary Dinner—Mr. Shannahan Tells Plans of American Association—Officers Elected for Ensuing Year

THE New England Street Railway Club celebrated its 25th anniversary with a dinner held the evening of March 26 at the Copley Plaza Hotel, Boston. More than 500 were present. The feature of the evening was the presentation of badges to twelve of the 24 past-presidents of the club. These included H. E. Farrington, H. C. Page, W. D. Wright, Thomas Lees, Elton S. Wilde, John T. Conway, Clark V. Wood, R. W. Perkins, I. A. May, Edward Dana, Ralph D. Hood, and the retiring president, T. H. Kendrigan. In a humorous address C. C. Peirce of the General Electric Company, who acted as toastmaster, gave a brief history of the club and said that the members, principally the manufacturers, had felt that a fitting remembrance should be given to the presidents who had labored so faithfully for its success.

In his presidential address Mr. Kendrigan gave a review of the events of the past year and the progress that had been made by the club in that period. He was followed by the president-elect, L. D. Pellissier, who spoke briefly of his appreciation of the honor conferred upon him.

President John N. Shannahan of the American Association, the speaker of the evening, told of the work of the association and events which led to the appointment of Mr. Storrs as managing director, as well as of some of the problems now confronting the industry. An abstract of Mr. Shannahan's address is given elsewhere.

Mr. Storrs responded briefly, telling of the aims of the association and the responsibilities of the new arrangement.

Mayor Curley of Boston gave an interesting talk on the relations existing between the Boston Elevated Railway and the city. He expressed great satisfaction at the results which had been obtained by public control, and said that he was desirous of continuing the arrangement for a full twenty-year period. An abstract of Mayor Curley's talk appears elsewhere in this issue.

Following the addresses a vaudeville program entertained those present.

ELECTION OF OFFICERS

At an afternoon meeting officers for the ensuing year were elected as follows:

President: L. D. Pellissier, Holyoke, Mass.

Vice-presidents: H. F. Fritch, Boston, Mass.; J. K. Punderford, New Haven, Conn.; J. B. Crawford, Concord, N. H.; T. B. Jones, Burlington, Vt.; F. D. Gordon, Portland, Me.; E. A. Brown, Newport, R. I.

Secretary: J. W. Belling, Boston, Mass.

Treasurer: Fred F. Stockwell, Cambridge, Mass.

Executive Committee: W. W. Field, Cambridge, Mass.; C. H. Wood, Boston, Mass.; G. H. Martin, Boston, Mass.; H. M. Flanders, Springfield, Mass.; H. H. Hanson, Newtonville, Mass.; R. B. Stearns, Boston, Mass.; J. P. Alexander, New Haven, Conn.

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Broadening the American Electric Railway Association's Work*

Changing Conditions and Problems of the Industry Call for Greater Service from the Association—Appointment of Mr. Storrs Opens Up New Field of Endeavor

By J. N. SHANNAHAN
President American Electric Railway Association

ONE of the features of the electric railway business that keeps us fellows in it and draws in the younger men is the fascinating effect of change. The transportation industry is in a continuous state of evolution. I don't need to remind you men of the changes that have come in the last 30 years. These continual changes in the demand of the public for transportation service have kept transportation men on the jump. They make our work intensely interesting. They fill our lives with difficulties and troubles, but we do not break down under them—we try to meet each situation as it arises and give the public the best that is in us.

Speaking for myself, I think that perhaps our greatest fault is that we have been too prone to see only the things in our own back yards. We have gone about individually, studying our problems and doing our best to meet them. A great many times some of our neighbors have had similar difficulties and have come through them successfully, but we have paid little attention to what the other fellow did.

You all remember that it took a crisis to bring about collective action on our part in 1919. At that time the industry was in a bad way. We had been compelled to meet the increasing cost of materials and labor and had been prevented from increasing our income. President Wilson appointed the Federal Electric Railways Commission and before it appeared representatives of our industry from all parts of the country. For the first time in our history the public was informed of the facts concerning the street railway business. Since the Federal Electric Railways Commission made its report there has been a marked improvement in public understanding. Since then the financial condition of the industry has improved greatly. I believe that the service we are rendering is better, but, gentlemen, we have not yet rung the bell, and I don't believe that we will until you men in Massachusetts realize that success in our business depends in a large measure upon the successful conduct of the public transportation business in every other part of the country, and until the railway men in other parts of the country get it into their minds that their success is in a measure dependent on your success. I believe it was Patrick Henry who said something to the effect that if "we don't hang together we will hang separately," and another well-known quotation is that a house divided against itself cannot stand.

Now, we have made good progress at getting together, but we haven't gone as far as we must. The American Electric Railway Association, of which I have the honor to be president, represents about 90 per cent of the electric railway mileage in the country. In 1924 the electric railways of the country carried some 16,000,000,000 passengers. This was an increase of nearly 1,000,000,000 over the number carried in 1923, and this in the face of a tremendous increase in the number of automobiles. The American Electric Railway Association has done its best to inculcate a spirit of progressiveness in the minds and hearts of its members. It has encouraged and assisted member companies to carry on public relations work; it supplies them with a large amount of information on operating problems; through its various committees it is rendering a service that is of inestimable value to you. But there is a point beyond which the association cannot go. It cannot deal with questions of management, questions of relations between the individual members and the public they serve, questions of policy with reference to local conditions. It can and does reflect the opinion of the industry as a whole in its announcements and the recommendations that are made at its conventions, but these have not always been adequate to meet a given problem.

BETTER OFF, BUT STILL SOME TROUBLES

While as an industry we are better off financially and otherwise than we were in the bad old days of 1919, we are still having our troubles, and they are not altogether of our own making. You don't have any interurban railway lines in New England that are comparable with those in the Middle West, where the hauls are long and the lines are paralleled by state highways, over which in many states unregulated motor vehicle competition has been rife. Within the last four months two of the largest interurban railways in the country have been forced into receivership, largely because the public had not recognized the essentiality of the service rendered. Several legislatures now in session have enacted laws which will help to preserve to the public the service that is indispensable, but many of the railways have suffered damage that is very serious, and it will be some time before some of them will have completely recovered.

It has been in the minds of some of us for a long time that a way must be found to render the electric railways greater service than can come through routine association activities. This thought led to the suggestion that there should be a committee or council of men representing not only the operators of the electric railways, but also the owners of them, this council to give its best thought and advice toward leading the industry to permanent prosperity. Acting on this suggestion there has been created what is known as the Advisory Council of the American Electric Railway Association. These gentlemen quickly determined that to work out their ideas and policies they needed the services of a man who would have the whole-hearted respect of every electric railway man in the country, who would have those personal qualities that make a man attractive, whose technical knowledge would make his advice authoritative, and whose vision would be so broad as to make it possible for him to see into the future. I am happy to say that one of your members was chosen for this position—Lucius S. Storrs. Mr. Storrs will assume the position of managing director on April 2. He will give his entire time to the problems that confront us. He is at your service, whether you operate in New England, in Kansas, in California, or wherever you may be. You can talk to him as a brother and he will talk the same way to you. He knows the public transportation business from "A" to "izzard" and I know that nothing will give him greater pleasure than to feel that he can be of real service to you.

STORRS APPOINTMENT INDORSED

Since the announcement of the appointment of Mr. Storrs was made at our Midyear Meeting in Washington, I have received scores of letters and telegrams indorsing the action of the association. The feeling is general that this is the most important step the industry has ever taken. We believe it is, but let me say now that the accomplishments of the Advisory Council and of Mr. Storrs will be measured entirely by the co-operation which they get from the electric railway interests. Every electric railway company in the United States and every manufacturer of goods which are used by electric railways should give the council and Mr. Storrs their whole-hearted support, both moral and financial.

A few minutes ago I said that our industry is continually changing. With its evolutions there come new problems, not only in the practical operating of our business, but in matters concerning regulation and legislation. All of us are in a measure feeling our way. We find the public demanding motor vehicle transportation, and we also find that if we do not meet that demand somebody else will. The jitney hit us a hard wallop, and by the time the public had discovered that jitney competition was more ruinous to its own interest than it was to the electric railway, although we all know it did much damage to us, there had developed the bus.

Now the bus is merely a new tool for electric railways to use wherever it will fit best. I do not mean to say that you men should put on a lot of buses in response to clamor from a noisy minority and run those buses under conditions and on fares that will not return a profit to you—not at all; but I do believe that where bus service can be rendered with profit to the public and to the railway company, it is in the interest of the public that the railway company should run the buses. Only surveys of local territory by competent persons will determine whether and

*Abstract of an address at the annual dinner of the New England Street Railway Club, Boston, Mass., March 26, 1925.

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how buses should be run, but once the decision to run them is made it devolves upon the electric railway management to see that the same care is taken to maintain schedules and to render service that is characteristic of their rail lines.

And in that connection there arises the question of protection of the established rail and bus lines against unfair competition. Massachusetts is one of the very few remaining states in the Union that have neglected to give the railways the protection to which they are entitled. You were one of the first states to establish the principle of state regulation of public utilities. But Massachusetts has been slow to protect the railways which it regulates. Unless your Legislature has acted within the last few days, you have no law authorizing your Department of Public Utilities to determine whether public convenience and necessity calls for the establishment of highway motor vehicle lines that would compete with steam and electric lines. Certainly such authority should be given your public utility regulatory body. It is obviously in the public interest.

Highway Interstate Commerce

In many ways the attitude of New England toward the electric railways has been progressive and enlightened. Here you have recognized that the investors are entitled to fair pay for the work their money is doing for the public. Here in Boston and in most of your large communities you have found the 10-cent fare to be necessary and your people recognized the justice of it. Under the public trustee acts, under which the Boston Elevated and the Eastern Massachusetts systems operate, the return to the investors is limited to 6 per cent, certainly a small enough return. Yet there are many companies that are not earning even 6 per cent, though they are rendering service that is as vital to the prosperity of the communities as the air we breathe.

Because of the dense population of New England, the closeness of your important communities to each other and the wonderful system of highways that has been developed by your states, and the close relations of the people in the different communities to each other, there has developed in the last two years an interstate motor vehicle business that has reached considerable proportions. Under the decision handed down by the United States Supreme Court on March 2, the states are without power to regulate this interstate business except so far as the safety of the public and the preservation of the highways themselves are concerned. As matters stand the states cannot deprive anyone of the right to operate interstate highway vehicles for hire, nor can the states regulate the rates of fare to be charged nor the quality of the service to be rendered. The coming summer may see your highways filled with vehicles competing not only with the steam and electric lines, but with bus lines which had been established in response to public demand, and which are subject to state regulation.

There can be no doubt in anybody's mind that this situation cannot continue without tremendous damage being done to the interests of the people on the one hand, and to the interests of all regulated common carriers on the other. It seems to me, and I feel sure it is the belief of others who have given the subject any study, that the Interstate Commerce Commission, perhaps jointly with the state commissions, should be empowered by Congress to exercise regulatory powers over interstate highway carriers. The Interstate Commerce Commission can be relied on to protect the public interest. Its long experience has given it understanding of the place which the various agencies of transportation occupy in the life of the communities. Before this authority can be given to the Interstate Commerce Commission, or anything can be done to increase the jurisdiction of the state commissions by Congress, however, there probably will be a great deal of harm done to the established rail and bus lines. This, of course, is extremely regrettable, and we all must hope that the condition will be remedied as quickly as possible.

Results with Public Control*

The Agreement Between the State of Massachusetts and the Boston Elevated, Made in 1918, Has Proved a Wise One and Should Be Extended for Twenty Years

By Hon. James M. Curley
Mayor of Boston

IT HAS been my very great pleasure to associate during the past 24 hours with the guest whom the street railway men are tonight honoring, and whom the city of Boston esteems it an honor to have within its gates, President Shannahan. Through his courtesy to me, and that of the presiding officer, I am permitted to come here and say just a word.

We are very proud of the officials in charge of our street railway transportation system. I am deeply in sympathy with their efforts to turn an annual deficit into an annual profit, because they owe us $1,700,000, and we could use the money.

At no time during the evolution—or revolution period, if you will—of street railway transportation has the public of New England, or that portion represented by the city of Boston, had a better realization or a more true perspective of the value of street railway transportation to the development of the community, or looked upon it with a more kindly spirit or a greater desire to be of assistance, than at the present hour.

What was deemed revolutionary in 1918 with reference to the Boston Elevated System is now regarded, after the passage of seven years, as the wisest character of legislation, and a plan that might be tried with profit by every section of the entire United States of America.

We gave them a peculiar charter in 1918. We have permitted a concern which was almost on the verge of bankruptcy to go before the General Court and receive a warrant which permitted it to charge any rate of fare which it saw fit, and in the event of its inability in any year to meet its expenditures in operation and the payment of its dividend, to assess its deficit on the cities and towns in which it operates.

It rather savored of the old days when what is now Manhattan was exchanged for a string of glass beads, but we feel that it has been a wise investment and the Boston Elevated System is now before the Legislature seeking further legislation, and two propositions are being considered—one the question of direct ownership by the cities and towns through which the road operates, which at a recent hearing had but one supporter to the project, and the other an extension of the franchise granted in 1918 for the period of twenty years. It is my firm belief that the Legislature in its wisdom will reject the proposal for a year's further study of the project, and, recognizing the need of adequate railway transportation, will grant an extension of the existing franchise for a further period of twenty years.

The whole public attitude with reference to street railway transportation has undergone a transition, if you will, during the past three years. We are beginning to realize that the competition of motor buses has been a serious competition in cities outside of Boston, and would have been a serious competition in Boston were it not for the fact that the Mayor of Boston recognizes that a street railway transportation corporation cannot do business on good wishes and promises, and that it requires something more substantial than it is possible to develop with outside competition which will operate only when the sun shines and roads are in good condition, and the remainder of the year compel people to use that which God gave them as a means of locomotion, before the birth of Henry Ford.

So we are taking a different view of the proposition. Our perspective has been broadened, and we are beginning to appreciate that street railway transportation has passed the stage of a non-essential; that it is an absolute essential for the conduct of business activity, and for the convenience of those members of the public who either find it impossible to own a car, or have difficulty in retaining in their service men who are competent to operate cars. And, taking that view of the proposition, we do not believe that it is a violation of the law, and we do not believe that it is bad judgment, to consider it in the same light as we do other essentials to the development of the prosperity and the happiness of society, such essentials as water, public sewerage, public lighting, public health, and public education.

*Abstract of an address at the annual dinner of the New England Street Railway Club, Boston, Mass., March 26, 1925.

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We realize that no one individual, unaided, can maintain a personal transportation system of his own, and considering it in the main essentials we recognize that it is necessary, when support from its patrons is insufficient to meet the cost of operation with a reasonable return to the investors of a street railway transportation system, to make direct levies on the taxpayers for the maintenance of that institution, and contribute the money to the street railway companies that are operating in the community. So that it is a great pleasure to me, as the Mayor of a city which has considered with some intelligence and with some degree of generosity its street railway transportation, to come before you men and express the wish, aye, the hope, that the same intelligent direction and the same generous spirit which have made possible the continued existence of the Boston Elevated transportation system, will be in evidence before the 26th banquet of this organization in every intelligent community in New England, and that means every city and town in all New England.

Electrical Night at N. Y. R.R. Club

AT THE second "electrical night" meeting for the season of the New York Railroad Club, held on March 20, William B. Potter, chief engineer railway department, General Electric Company, spoke on "The Latest Developments in Electric Locomotive Design." The main floor of the auditorium of the United Engineering Society's building in New York City was filled to capacity, indicating keen interest in recent developments in electric motive power.

Electrification Progress

Mr. Potter said, first, that while electrification of steam railroads had not come about as rapidly as had been hoped for, substantial progress had been made. He quoted data from the recent report of the statistical department of the Chicago, Milwaukee & St. Paul Railway, showing substantial savings from the electrification. (See ELECTRIC RAILWAY JOURNAL for Feb. 28, 1925, page 338). The electrification was, therefore, not responsible for the railroad's recent financial difficulties. He also touched briefly upon recent foreign electric locomotives, particularly with reference to the problems involved in the use of siderods, which are popular abroad. Pictures of an experimental type of geared drive, with the gears outside the bearings, were shown on the screen as an example of recent studies in the line of simplification. The utilization of electric motive power, said Mr. Potter, should be along lines of the natural characteristics of this motive power, not along steam locomotive lines. Perhaps the electric locomotive of the future will be more like the trolley car, with bogie trucks, rather than like a steam locomotive. He showed pictures of locomotives recently supplied for operation in Mexico, between Vera Cruz and Mexico City, where regeneration is an important factor. Reference was made also to the type of locomotive being built for the New York, New Haven & Hartford Railroad, on which 600-volt direct-current motors will drive the axles. A motor-generator set will convert the 11,000-volt, single-phase alternating current into direct current.

Gasoline and oil engines were regarded by Mr. Potter as bound to play an important part in transportation in the future on account of their high efficiency. With these engines the rail car offers an opportunity to save operating expenses on lines of light traffic, and the bus has its place also. Electric speed reduction is preferable to mechanical in such vehicles, on account of its flexibility.

In conclusion, Mr. Potter explained the construction of the "otheograph" (see ELECTRIC RAILWAY JOURNAL for Aug. 25, 1923, page 294), by means of which the vertical and lateral stresses in track can be recorded as locomotives and cars pass over it at any desired speed.

Radio for Railways

Mr. Potter was followed by G. Y. Allen of the Westinghouse Electric & Manufacturing Company, who, speaking on "Radio on Railways and Elsewhere," described the principles of "wired wireless," in which power lines can be used for telephone transmission without interfering with their main function. Direct application to railroading has been slow due to the demand for radio apparatus in other fields, but transmission of signals from end to end of long freight trains on electrified railroads has been developed.

H. H. Vreeland, Elisha Lee and D. M. Brady then spoke briefly on the value of membership in the club, and a high-class vaudeville entertainment followed. There was no discussion of the technical papers. Refreshments were served at the close.

The program was in charge of a special committee consisting of W. G. Gove, chairman; J. S. Doyle and H. H. Norris.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 9—Central Electric Railway Master Mechanics' Association, Hotel Keenan, Fort Wayne, Ind.

April 16—Wisconsin Utilities Association, Hotel Pfister, Milwaukee, Wis.

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Central Association to Meet at French Lick

THE annual summer meeting of the Central Electric Railway Association will be held at French Lick Springs, Ind., on June 2, 3 and 4. Arrangements are under way to assure a profitable and enjoyable meeting. A program of the business sessions will be published when completed.

Special rates have been made by the hotel company. The amusement facilities of French Lick include two eighteen-hole golf courses owned by the hotel company. Natural surroundings also offer an excellent opportunity for hiking, horseback riding and other outdoor sports. A swimming pool is included in the facilities. A large room in the recently completed addition to the hotel is available for light exhibits of manufacturers who may desire to send samples of equipment to the meeting.

Reservations should be made directly with the hotel company.

Internationaler Strassenbahn und Kleinbahn Verein

THE Internationaler Strassenbahn und Kleinbahn Verein (Street and Interurban Railway Association of Central Europe) will hold its next annual meeting June 21-25, 1925, at Budapest. The twelve subjects announced for discussion are as follows: "Railways in Hungary"; "The von Kando Alternating-Current Locomotive"; "Schedule Speeds on (a) Street Railways, (b) Interurban Railways"; "Recent Developments in the Design and Construction of Automatic Substations"; "Electrically Welded Rail Joints"; "Thermit Joint Welding on Exposed Track"; "Design and Operation of New Types of Street Railway Cars"; "Safety Precautions at Grade Crossings, at Which There Are No Flagmen"; "Developments in Internal Combustion Engines for Independent Units on Interurban Railways"; "Different Methods of Securing Economy in Suburban Rail Service"; "Present Status and Recent Developments in Construction and Operation of Auto-Motor Cars (a) for City Service, (b) for Interurban Service"; "Effect of the Auto Bus on the Street Railway."

Second Regional Motor Conference in May

THE second regional motor transportation conference under the auspices of the National Automobile Chamber of Commerce is announced for Chicago on May 26-27. The main theme, as in the first conference in Boston, will be the co-ordination of bus and truck uses with railway facilities.

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Central Master Mechanics' Program

THE next regular meeting of the Central Electric Railway Master Mechanics' Association will be held at Hotel Keenan, Fort Wayne, Ind., commencing at 9 a.m., Thursday, April 9.

The program will include a talk by a steam railroad representative on interchange rules, reports of committees, and such other business as may be properly presented. There also will be a round-table discussion on matters of interest to the members attending. Some time will also be devoted to inspection of the shops of the local street railway.

American Association News

Mr. Storrs Takes Office

Railway Financing and Problems Arising from the Operation of Buses Will Receive Attention

LUCIUS S. STORRS, who recently was appointed managing director for the traction industry by the American Electric Railway Association, opened his office at 292 Madison Avenue, New York City, on April 2. Mr. Storrs, who is an executive of wide experience and particularly well known for his ability to deal with the public, will act largely as a general adviser and guiding hand for the electric railway interests, large and small.

Entrance of Mr. Storrs into the national electric railway situation is a part of the general modernization movement, according to a statement issued from association headquarters. Major problems facing the industry include co-ordination of electric railway and bus service, financing of extensions and betterments, and the procuring of legislation for the regulation of interstate bus traffic. Adoption of the bus as an integral part of electric railway service is becoming general throughout the country. At present about 200 electric railway companies are using the bus in supplemental service. In further co-ordination of bus and electric car service, Mr. Storrs' advice will be valuable. As president of the Connecticut Company, which operates practically all the electric lines and many buses in Connecticut, he had long experience with bus service. Ever since the bus began to occupy a place in local transportation, Mr. Storrs has been actively associated with joint committees of the automotive and electric railway groups.

Financing is occupying a prominent place in the traction picture now. Prior to his entrance in the electric railway business, Mr. Storrs was president of the New England Investment & Securities Company, and also now is a director of the Union Trust Company of Springfield, Mass. After becoming associated with the Connecticut Company he successfully financed that property despite the general gloomy attitude entertained by bankers regarding tractions.

The interstate bus situation is probably the most pressing immediate problem that Mr. Storrs must face. It was brought to a climax by the recent decision of the United States Supreme Court which put the determination of the convenience and necessity of interstate lines beyond the power of the state commissions. The Interstate Commerce Commission having held that it has no authority for highway transport, there now appears to be no regulatory authority controlling buses. Any relief which is effected probably will have to come through Congress, and doubtless legislation will be sought by the various interested industries.

Exhibits

SEVERAL of the members of the convention committees on exhibits and entertainment held a preliminary meeting at Atlantic City on March 20. Members present were: C. E. Morgan, chairman exhibit committee; S. J. Cotsworth, chairman entertainment committee; J. W. Welsh, executive secretary; F. C. J. Dell, director of exhibits; J. C. McQuiston, A. J. Purinton, A. M. Robinson and L. W. Shugg. Mayor E. M. Bader of Atlantic City and representatives of the local interests were also present. Satisfactory arrangements were concluded for the use of Young's Million Dollar Pier and for the decorations and other arrangements.

An innovation has been made this year by arranging for the construction of a temporary railroad track so that electric cars can be placed on exhibit without the difficulties of transportation to and from the pier that have been encountered in past years.

It was recommended by the exhibit committee that Wednesday, Oct. 7, be set aside for the inspection of exhibits, the same as the corresponding day last year. It was also recommended that the association look with displeasure on any exhibit or demonstration of buses elsewhere than on the pier.

A sub-committee was appointed to assist in securing exhibitors, as follows: Morris Buck, chairman; T. W. Casey, L. W. Shugg, B. E. Tilton, New York district; A. M. Robinson, S. J. Cotsworth, Philadelphia district; Thomas Fitzgerald, J. C. McQuiston, Pittsburgh district; A. L. Price, R. C. Snell, Cleveland, Detroit and Toledo districts; H. H. Adams, J. R. Fitzpatrick, L. E. Gould, Chicago district; G. L. Kippenberger, St. Louis district; R. H. Dalgleish, Washington district; H. B. Potter, Baltimore district; G. H. Clifford, Southern district.

Other sub-committees appointed were: Decorations—J. C. McQuiston, chairman; L. W. Shugg, F. C. J. Dell; space—H. B. Potter, chairman; L. E. Gould, G. H. Clifford; power—T. W. Casey, J. R. Fitzpatrick, A. L. Price; car and bus exhibits—A. J. Purinton, chairman; S. J. Cotsworth, R. H. Dalgleish, G. L. Kippenberger, A. M. Robinson; insurance—J. W. Welsh, F. C. J. Dell; co-operation with entertainment committee—Morris Buck, chairman, H. H. Adams, B. E. Tilton.

Equipment

A MEETING of the equipment committee of the Engineering Association was held in Cleveland, Ohio, on March 16 and 17. Those present were: P.V.C. See, chairman; W. S. Adams, R. S. Bull, A. T. Clark, L. H. Fry, J. M. Hipple, W. H. McAloney, J. C. McCune, M. O'Brien, E. S. Sawtelle, W. G. Stuck, H. S. Williams, G. L. Schermerhorn representing E. D. Priest, Robert Long representing J. L. Gould, and D. C. Fenner and J. S. McWhirter, visitors.

In connection with the review of existing standards, the committee considered it desirable to give further attention to the matter of clearances for bearings, in order that these might be definitely specified. The specifications for proof-testing of forgings as submitted by sub-committee No. 1 were approved. In regard to wheel mounting and check gages, it was decided to recommend two gages, one for mounting wheels and the other for checking the gage of wheels after they are mounted. The mounting gage is to be made up without tolerance, and the checking gage with tolerance. The present standard gage should be revised to change the slope of the wheel tread from 1 in 25 to 1 in 20. The suggestion that a gage be made up to determine when wheels should need further attention was disapproved. Questions of proper tolerance for bore of gears and the revision of plain gages for wheels and permissible eccentricity of axles were discussed, and it was decided that further information should be obtained.

The sub-committee on brakes and foundation brake rigging made a very complete report. This included definitions of the various brake equipment parts, methods and formulas for computing stresses in foundation brake gear, frequent causes for poor braking conditions and recommended practices for overcoming troubles. This was reviewed and several changes were suggested. The sub-committee will revise this report and submit it for further consideration. Car painting was discussed and the committee on this subject reported that a questionnaire had been sent out. As soon as replies are received, these will be tabulated for further consideration.

The minutes of a meeting of the motor coach committee of the Society of Automotive Engineers, held on March 9, were read and the members of the equipment committee decided to co-operate in the work as outlined.

The subject of reduction of car noise was reported on by the sub-committee, and discussion of the work brought out the fact that certain tests were desirable. In order to carry out the tests properly, instruments and various testing equipment would be needed. The committee decided to recommend that the subject of tests in connection with car noise be referred to next year's equipment committee with the recommendation that an appropriation be made to cover the cost of instruments necessary for making the tests.

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to be used in making the various tests. The committee reported that a questionnaire had been prepared and would be sent out.

Reports of the chairman of the various sub-committees brought out the fact that members have been delinquent in answering correspondence, so that many reports have been held up, awaiting replies. More prompt attention is necessary if the large amount of work assigned to the committee for this year is to be completed.

Rapid Transit

THE first meeting of the rapid transit committee for the year 1924-1925 was held at association headquarters, New York City, on March 27, with the following members in attendance: G. A. Richardson, chairman; J. H. Alexander, C. E. Smith, D. L. Turner, James Walker, R. B. White and W. B. Bennett.

A discussion of the objects of the committee was followed by a discussion of its activities during the previous year. It was pointed out that a start was made last year in the compilation of statistical and historical data covering the principal cities in the United States and in foreign countries in which rapid transit facilities are in operation; and also similar data for those cities in the United States whose populations have reached a point where rapid transit facilities either have been under consideration or may in the near future be under consideration. It was agreed that this information would be of incalculable value in studying rapid transit developments to date and in furnishing information for guidance in the near future.

Mr. Walker, who compiled this data, stated that some companies had not responded in furnishing the information requested. After considerable discussion it was the consensus of opinion that an attempt should be made immediately to arouse the interest of those companies with a view to securing their co-operation in furnishing the desired information. Mr. Richardson suggested that Mr. Storrs personally write to the executives of the companies in cities of 500,000 population or more, pointing out to them the value of the work this committee proposes to do, and thereby attempting to secure their co-operation in furnishing the necessary data. This letter is to be accompanied with a questionnaire outlining the data desired.

The following subjects were discussed as being worthy of consideration and possibly of inclusion in the final report:

Forms of rapid transit other than elevated or subway for cities having populations from 500,000 upward. It was pointed out that in some instances street widening would permit the construction of tracks in a ballasted central portion either with or without grade crossings, depending upon the particular local conditions. On such tracks a form of express service might be operated which would result in very much higher schedule speeds than are possible at present on surface lines under ordinary conditions. Such construction could readily be made with a view to the later installation of elevated or submerged tracks when traffic conditions warrant the additional investment.

Possibilities of materially increasing schedule speeds on ordinary surface lines by strict police regulation of traffic designed to keep the tracks clear of other vehicular traffic during the rush hours.

Methods of financing rapid transit facilities, i.e., whether or not such facilities should be constructed with private capital by general taxation in the community, by assessment against abutting property (the value of which would be greatly enhanced by the rapid transit facilities) or by combinations of any of these methods.

Enhanced value of property resulting from the installation of rapid transit service in the community.

The general discussion covered many phases of rapid transit service, including the use of motor buses as feeders to rapid transit lines. There was unanimous agreement that all facilities of whatever kind should be co-ordinated into a single unified system in the interest of the community served.

Two Convention Committees Named

THE personnel of two important convention committees, those on exhibits and entertainment, has been completed and was announced recently by President Shannahan. The complete list of names follows:

EXHIBITS

C. E. Morgan, vice-president and general manager Brooklyn City Railroad, Brooklyn, N. Y., chairman.
H. H. Adams, Chicago, Ill.
Morris Buck, New York, N. Y.
T. W. Casey, New York, N. Y.
G. H. Clifford, Fort Worth, Texas.
S. J. Cotsworth, Philadelphia, Pa.
R. H. Dalgleish, Washington, D. C.
Thomas Fitzgerald, Pittsburgh, Pa.
J. R. Fitzpatrick, Chicago, Ill.
L. E. Gould, Chicago, Ill.
G. L. Kippenberger, St. Louis, Mo.
J. C. McQuiston, East Pittsburgh, Pa.
H. B. Potter, Baltimore, Md.
A. L. Price, Mansfield, Ohio.
A. J. Purinton, Atlantic City, N. J.
A. M. Robinson, Philadelphia, Pa.
L. W. Shugg, Schenectady, N. Y.
R. C. Snell, Cleveland, Ohio.
B. E. Tilton, Syracuse, N. Y.

ENTERTAINMENT

S. J. Cotsworth, sales agent Lorain Steel Company, Philadelphia, Pa., chairman.
G. A. Barnes, New York, N. Y.
Carl H. Beck, New York, N. Y.
E. J. Blair, Chicago, Ill.
H. L. Brown, Mansfield, Ohio.
F. A. Elmquist, New York, N. Y.
E. C. Faber, New York, N. Y.
C. E. Hale, Pittsburgh, Pa.
J. W. Hancock, Roanoke, Va.
H. J. Kenfield, Chicago, Ill.
G. R. Lyman, New York, N. Y.
C. E. Morgan, Brooklyn, N. Y.
L. H. Palmer, Baltimore, Md.
W. C. Parker, Lansing, Mich.
C. L. Pierce, Jr., Pittsburgh, Pa.
Harry Reid, Indianapolis, Ind.
W. J. Stanton, New York, N. Y.

Engineering Symbols

A MEETING of the committee on engineering symbols was held at association headquarters, New York City, on March 30. Those present were: H. R. Stamm, chairman; R. C. Cram, sponsor; H. W. Codding, C. W. Squier and W. J. Quinn, representing J. F. Neild.

A large number of symbols were submitted by various members of the committee for consideration. These symbols were divided into six classes: (1) Topographical; (2) buildings and structures; (3) electrical; (4) railroad; (5) mathematical; (6) mechanical.

Topographical symbols used by the United States Geological Survey and by the committee on national defence maps were considered by the members in connection with those suggested in the Engineering Association Proceedings of 1915. As symbols used by the United States Geological Survey are printed in three colors, it was decided to use the symbols suggested in 1915, together with additional ones from the United States Geological Survey and committee on national defense maps, which could be shown in black and white.

Standard symbols for the electrical equipment of buildings as approved for a tentative American standard by the American Engineering Standards Committee were considered as satisfactory. Two sheets of architectural symbols were submitted for consideration. Symbols for heating and ventilating, as shown in a preliminary draft code of the American Society of Heating and Ventilating Engineers, were submitted, together with symbols used by several manufacturers of heating and ventilating equipment. It was decided to use those approved by the Society of Heating and Ventilating Engineers, together with any additions from the manufacturer's design, which were considered essential. A sheet of symbols on reinforced concrete, taken from the Structural Engineers' Handbook by Milo S. Ketchum, was submitted for criticism, together with symbols for structural mechanics taken from the same source. These were considered satisfactory by the members of the committee present, and they are to be sent to other members of the committee for consideration and criticism.

Several hundred symbols for electrical equipment were submitted for consideration. The number of these was reduced to approximately 75, which were considered essential for electric railway use. Sheets embodying these 75 symbols are to be prepared, and submitted for further consideration.

The symbols for track and rail as submitted in 1915 were considered satisfactory. These are to be supplemented by additional symbols which have been suggested as important to be incorporated in the report. Several sheets of symbols as used by the Railway Signal Association were submitted for consideration. These are to be sent to all members of the committee for their criticism and suggestion as to the ones which should be incorporated and for any modification, should that appear desirable. A sheet of mechanical symbols embracing desirable additions is to be prepared.

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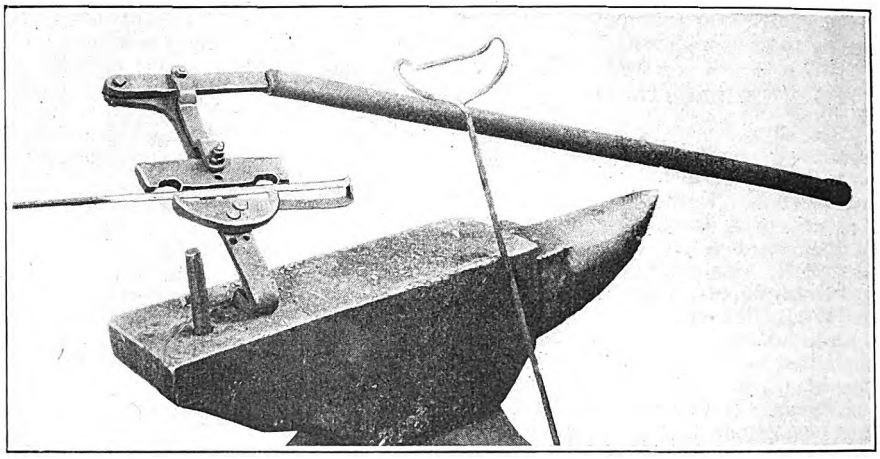
Maintenance of Equipment

Forming Handles at Ends of Iron Rods

A CONVENIENT fixture for bending the ends of switch levers, underground conduit cleaning rods and other similar devices used by electric railways has been devised by C. P. Westlake, supervisor of equipment, Eighth Avenue Railroad, New York City. The supporting member of the fixture is arranged to fit into the hardie hole of the anvil, so that it is convenient to forge and tools. The part of the fixture used to bend the rod has two parts, one stationary and the other movable. The stationary part has the shape of the inside of the handle and the movable part when it is pressed down forms the upper portion. Pressure for the bending operation is obtained from a handle with fulcrum at the end acting through a link to the movable part. A pipe extension is used to provide necessary pressure through increased leverage.

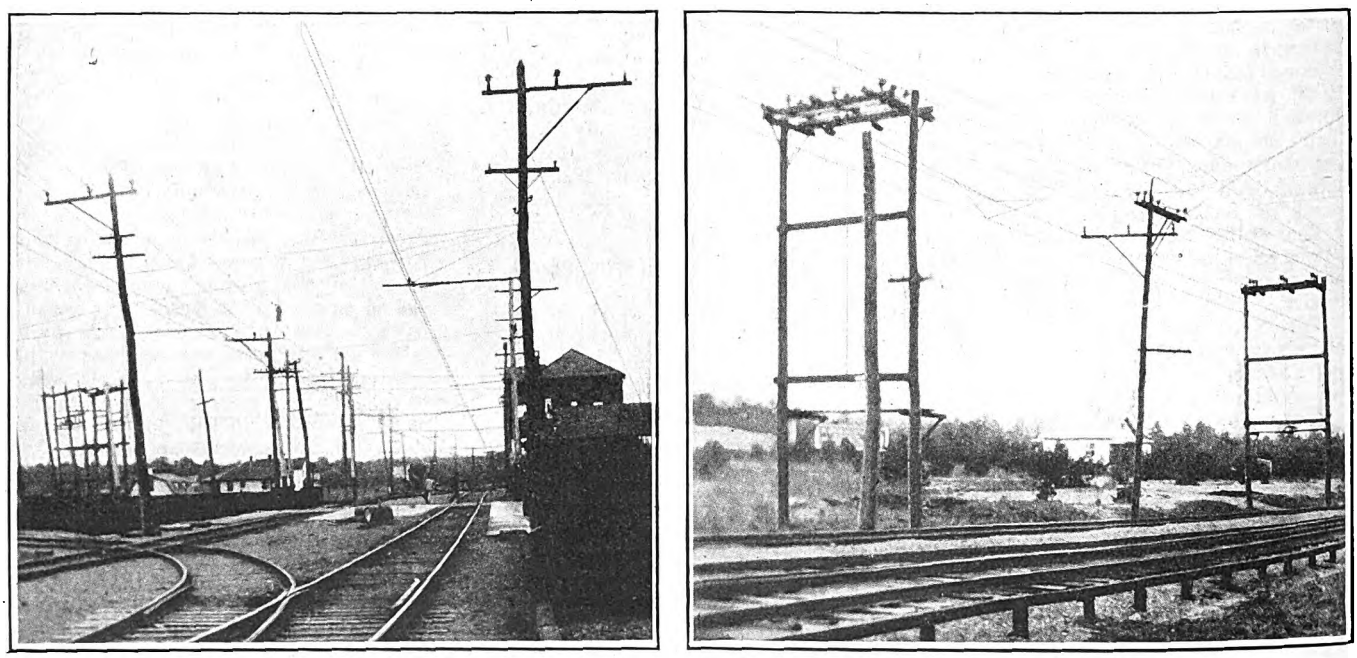
To bend the end of the rod into the shape desired, the end is heated at the forge and is then placed in the fixture with the end of the rod coming up against a stop, so as to determine accurately the amount of material to be used for the outside end of the bend. The movable part of the fixture is then pressed down by operating the handle, and the upper part is thus shaped. The long part of the rod is then bent down around the stationary part of the fixture, so as to form one side of the handle, and the short side of the rod is bent around the other side of the stationary fixture to make the complete handle. The accompanying illustration shows the fixture with a rod in position ready to start the bending. A completed rod with handle formed is also shown at the right. This is used for cleaning dirt out of the underground conduit.



Fixture Used for Forming Handles at the End of Rods

Span Wires Replace Bracket Arms

IN MAINTAINING its overhead lines, the Washington, Baltimore & Annapolis Electric Railroad has followed the practice of replacing the bracket arms from which the trolley wire is suspended by span wires, as shown in an accompanying illustration. From Baltimore to Washington this railway has double track and the overhead structure is supported by wood poles on both sides of the track. Catenary construction is used and ⅜-in. hard steel messenger wire formerly was suspended



At Left, Old Arrangement with Messenger Wire Suspended from Bracket Arms. At Right, Messenger Wire Is Now Suspended Directly from Span Wires with Guys to Hold Trolley Wire in Position

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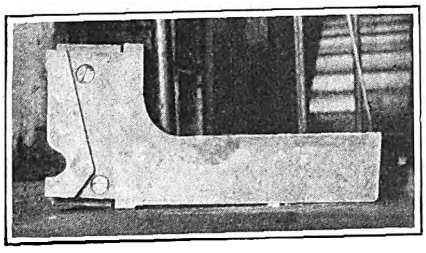
from bracket arms extending over the track from the poles. Span wires acted as guys for the bracket arms and connected opposite poles. More recently the arms have been eliminated and the No. 0000 copper trolley and steel messenger wires are suspended by a triangular rigging as illustrated.

Finishing Wheel Tread and Flange at One Setting

STEEL-TIRED wheels are finished at the Unionport Road Shop, New York City, of the New York, Westchester & Boston Railroad with a tool accurately shaped to conform to the tread and flange contour. After the rough cuts are taken in the wheel lathe, this tool is used to



Cutting Tool Used for Finishing Wheel Tread and Flange at One Setting

finish the turning operation. It provides a very accurate contour and also saves considerable in the cost of turning.

The cutting part of the tool is of tool steel, welded to a steel plate which screws to the end of the tool shank. This provides a renewable and removable cutting surface. At the same time it permits the use of a high quality of tool steel for cutting, with a lower grade material for the shank. An accompanying illustration shows the construction.

Accurately Fitted Bearings Have Long Life

THE use of plastic bronze for armature bearings instead of babbitt-lined cast-iron shells was begun in April, 1921, on the Utica lines of the New York State Railways. Particular attention was given to the boring of the new bearings, a clearance of 0.006 in. over the actual size of the armature shaft being allowed. After two years of service covering approximately 147,000 miles, the first car fitted out was brought in for a grounded armature. The bearings were examined carefully, and measurement showed a wear of 0.003 in. over the original clearance. Since the total clearance of 0.009 in. was not considered excessive the bearings were reinstalled and continued in service.

Bearings are bored on the same horizontal boring mill that is used for wheels. A special fixture has been designed which is capable of holding the two housings of the motor in a horizontal position. A boring bar of special construction is fastened to the spindle of the mill. This has a center bearing with micrometric adjustment to take up wear. Two bearings are bored in position at one time.

New Equipment Available

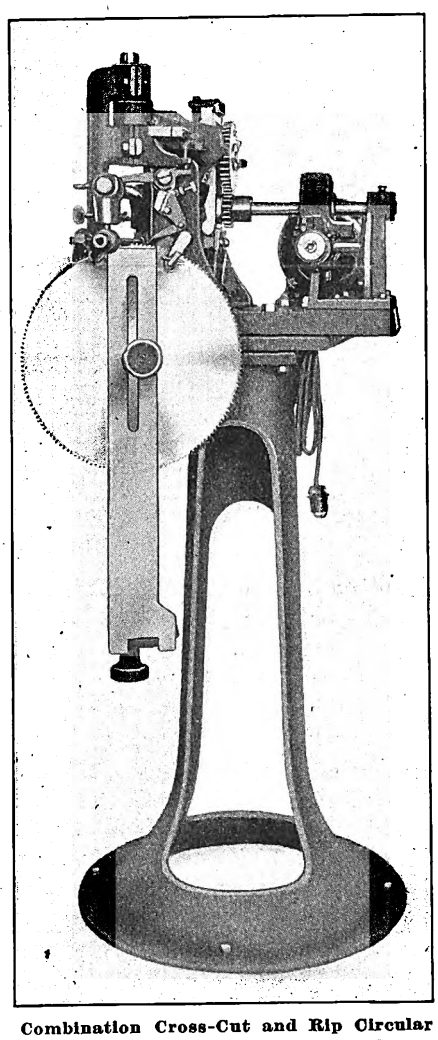
Circular Saw Filer

TO MEET the demand for an automatic machine to sharpen circular cross-cut and rip saws, the Wardwell Manufacturing Company, Cleveland, Ohio, has brought out a type known as the model Y. This has a capacity for filing all types of circular saws up to 18-in. diameter with teeth from the smallest up to ½ in. from point to point.

Among the special features of construction is the oblique elliptical movement of the filing arm, which gives the same stroke to the file as in hand work. A cam is connected to the main drive shaft. This cam raises the slide frame at a slight angle out of the vertical, which gives an oblique movement to the file and allows it to enter and leave any hook of tooth. A hardened steel roller on the point of the cam operates the horizontal slide filing arm. Two adjustments are provided for the movement of the lever attached to the swiveling head. One of these adjustments covers the length of stroke and the other the amount of cut removed from the face of the tooth. An elevating screw raises or lowers the saw at the point of filing.

The swiveling movement of the head and saw vise is secured through a 2 to 1 gear connection from the main drive shaft. The saw is turned alternately from right to left an amount depending on the degree of bevel to be given the teeth. The teeth of cross-cut saws are thus consecutively sharpened with alternate bevels through the swiveling of the saw between the stroke of the file. Ripsaws whose teeth do not require beveling are filed straight across by slipping the gears out of mesh and tightening the vise head in position at right angles to the file. The saw vise is easily removed for cleaning when necessary.

The machine can be furnished either for belt drive or with a direct-connected motor mounted on a pedestal. The bench type machine



Combination Cross-Cut and Rip Circular Saw Filer Mounted on Pedestal

weighs 165 lb. When mounted on a pedestal, the weight is 315 lb. The machine can be operated at a speed sufficient to sharpen 65 teeth per minute. Standard triangular files are used of a size depending on the size of the teeth to be sharpened. These files can be used for their entire length and on all three sides.

Crane Control

A DEVELOPMENT that is of value where reversing and non-reversing direct-current motors are used is the new magnetic time controller marketed by the General Electric Company of Schenectady,

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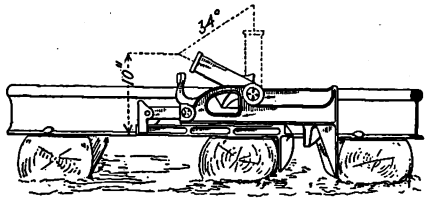
N. Y. This control has been especially designed for use with cranes and hoists.

Among the advantages claimed are ease in repair, well constructed and easily accessible parts, simplicity in wiring and a strong angle iron frame on which the control is mounted. Bases are moisture resisting, being constructed of a strong compound and chosen for their dielectric strength.

A time limit scheme of acceleration is provided when starting and current limit for plugging when reversing. Controls are provided with instantaneous electrical reset overload relays.

Tie-Spacing Cap and Shoe for Jacks

A CAP and shoe which can be instantly applied to Simplex track jacks, so as to adapt them for spacing ties, is being placed on the market by Templeton, Kenly & Company, Ltd., Chicago, Ill. To straighten skewed ties, the toe of the tie-spacing shoe engages the tie below the



Spacing Cap and Shoe in Position on Track Jack for Spacing Ties

center, while the base of the jack presses against the adjacent tie.

This device can be placed on any Simplex track jack. But two new parts are required, the cap and the shoe. The cap is a drop forging and is recessed to hold the shoe. It serves the purpose of the old cap by keeping the rack bar from coming out and also provides the shoe attachment. A greater safety feature is provided in the new cap by reason of its rounded edge and the downward projection which prevents the fingers from being pinched.

The tie-spacing shoe is a drop forging. It can be adjusted so as to give two positions of the toe. When adjusted in either position it does not swing away from the jack, nor can it drop out.

To use the new attachment for spacing ties, the ballast is removed ahead of the first tie and the jack and toe are placed in position. After the first tie has been spaced the others can be pushed ahead without removing additional ballast.

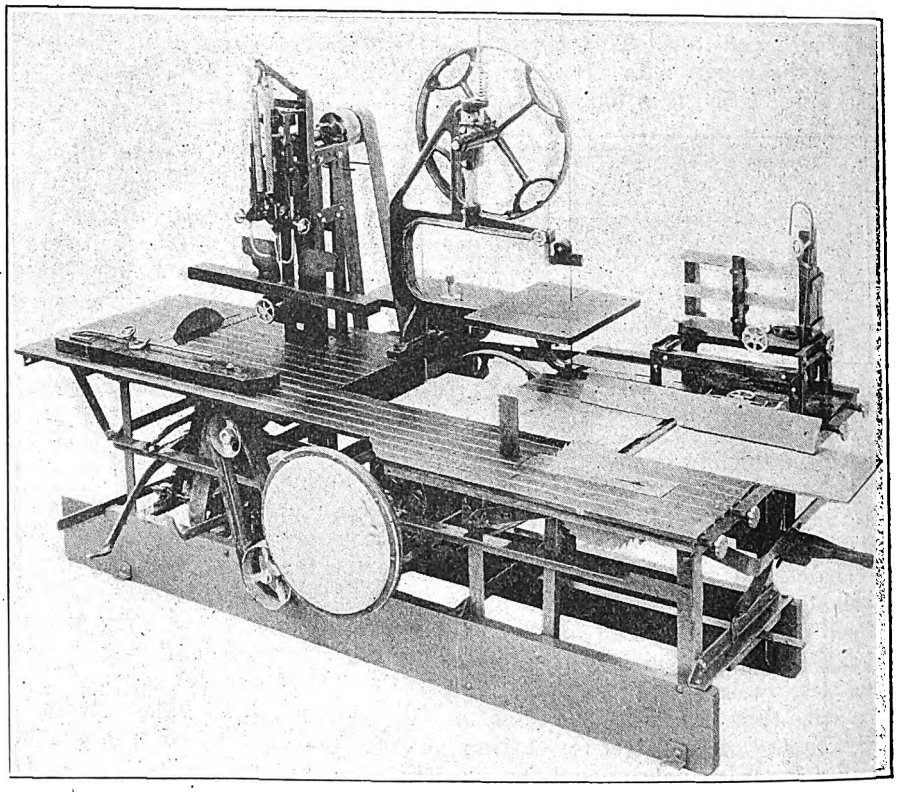
Combination Woodworking Machine

A COMBINATION working machine manufactured by the Parks Ball Bearing Machine Company, Cincinnati, Ohio, is designed to provide practically all of the more important wood-working machine tools in one piece of equipment at a very low price. The machine is built up on a steel frame made of 2-in. angles and is supported on two base timbers of 2-in. x 10-in. material, 8 ft. long and set 2 ft. apart. The circular saw table has a double working surface made up of channel slats welded to the angle frame. This table is 3 ft. 8 in. wide and 3 ft. long. The distance between saws is 28 in. A positive and accurate adjustment of the depth of cut is provided by the mandrel control device. These mandrels will take saws with a 1-in. hole and are stopped and started with a friction clutch.

A 12-in. wide joiner is provided, with a round safety head and four knives. The cutting circle is 4½ in. diameter. The steel plates are raised or lowered on an incline with hand wheel screws to adjust the depth of cut. A tilting guide on the joiner tilts to an angle of 45 deg. and is adjustable up to 17 in. width. A spring holds down the material.

At one side of the frame a band saw is mounted, which cuts to the center of a 44-in. circle. The band saw table measures 14½ in. x 17½ in. and can be tilted for sawing bevels. The wheels take saws 12 ft. long and the upper guide can be raised to take material up to 7 in. thickness. A belt-shifting device is used for convenience of the operator in stopping and starting.

There is a swing cut-off saw, which will cut 1-in. material 15 in. wide, or 3-in. material 12 in. wide. It has an adjustable stop, so as not to swing back further than is desired for the particular width of the work. When not in use the saw drops below the table surface.



This Machine Has Ten Wood-Working Tools Combined in a Single Mounting

Other tools on the machine include a reversible spindle shaper, an upright hollow chisel mortiser and borer, a tenoner, an 18-in. sand disk, a rip guide adjustable for any width up to 22 in. and a cross-cut guide which slides in milled grooves in the table.

The combination of tools included in the machine would answer the requirements of a small electric railway, where the investment in a more expensive installation of individual machines is not warranted by the amount of millwork to be done, or where limited shop space does not allow a more complete installation.

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The News of the Industry

New Plan for Cleveland

Steam Railroad and Electric Railway Officials Discuss Terminal Problem and Suburban Co-ordination

Plans for handling and co-ordinating transportation in the metropolitan area of Cleveland, including its large suburbs, are now being worked out in a series of meetings between the officials of the Cleveland Railway and O. P. and M. J. Van Sweringen, Cleveland, who are building Cleveland's new union terminal station, to be completed about 1928. All of the Van Sweringen plans for rapid transit from the Cleveland suburbs call for electrification.

Details of the working out of the transportation plans of the Van Sweringens with the Cleveland Railway have not as yet been made public, but in a statement to the Metropolitan Transportation Commission Mr. Van Sweringen said he felt that his companies would furnish the Cleveland suburbs with their rapid transit facilities, while the Cleveland Railway should have a monopoly over the bus and traction service within the city proper, which means a radius of 5 to 7 miles from the Public Square.

This may eventually mean that some of the Cleveland Railway suburban lines may come into the hands of the Van Sweringens and that there may be an interchange of transfers between the Van Sweringen rapid transit lines, which will lead into Cleveland's new union station, and the Cleveland Railway's city lines.

It is also possible that the Van Sweringens may arrange with the Cleveland Railway to build a downtown subway terminal underneath the Public Square, with approaches to the new union station.

When the Van Sweringens and the Cleveland Railway officials have completed their discussions in executive sessions it is expected that the metropolitan area of Cleveland will have one of the finest co-ordinated transportation systems in the country.

Bus Permit Denied—Iowa Interurban Would Be Impaired

A request for a permit to operate a bus line from Davenport, Iowa, to Clinton, Iowa, and from Davenport to Muscatine, Iowa, has been denied the Scenic Stage Line Company of St. Paul by the Iowa Railroad Commission. The proposed bus line would have paralleled the route of the Clinton, Davenport & Muscatine Railway, an electric line operated by the United Light & Power Company. It was brought out at a hearing conducted at Muscatine that the proposed bus line would touch at nearly all of the towns along the interurban line in addition to serving the three terminals. The bus line would have served three points which the interurban does not serve. The three towns are served by three steam trains each way daily and the towns on the interurban, 21 in number, are served by eleven trains each way daily. Some little time past the interurban railway company put in effect a new and faster schedule, increased the number of trains and has been advertising for business.

The commission held that as the Clinton, Davenport & Muscatine Railway was dependent on business from the towns along its line alone and did not traverse other states so that it could make up a loss in business elsewhere a competing bus line would probably destroy a large property investment now adequately serving the public; that it would not promote the public convenience, but would more likely inconvenience a greater number of people by impairing rail line service now provided for.

$500,000,000 Traction Vote in Chicago

Co-ordination Measure Goes Before Voters on April 7—Exciting Campaign—Ex-Mayors Oppose New Plan

CHICAGO, noted for two defeats of transportation proposals at the polls in the last twelve years, votes on April 7 on the Dever-Schwartz $500,000,000 subway co-ordination measure. The finishing touches have been put to a remarkable campaign in which 150 meetings were held in the last week alone.

The economic aspects are unusual in that the city expects to acquire the Chicago Surface Lines for $163,000,000, the elevated for about $85,000,000 and build a subway without any direct outlay on its part. The whole financing except $40,000,000 paid to the city by the Surface Lines is expected to be done out of earnings. The ordinance calls for the outlay of $702,000,000 for the physical plant over a 20-year period, all to be paid for by notes.

Three Ex-Mayors Pictured by Chicago "Tribune" as Blocking the Track

Possibility of a 27-mile ride for 6 cents after the co-ordination has operated a year is held out by the campaigners. At its inception the fare will be 7 cents for elevated and surface lines (subways later) with interchangeable transfers. Col. Bion J. Arnold, Major R. F. Kelker, Jr., and Robert Isham Randolph, widely known consulting engineers, support the fare reduction promise through the Non-Partisan Committee of One Thousand, which directed Mayor Dever's campaigning.

The ordinance provides a $5,000,000 stabilizing fund. When this passes $7,000,000 the fare comes down 1 cent. The experts explain that if the courts uphold the contention that this is a municipal property and tax exempt, $4,400,000 will be immediately available. This is the sum which the elevated and surface lines would have to pay in taxes. Besides, there will be an end to the burden of paying 55 per cent of net operating income into the city treasury, which the surface lines have done for eighteen years.

An early issue as to whether this was to be a privately owned or municipally owned system grew cold as the vote neared. Private investors will hold a mortgage on more than half the lines for twenty years. At that time the city will be conceded more than half ownership and will assume majority control of the operating board which will run the lines. The city will never have less than an equal voice in naming the operating board.

An anomoly has been presented by the campaigners in the declaration that the surface lines are the finest transportation plant in the country and rendering excellent service—of course with limitations. Far from the cry of inefficiency usually heard in campaigns, the city speakers have pointed out that it is physically impossible, without subways, to better downtown transportation on account of congestion.

Buses have come in for a share of the debate, but proponents of a complete bus system have made little headway. Their arguments were answered by pictures of long lines of buses, automobiles and street cars wedged for blocks

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in the shopping district. Buses, the campaigners said, will be used for feeders to rapid transit lines in neighborhoods not populous enough to support surface cars.

Underground campaigning has been explosive. Chicago's three ex-Mayors, William Hale Thompson, Carter H. Harrison and former Governor Dunne, came out against the ordinance. Supporting Thompson, Governor Small ordered the Illinois Commerce Commission to investigate, and supposedly condemn, the plan and was defied by the chairman, Frank L. Smith. The Thompson "transportation district," which was beaten at the polls five years ago, was revamped into a bill for the Legislature. None of the opposition moves seemed to stick.

Dunne declared his belief that the operating board has already been agreed on in the city hall and doubts whether nine men can be found who will run the lines honestly and without politics. He charges that once a man is in one of the positions, which may pay as high as $50,000 a year salary, he will be unassailable. There is no removal provision in the ordinance.

Carter Harrison declared its insufficiency condemned the subway plan. He said he would stand for nothing less than subways to every district. Under his plan there would be little surface transportation.

Hearst newspapers are working with Thompson. They claimed to have brokers' literature promising $240 gain in the market price of surface lines bonds and $37 gain for every share of stock, which is headlined: "Rich melon promised if Dever wins," and a keyline "Who Pays? Poor old city."

Thompson, ordering his own political machine solidly to the polls to vote no, has appealed to other citizens to stay away from the polls so they would not make the mistake of helping to pass the ordinance.

It has been generally conceded that the ordinance will be adopted, although it is a by-election. A poll, however, showed the sentiment to be very close. Support of 303 civic bodies is claimed for the ordinance with 25 against it.

Will Report on New York City's Suburban Problems

Governor Smith signed the Mastick bill on April 2 which creates a commission of eleven members to investigate and report upon the suburban transportation problem of the city of New York and its environs.

Buffalo Conference Postponed

The Public Service Commission has adjourned until April 15 the conference to be attended by the members of the commission, the municipal authorities and officials of the International Railway, Buffalo, including Thomas E. Mitten of Philadelphia. At this conference the report of the engineers of the commission detailed to check up on local service and equipment conditions will be ready and the co-operation of municipal authorities and the railway management will be asked by the commission as the most effective means of ending the traction problems of Buffalo.

New Fare in Youngstown

Weekly Ticket Plan Started as Means of Inducing Off-Peak Riding —Token Holders Sold

The Youngstown Municipal Railway Youngstown, Ohio, contemplates building up off-peak riding by the sale of a weekly ticket good for 25 rides to sell at $1.25, making the individual rides 5 cents each, and in this way restoring in a measure the 5-cent fare. This innovation will in no way affect the existing rates of fare. They are 8 cents cash or seven tickets for 50 cents, with a 1-cent charge for transfer on either cash or ticket fare.

Appeal to Youngstown Riders to Use Token Holders

Each ticket will contain 25 spaces for the conductor or operator to punch out the rides as taken. The ticket will be presented by the passenger for this punching for each ride taken. Between the hours of 5 a.m. and 7 p.m. weekdays the weekly ticket is good for only one person. Between 7 p.m. and 5 a.m. weekdays and all day Sundays and legal holidays it is good for any number of persons, one ride being punched out for each of the group using the ticket in common.

No transfers will be issued on fares paid by use of this ticket.

The ticket will be good for a specified week only, starting at 12 a.m. Monday and continuing through till 12 midnight the following Sunday. This week will be designated on the face of each pass by the dates, the first week, for instance, being good from April 6 to April 12, 1925, inclusive.

The arguments in favor of the use of this form of transportation are that it will encourage short riding at the reduced rate, will increase the noonday riding, in a number of instances probably a number of persons going to and from home for lunch, and thus taking four rides a day at a total cost of 20 cents instead of two rides at a cost of 14 to 16 cents, and increasing the use of cars and buses in the evening by having family parties or other groups use the cars with weekly tickets rather than the automobiles for pleasure riding. An increase in use of the cars Sundays and holidays is also anticipated.

The introduction of this form of ticket is experimental. Whether it will be continued depends upon the results obtained after a sufficiently long trial period.

Furthermore the Youngstown Municipal Railway began the use of metal tickets in lieu of the paper strip tickets on Sunday, March 29. Apparently the change in form of tickets was most successful. More than 70,000 tokens were sold on the first day and a supply of 10,000 token carriers given free with purchase of these tickets was exhausted long before the day was finished. As a result the company has ordered more of these carriers.

Out to Win in Dallas

To win the Charles A. Coffin Foundation award in 1925 is the hope of the Dallas Railway, Dallas, Tex., and the ambition of its patrons and employees. The company is urging the co-operation of all in its effort to increase its employees' benefit fund by $1,000 to win the gold medal and to put Dallas in the forefront as the most progressive city in the United States. Every day, "in the interest of a greater Dallas by the Dallas Railway," the company is publishing *Trolley-grams*, a news sheet containing some interesting history on the company as well as some stories of a lighter vein for the amusement of the car riders. The Coffin award, established three years ago by the General Electric Company as a memorial to its late president, is made to the electric railway which during the year makes the greatest contribution toward increasing the advantages of electric transportation for the benefit of the public and the industry. The Northern Texas Traction Company, Fort Worth, won the award in 1924.

Draft of Railway-Bus System for Toledo Awaited

In answer to the demand of the city for better service and some move toward a reduction of street railway fares the Community Traction Company, Toledo, Ohio, plans to submit to the City Council in about three weeks a tentative draft of a combined street railway and bus system to serve the entire city. Along with the plan will be provision for securing the necessary additional capital to take care of approximately $900,000 of new track and street work and purchase new bus and garage equipment.

Officials of the company now are working on plans for complete rerouting and abandonment of some lines. Parts of existing lines will be given up and new all-bus routes established and in other parts of the city the bus feeder system will be enlarged. A condition of this plan for betterment of service and extensions of lines will be a monopoly of the street transportation. This is possible now because the City Council has complete authority over the establishment of city bus lines through the recently enacted Collister-Krueger act. It is almost certain that a crosstown bus line will be a feature of the new system. Company officials take the attitude that the fare problem is not the paramount issue now, but that

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citizens want the best service. It is pointed out that most of the responsible bus system offers which have been received by the company contemplate a 10-cent fare.

A corps of engineers from Henry L. Doherty & Company, headed by R. F. Carbutt, arrived in Toledo on March 31 to go over the plans and make estimates of needed capital and possible revenue over a period of five years. Their findings will be submitted to the New York office of the Doherty interests and then the final plan will be presented to the City Council of Toledo.

The new plan is to be presented with the idea of not modifying the Milner service-at-cost ordinance. However, it is believed that the board of control, City Council and other city authorities believe that some changes will have to be made in the ordinance to make it more effective and more responsive to conditions that have changed since it was adopted. Easier sinking fund charges may be asked.

Financing of Bus Purchases Arranged at Cleveland

The City Council of Cleveland, Ohio, on March 30 approved an unusual method of raising $2,000,000 for the purpose of improving Cleveland's transportation system by the purchase of buses and the making of rail extensions.

The $2,000,000 of new capital is to be raised by taking $33,333.33 a month out of the street car revenues, starting April 1, for a period of two years, thus accumulating $800,000. This money ordinarily would go to the interest fund and tend to reduce the rate of fare. The balance of the $2,000,000, namely, $1,200,000, is to be also set aside out of the company's income by trimming down its regular allowances for maintenance, depreciation and renewal.

With this $2,000,000 buses are to be purchased, rail lines extended and a new carhouse built.

The buses are to be purchased at once and to be ready for service in June over fourteen routes already mapped out by the company.

There will be double-deck buses on two main thoroughfares, one running east and the other west from the Public Square.

More Five-Cent Zones on New Jersey Railway

The Public Service Railway, Newark, N. J., has filed with the State Board of Public Utility Commissioners a tariff which abolishes the 8-cent unit fare on all its lines in Bergen County and substitutes a 5-cent fare. The new tariff applies to the company's Bergen Division the fare plan originally recommended by the State Board of Public Utility Commissioners and now in effect throughout the greater part of its system.

The change will reduce the length of the zones at the same time it reduces the fare in each zone. Under the present tariff there are on the lines in question thirteen 8-cent and six 5-cent zones, a total of nineteen. Under the new tariff there will be a total of 26 5-cent zones. The through fare, terminal to terminal, on the Englewood line will be reduced from 24 to 20 cents; on the Palisade line from 18 to 15 cents; on the Bergen Pike line from 26 to 20 cents. Through fares on the Hudson River and Hackensack lines are increased by 1 cent, the new fare being 30 cents, as compared with a present 29 cents; on the Fort Lee 2 cents—from 8 to 10 cents.

Long Island Work Ready

Electrification to Jamaica to Start with Summer Schedule—100 Cars Almost Ready

The work of electrifying the Montauk Division of the Long Island Railroad as far as Babylon is more than 80 per cent completed. With the exception of a short stretch at Babylon, where track changes are about to be made, the third rail has been installed on both tracks from Laurelton to Babylon. The work west of Laurelton is progressing rapidly. It is more than 20 route-miles from Jamaica to Babylon.

When the summer schedule of the Long Island Railroad, now in course of preparation, goes into effect on May 21, all steam passenger service will be removed from the Montauk Division between Babylon and Jamaica. This means that more than 80 local trains will be operated by electricity.

Sixty steel passenger cars now used in steam service will be equipped for electric operation, and 40 new motor cars are being constructed for service on the new electrified line to Babylon.

From Laurelton substation to Lindenhurst, the third rails have been alive for construction purposes. Current is being taken from the third rail for use in installing bonds at the joints in the running rails. This bonding work has been completed between Laurelton and a point just west of Lindenhurst.

The track circuits and relays of the automatic signals have been changed from direct to alternating current between Valley Stream and a point east of Lindenhurst, to permit the use of the track rails for the return circuit of the train propulsion system, as well as for the operation of the automatic signals.

Construction work on the substation buildings at Laurelton, Freeport, Wantagh, Amityville and Babylon has been completed. Similar work on the substation at Lynbrook is nearly finished. The installation of electrical equipment in the substations at Laurelton, Lynbrook, Wantagh and Babylon is well advanced; at Freeport installation work has commenced, and will also be undertaken shortly at Amityville.

Aside from a short gap at each substation, the transmission line has been completed, including poles and wires, from Lynbrook to Belmont Junction, west of Babylon.

The work of rehabilitating the existing transmission line between Rockaway Junction and Valley Stream is about 90 per cent completed.

9,000 Words Reduced to Cartoon

Artist of St. Louis "Times" Used Pencil to Reflect Recent "Electric Railway Journal" Article

Valuation of Cincinnati Properties Recommended

The report of the traction committee of the Cincinnati, Ohio, Chamber of Commerce on the 25-year traction ordinance now before the City Council has been accepted by the board of directors of the chamber. In accepting the report, which is based on the findings of Dr. Milo Maltbie, New York, public utilities expert, engaged by the chamber as consultant, the directors of the Chamber of Commerce definitely opposed the new ordinance drafted several months ago by representatives of the city administration and the Cincinnati Traction and the Cincinnati Street Railway.

According to its findings the committee is of the opinion that the proposed ordinance favors the traction interests unduly and at the expense of both the city and the car rider. With this report as a basis the Chamber of Commerce will suggest to the City Council that representatives of interested parties be called together for the purpose of drafting an entirely new ordinance. This new ordinance, it is indicated, should adjust more equitably the points raised in the chamber report.

Among the recommendations incorporated in the report is that of a valuation of the traction companies. Such a valuation is the basic and controlling factor for the settlement of all points at issue, particularly capitalization, it indicates. Other equally important recommendations are the strengthening of the city's control of the electric railways, a limitation of powers of arbitrating orders of the director of street railways, narrowing the field of court appeals, increasing the company's responsibilities with regard to street paving the maintenance, a more adequate control by the city over the management of reserves and other funds, elimination of provisions which in reality will necessitate a renewal of the ordinance in ten years, provision that the city may construct or provide other plants or equipment and elimination of the clause which might prevent the city from operating other transportations. In discussing the question of fares the report says that this issue is dependent upon the question of valuation.

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Additional Bus Rights Sought in Bridgeport

Representatives of the City Service Corporation, backed by Walter B. Lashar and others, testified at a hearing held in Bridgeport, Conn., on March 28 before the Public Service Commission in regard to two applications for bus routes over which it seeks permission to operate. Counsel for Mr. Lashar was quite frank about the matter. He is reported by the Bridgeport *Telegram* to have said:

> We are ready to concede that the passenger transportation business in Bridgeport is a natural monopoly and will retire gracefully when the traction company deserves such a monopoly. We are out to force the Connecticut Company to adopt the 5-cent fare in Bridgeport.

Mr. Lashar, who is head of the American Chain Company, hopes to "bring the trustees of the Connecticut Company out of winter quarters to look Bridgeport over" and not to say again that "Lashar is crazy."

The new company is seeking the right to operate over two routes. Not only the Connecticut Company but the Bridgeport Auto Transit Corporation interposed objections to the granting of rights to the new company on the ground that its operation would mean needless duplication of facilities. The Connecticut Company representatives indicated their willingness to increase their facilities to meet the city's needs.

The commission reserved decision on all of the applications.

Incidentally Mr. Lashar has indicated that with the completion of the new Lordship highway from Hollister Avenue to the shore manor the present scheme of operating a trolley system to Lordship will be abandoned and buses substituted. The Lordship Railway is a 4-mile line. Mr. Lashar is understood to be its owner.

Kansas City Bus Ordinance Still Deadlocked

The March 30 meeting of the City Council of Kansas City, Mo., failed to break the deadlock in the lower house over certain issues regarding the ordinance which was drafted and introduced to the City Council for the purpose of granting the Kansas City Railways a three-year franchise for the operation of an auxiliary bus service upon the city's streets. Two weeks ago, when the bill came up for consideration in the lower house, one of the Democratic Aldermen proposed an amendment which would reduce the term of the franchise from three years, upon which the railway's receivers and the Council committee had previously agreed, to a period terminating six months after the end of the present receivership. Upon receipt of the bill, as amended, the bus committee reconsidered, but returned the bill to the lower house in its original state.

Rumors were current on March 30 to the effect that the Democratic faction would propose to amend again the bill so as to terminate the franchise one year after the close of the railway receivership. However, when the bill came up the Democratic bloc carried the vote to refer it once more to the special bus committee. The vote was 8 to 7 in favor of returning the bill, the seven Republican Aldermen being in favor of decisive action.

Another hearing on the bill is expected to be held by the special bus committee at a meeting April 3.

It seems doubtful whether the bloc in the lower house can be broken, and if it cannot and the bill is amended, there is said to be much skepticism in regard to possible approval of Judge Kimbrough Stone, referee in bankruptcy, since the receivership is expected to terminate at the end of this year. It is thought that Judge Stone will consider the time limit too short for the required investment.

Sliding Fare Scale Suggested for Atlanta

The special traction committee of the City Council will recommend a sliding fare for Atlanta, Ga., it was learned on March 30. This is in accordance with the Beeler plan and the request of the Georgia Railway & Power Company for a revision of its contract with the city. The contract to be recommended is understood to include the following provisions:

> That the initial fare be 10 cents, four tickets for a quarter, a 5-cent fare for children and free transfers.
>
> That the company establish a barometric fund of $250,000. Should earnings sink to a point where it was necessary to use this fund, and drop, say, below $50,000, a second scale of fares would go into effect. Under this scale, fares would be 10 cents, no tickets, a 5-cent rate for children, and free transfers. Still further adjustments are provided.

The valuation of the railway will be fixed by the committee at $16,500,000, with 8 per cent declared a fair return. Should rates under the first fare scale fail to give this 8 per cent return, then the barometric fund would be used until it fell below the $50,000 mark, when the second scale would become effective.

The committee, it is understood, will refuse to strike out the tax on gross receipts, but may recommend the payment of a lump sum in its place. The committee may also set a lump sum of $100,000 a year for street repair work.

Sweeping changes in the routing of cars are also in prospect.

With the consent of the city, the company anticipates no difficulty in securing the permission of the Public Service Commission to adopt a sliding scale of fares.

Phoenix Controversy Unchanged

The case brought by the city of Phoenix, Ariz., to revoke the franchise of the Phoenix Railway is still in the Superior Court, having been transferred from the United States District Court. It is likely that the hearing will not take place until next fall. It was charged by the city that the company had failed to live up to the conditions of its franchise, particularly with respect to carrying out paving work. In the meantime the Yellow Taxicab has applied for a permit to operate on one of the principal thoroughfares. At a recent hearing before the Arizona Corporation Commission on this matter the Phoenix Railway was not represented as an opponent, but many citizens on their own initiative opposed the granting of the permit. No decision has as yet been rendered.

Summary of Recent Bus News

The decisions of the United States Supreme Court in the Buck and Bush cases are expected in Washington to bring about regulation of highway transport by the Interstate Commerce Commission. Those decisions also are thought to imply a new obligation of the federal government in the matter of road construction. The states, of course, still are in a position to prescribe regulations for the use of roads which could be made so onerous as to discourage bus operations, but it is believed that the state public service commissions will enter into the spirit of the decision and prescribe reasonable regulations. The decisions are also regarded as furnishing another high obstacle in the path of those who contend that the federal government has no constitutional authority to participate in road building.

Installation of bus service in the city of Oswego, N. Y., with an estimated outlay of $75,000, is planned by the Empire State Railroad Corporation. Operation over four routes with at least six buses is planned. The only obstacle appears to be a decision as to the fare to be charged. The Council demands that the fare be put at 5 cents. T. C. Cherry, vice-president of the corporation, contends that it is impossible to operate buses at that fare. He has asked that the city run the buses for six months as an experiment to prove his contention.

Governor Fuller of Massachusetts has signed the bill, enacted this year by the Legislature, authorizing the railroads to carry freight and passengers by motor vehicles, when the Public Utilities Department certifies that such service is in conformity with public convenience and necessity. This bill was offered in the Legislature by former Representative James B. Brown, legislative counsel for the Boston & Maine Railroad. This law will have a far-reaching effect upon the present contest with the railroad, motor truck and bus line companies.

In Connecticut the usual procedure of attempting to give electric railways the right to operate buses directly has been reversed. In order to clear up a controversy in which the trolley interests claimed the right to establish bus lines anywhere a bill provides that such companies must get permission from the Public Utilities Commission, just as an independent company would. A bill allowing electric railways to substitute buses for street cars without sacrificing the franchise has also been introduced.

Mayor Van Zandt has signed an ordinance authorizing the Rochester Railways Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways, to operate a bus line in the Ridge Road from the city line to Waggs' Corners, where it will connect with city trolley lines. The action of the Mayor is significant in that it indicates the policy of the city to vest transportation in the city exclusively in the railway, with which it has a service-at-cost contract. The company now has only to obtain the permission of the State Public Service Commission.

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News Notes

Federal Court Will Decide Income Tax Question. — Suit to determine whether Seattle public employees in utility service are legally liable to income tax will be pressed through the federal courts to the Supreme Court, if necessary to secure a final adjudication of the question. This is in accordance with approval by the City Council finance committee of an ordinance giving Corporation Counsel T. J. L. Kennedy permission to prosecute such a case. Under an order from the internal revenue department, street railway employees have already paid income tax, and the proposed suit will take the form of an attempt by one of the employees to recover the amount of the tax so paid.

Commission Approves Milwaukee Contract. — The Wisconsin Railroad Commission has approved the proposed service-at-cost contract between the city of Milwaukee and the Milwaukee Electric Railway & Light Company, leaving only the vote of the people to decide whether the city should accept the agreement. The commission declared that the value of the company's properties as fixed in the contract was both reasonable and just, as was the method provided for ascertaining the value in the future. Referring to the rate of return fixed in the contract, the commission found that the rate allowed was reasonable and would serve as a satisfactory basis for adjustment of utility rates.

Magnanimous Action of Employees. —Following a recent meeting of 250 employees of the Cass Avenue division of the United Railways, St. Louis, Mo., when a prize of $200 was awarded the workers for having the best accident record during February, A. O. Kelly, a motorman, arose and moved that the money be sent to the tornado sufferers of southern Illinois. The motion was adopted unanimously and the prize money was immediately wired to Murphysboro, Ill., to swell the relief funds being raised for the victims of the storm.

"Ride the Street Cars for Safety."— In a recent newspaper advertisement the East St. Louis & Suburban Railway, East St. Louis, Ill., says that "ride the street cars for safety" is more than a slogan—it is a definitely proved fact. In proof of its statement it gives a little of the history of its own company with respect to fatalities. Since Jan. 1, 1917, when the present method of keeping records was installed, the East Side Electric Railway carried on all divisions more than 276,000,000 passengers and operated more than 44,000,000 car-miles, all without a single fatality to a riding passenger. "Think it over," says the ad, "not a single fatality over the whole system in more than eight years." The company states that statistics show that riding on street cars is safer than walking. Further, that riding on street cars is safer than any other form of urban transportation.

Higher Fare Sought.—With operating expenses exceeding revenues on its Kenosha-Waukegan motor coach line, the Chicago, North Shore & Milwaukee Railroad has been forced to apply to the Illinois Commerce Commission for permission to increase fares between these two points to 3.6 cents for tickets and 4 cents a mile cash fare. The rate of fare which has been in effect since the installation of the service in December, 1923, has been 3 cents a mile when tickets are purchased or 3.3 cents a mile when cash fares are paid.

Considers Seven-Cent Fare Request. —After hearing argument by the counsel of the Virginia Railway & Power Company and attorneys representing the city of Richmond, Va., the State Corporation Commission recently took under advisement the request of the company for a 7-cent fare. The present fare charged by the company on all of its railway lines in the city of Richmond is 6 cents.

Mayor Wants Municipal Ownership. —Mayor J. Herman Hallstrom, Rockford, Ill., has publicly gone on record as favoring municipal ownership of Rockford's traction system. The Mayor is opposed to the present traction company and has indicated that any other company which might obtain a franchise was only a means to an end in his plan for a municipally owned system.

Reduced Fare Books Authorized.— The Oklahoma Corporation Commission recently granted the application of the Shawnee-Tecumseh Traction Company for permission to sell books containing 20 tickets for $4 to cover fare on interurbans from Shawnee to Tecumseh. The books may be used by the purchaser or any member of his immediate family. The application was accompanied by resolutions adopted by the citizens of Shawnee and Tecumseh consenting to the change.

New Negotiations Expected. — The Supreme Court of Ohio has decided against the city of Toledo in its fight on behalf of a lower power rate and for the return of $200,000 of excess power charges. These charges were collected from the Community Traction Company by the Toledo Edison Company over a period of two years or more when no power contract between the two companies had been approved by the street railway commission. This action now clears the way for new negotiations between the commissioner and officials of the Toledo Edison. The courts held all the way through that the Public Utilities Commission, by terms of the ordinance, had jurisdiction over the power rate. Action is also pending before the utilities body. The court battle was started under Commissioner W. E. Cann.

Operators Take Cash Fares. — The United Traction Company, operating in Albany, N. Y., and vicinity, recently eliminated the fare collection boxes and passengers now hand cash fares directly to the operator of the car, who rings them up. Cars have been equipped with facilities for recording fares so received. This marks a departure in the operation of one-man cars in this section. It is expected the new system will expedite the movement of cars.

Foreign News

Operation of One-Man Express Bus in Paris Successful

Express bus service inaugurated in September by the Société des Transports en Commun de la Région Parisienne on the Passy-Bourse line is proving very satisfactory. A 15-minute reduction in the running time has been made by these new express buses.

The new vehicles are similar to those recently placed in service in Calais, Anvers, Rotterdam and The Hague. A four-cylinder motor with a speed of 1,500 r.p.m. is mounted on a 3-ton chassis. Seats are provided for 25 passengers. Entrance and exit facilities are provided at the right hand side at the front, similar to the arrangement ordinarily found on one-man buses in the United States.

Instead of a door, however, a low wire gate is used. Its operation is interlocked with that of folding steps. Opening and closing of the gate is controlled by a lever placed at the left of the operator. To permit quick opening by a passenger in case of emergency, a foot pedal has been placed in front of the entrance. This pedal is painted red and instructions concerning its use are posted in the vehicle. A second emergency exit has been arranged at the rear of the bus.

Metropolitan Railway Electrification

Operation of electric trains on the Metropolitan Railway, London, England, between Harrow and Richmansworth began on Jan. 5. This extension involves approximately 23 miles of single track, on which the 600-volt third-rail system is used. Automatic signals were also installed. At present half-hourly service will be rendered. The area served is a growing residential district and the introduction of electric service is expected to hasten the development of this section.

A short branch line to Watford is now being electrified. When this work is completed there will be two electric railways operating from London to Watford, the other being an extension of the Baker Street & Waterloo Railway. The line from the Baker Street terminal, London, to Harrow was electrified several years ago.

London Tubes to Have Additional Escalators.—Contracts of the value of £107,000 have been placed by the City & South London Railway with Waygood-Otis, Ltd., for the construction of escalators at the six underground stations on the Morden extension, now under construction. These moving stairs will be of the cleat comb type, found satisfactory in the installation at Clapham Common station.

One Tramway in Paraguay.—Paraguay has only one tramway, which is in Asuncion, and 17 miles of this line is operated by electricity, 7 miles by steam and 2 miles by animal power.

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Financial and Corporate

2,000 Winnipeg Shares Sold in Five Days

New stockholders to the number of 1,280 were added by the Winnipeg Electric Company, Winnipeg, Man., at the close of its recent customer-ownership campaign. The sale of 2,000 shares of preferred stock met with instant success. Although advertised as a ten-day sale, the whole allotment had been sold before the end of the fifth day. The campaign was continued throughout the ten days, ended March 11; however, in order not to disappoint many Winnipeg people who desired to become owners of the company's securities, 2,845 shares, in all, were sold.

The actual selling of the stock was conducted by employees of the company—motormen, conductors, linemen, clerks, meter readers, stenographers, etc. Their efforts were supplemented by a well-planned advertising campaign, by means of which every householder was reached.

The work of the company in the matter of organizing the stock-selling campaign has been very favorably commented upon. At the outset A. W. McLimont, vice-president, appointed a committee consisting of L. Palk, M. F. Wardhaugh and H. C. Howard, publicity agent, to direct the sale and effect the organization necessary. Meetings of employees were addressed by members of the committee and instructions on "How to Sell" were given. Each employee turned in to the committee the names of ten prospects likely to purchase stock, to whom specially prepared literature was sent prior to the time the employees called.

It was the policy of the company to sell not more than five shares to any one customer. Rigid observance of this rule resulted in wide distribution of the stock. Among the new stockholders are men and women in all walks of life, located in all sections of the community. It is estimated that as a result of this campaign the number of preferred stockholders was doubled.

The stock which was sold was part of an issue of preferred stock made a number of years ago and was acquired from large holders for customer-ownership campaign purposes.

Railway Bus Operation Analyzed

Twenty-three cents per mile is the average cost of operating 25-passenger capacity buses during 1924 by 38 electric railways, either directly or through subsidiary companies. So says E. J. Murphy, chief statistician of the American Electric Railway Association, in an analysis of reports contributed by him to April *Aera*.

These 38 companies operated 14,358,084 bus-miles and had in daily operation 328 buses out of a total of 497 owned, with a seating capacity of 12,050, or an average of 24.54 per bus.

Information obtained from 45 companies owning 564 buses indicates a revenue of $3,491,800 for the year, 44 of which, operating 806.5 miles of route, report 15,972,552 bus-miles. The number of passengers carried as reported by 43 companies was 47,852,899.

Complete reports were obtained from 38 companies for the full calendar year, but sixteen companies reported a comparison of operations for two years. Taken as a whole the 38 companies failed to earn revenue sufficient even to meet operating expenses, not including taxes and fixed charges.

Revenue Passengers Total 38,049,947

The railway properties of the Columbia Gas & Electric Company during 1924 carried 38,049,947 revenue passengers and operated 3,948,561 car-miles. The Columbia system operates an electric railway serving several cities and towns in northern Kentucky, directly across the Ohio River from Cincinnati. Cars are operated on eighteen separate routes, crossing two bridges over the Licking River, which connect Newport with Covington, and over two Ohio River bridges, bringing the railway system into the modern Dixie Terminal in Cincinnati. The transportation system serves a total population of 120,000 people on the Kentucky side of the Ohio River.

$636,696 Loss at Boston

Wage Increases Have Adverse Effect on Company Under Public Control—Increase in Local Fares from Five Cents to Six Cents Not Harmful—Trustees Hope to Close June 30 Year Even

DURING the calendar year which closed with Dec. 31, 1924, gross receipts and number of revenue passengers carried were the largest in the experience of the Boston Elevated Railway, Boston, Mass., either under private management or public control. Owing, however, to increases in wages, the first under the Mayberry award and then later under the McLaughlin award, the operating labor cost of the past calendar year has mounted to $17,358,670, an increase of $1,134,394.55 over the operating labor cost of 1923. There was a loss of $636,696 for 1924, compared with a gain of $679,631 for 1923.

Immediately following the announcement of the decision in the last arbitration proceedings it was necessary to increase the 5-cent local fare, which had been established largely for the outlying district, to a basis of 6 cents. The trustees say that there has been no substantial diminution in traffic as a result of this increase, and feel that the additional revenue thereby secured will aid largely in meeting the increased costs.

During 1924 739,151 more revenue passengers were carried than in 1923. Passenger revenue mileage increased by 1,939,014, in large measure due to increased use of one-man cars, which permitted an increased service without corresponding increase in cost. The one-man car and bus-miles were 31.7 per cent of the total surface-miles operated. The number of revenue passengers increased on weekdays and Saturdays, but there was a decrease of traffic on Sundays and holidays. The operation of buses increased. The miles covered in 1922 were 63,937; in 1923, 465,382, and in 1924, 890,901.

The sixth fiscal year of public operation of the railway closed with June 30, 1924. As there was at that time no excess of receipts over expenditures for the preceding twelve months, no payments were made to the cities and towns which had contributed to the loan assessment to meet the deficit of the first year of public operation. The aggregate amount contributed by the municipalities in 1919 was $3,980,151. The excess of receipts over cost of service during the past years had been applied, first, to the restoration of the exhausted reserve fund, and after this was accomplished there was paid back to the cities and towns $517,196 in July, 1922, and $1,114,557 in July, 1923. The aggregate of these amounts was distributed among the cities and towns served by the railway and reduced to $2,348,397, the balance still due them.

The trustees explain that the summer and fall months were characterized

COMPARATIVE DIVISION OF RECEIPTS AND EXPENDITURES OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDED DEC. 31

	1924	1923	1922	1921	1920
Total receipts	$34,175,319	$34,096,813	$37,699,176	$33,277,025	$34,031,636
Operating expenses					
Wages	17,358,670	16,244,275	14,772,340	15,563,255	17,261,445
Material and other items	3,203,378	3,236,805	2,903,650	3,093,934	3,310,858
Injuries and damages	740,025	822,775	555,355	518,249	640,165
Depreciation	2,496,000	2,004,000	2,004,000	2,004,000	2,004,000
Fuel	1,424,058	1,842,396	1,853,111	1,663,617	2,597,652
Total operating expenses	$25,222,133	$24,130,253	$22,088,458	$22,843,056	$25,769,122
Taxes	1,623,995	1,688,139	1,587,168	1,546,758	1,142,987
Rent of leased roads (including dividend rental under chapter 159, Acts of 1918)	3,175,566	3,185,577	3,646,595	4,203,061	4,102,230
Subway and tunnel rents	2,125,593	2,026,936	2,008,414	1,963,737	1,790,432
Interest on bonds and notes	2,602,891	2,316,026	1,891,315	1,494,258	1,514,963
Miscellaneous items	61,835	70,247	65,016	54,707	59,067
Total cost of service	$34,812,016	$33,417,181	$31,286,987	$32,105,580	$34,378,803
Loss for year	$636,696				$347,167
Gain for year		$679,631	$1,412,189	$1,171,444	

Profit and loss adjustments not included in above.

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as usual by large expenditures in reconstruction work. While the summer traffic was affected as usual by vacation and holiday limitations, it was influenced to an unusual extent by automobile competition and a depression in certain lines of business with accompanying lack of employment and consequent loss in riding. From July 1 to Nov. 1 the excess of cost of service over receipts was $1,042,556, exclusive of charge for back pay and profit and loss adjustments, an aggregate considerably larger than during the same period of 1923, and the restoration to a surplus of receipts over cost of service was slow. This exhausted the reserve fund, but November showed a small excess of receipts over cost of service, and the receipts for December exceeded expenditures by $305,503. Since then a gratifying increase in receipts has taken place. The trustees feel there is reason to believe that with the closing of this fiscal year on June 30 it will be found that receipts have been equal to expenditures. To accomplish this result, in view of the increased rate of wages awarded last summer, the trustees have been compelled to lessen service and to decrease working hours and number of men employed.

Since the last annual report the matter of capital requirements and future control of this railway has been exhaustively considered by a recess committee of the general court, and the report of that body is now before a joint committee.

The trustees review the principal improvements to the property during the year. The need does not exist for noting all of them here. On April 21 the operation of surface cars in the East Boston tunnel was superseded by the operation of specially constructed steel rapid transit trains. This change materially decreased the running time, eliminated congestion at way stations and made possible a far larger use of the tunnel. Since Aug. 27 elevated train service has been extended daily from 12:30 to 1:15 a.m. for the convenience of night patrons. Block signals have been installed on curves in the Tremont Street subway. The new instruction school in Sullivan Square was completed and has been placed in service. A new alternating-current signal system for the entire Forest Hills section was placed in operation during October. The so-called Bartlett Street units of the Everett repair shops were completed and the personnel and equipment transferred from the Bartlett Street shops on March 1, 1924. The work of erecting at Forest Hills a new lobby building for the car service men, a large garage for buses and a suitable heating plant to provide for all of the buildings grouped at this location has been nearly completed.

Final plans for the extension of rapid transit service in the Dorchester district by utilization of the Shawmut branch of the New Haven Railroad have been worked out in conjunction with the Boston Transit Department. The lease of the premises has been executed, all legal formalities completed, the contract for the first section let and work of construction started. When finished this extension will provide for opera-

TRAFFIC STATISTICS OF THE BOSTON ELEVATED RAILWAY FOR YEAR ENDING DEC. 31

	1924	1923	1922	1921
Round trips operated	6,994,749	6,488,082	6,059,531	5,773,584
Passenger revenue	$33,419,172.22	$33,297,951.50	$31,834,022.77	$32,253,629.59
Passenger revenue per car-mile (cents)	59.69	61.61	62.94	64.89
Passenger revenue per car-hour	$5.67	$5.71	*	*
Passenger revenue mileage	55,988,679†	54,049,665†	50,575,088†	49,706,697
Passenger revenue car-hours	5,894,115	5,826,993	*	*
Revenue passengers carried	382,888,848	382,149,697	356,593,942	337,252,080
Revenue passengers carried per car-mile	6.838	7.070	7.051	6.785
Revenue passengers carried per car-hour	64.96	65.58	*	*

*Comparable statistics not available. †Including motor bus mileage.

STATEMENT OF SPECIAL TRUST FUND OF BOSTON ELEVATED RAILWAY DEC. 31, 1924

Principal of trust fund as established		$1,500,000
Accretions and accumulations to Dec. 31, 1924		620,899
Total special trust fund		$2,120,899
Income from June 10, 1922, to Dec. 31, 1924	$217,888	
Less amount paid on account of retirement of second preferred stock	162,513	$55,375
Investments		$2,108,291
Cash on deposit		$67,983

ALLOCATION OF RECEIPTS PER PASSENGER OF THE BOSTON ELEVATED RAILWAY IN 1924

	1924 Cents	1923 Cents
Labor	4.534	4.246
Interest on bonds and notes	0.680	0.606
Rent of subways and tunnels	0.555	0.530
Rent of leased roads	0.829	0.834
Coal	0.372	0.482
Depreciation	0.652	0.524
Damage	0.193	0.215
Material and other items	0.853	0.866
Taxes	0.424	0.442
Total	9.092	8.745
Average receipts per revenue passenger	8.926	8.923

COMPARATIVE PASSENGER STATISTICS OF THE BOSTON ELEVATED RAILWAY—REVENUE PASSENGERS CARRIED

Year	Week Day Average	Saturday Average	Sunday Average	Holiday Average	Total for Year
1924	1,109,861	1,216,132	630,755	727,191	382,888,848
1923	1,109,274	1,196,301	652,404	758,915	382,149,697
1922	1,030,303	1,144,320	617,148	691,890	356,593,942
1921	975,745	1,068,295	578,860	696,691	337,252,080
1920	960,737	1,072,319	591,063	703,634	335,526,561
1919	934,918	1,078,635	596,182	706,429	324,758,685
1918	985,384	1,147,809	658,902	775,634	348,664,700
1917	1,073,943	1,249,588	728,847	857,902	381,017,338
1916	1,050,038	1,218,749	718,804	832,962	373,577,908
1915	992,283	1,140,046	685,726	846,860	352,469,586

COMPARATIVE POWER STATION STATISTICS OF THE BOSTON ELEVATED RAILWAY

	1924	1923	1922	1921	1920	1919	1918
Tons of coal burned	240,493	260,032	273,441	215,870	258,087	287,670	281,677
Pounds of coal per kilowatt-hour (direct current on line)	2.068	2.264	2.553	2.174	2.353	2.835	2.772
Average price of coal per ton	$5.921	$7.085	$6.777	$7.71	$10.07	$5.91	$6.26
Net cost of power for car service per kilowatt-hour (cents)	1.093	1.227	1.414	1.172	1.921	1.307	1.58
Net cost of power per total revenue car-mile (cents)	4.833	5.468	6.153	4.815	8.538	5.439	4.668
Direct current annual output (kilowatts)	260,401,225	257,270,357	239,905,874	222,461,060	245,676,503	239,892,118	227,582,057
Direct current maximum hour output (kilowatts)	86,245	82,965	78,755	75,905	72,295	71,760	67,965

ALLOCATION OF ASSESSMENT ON CITIES AND TOWNS OF BOSTON ELEVATED DEFICIT, YEAR ENDED JUNE 30, 1919

History of the 1919 loan assessment on cities and towns (chapter 159, special acts of 1918)

Cities and Towns	Passengers	Per Cent	Amount	Distribution of July, 1922, Repayment	Distribution of July, 1923, Repayment	Balance Due
Boston	2,100,423	71.9330	$2,863,042.50	$372,034.92	$790,029.10	$1,700,978.48
Cambridge	283,475	9.7081	386,397.11	50,209.95	106,622.54	229,564.62
Somerville	122,583	4.1981	167,090.75	21,712.43	46,106.54	99,271.78
Brookline	74,553	2.5532	101,621.23	13,205.06	28,040.99	60,375.18
Medford	59,754	2.0464	81,449.82	10,583.91	22,475.56	48,390.35
Malden	55,838	1.9123	76,112.44	9,890.35	21,002.65	45,219.44
Everett	54,823	1.8775	74,727.35	9,710.36	20,619.69	44,397.30
Watertown	41,198	1.4109	56,155.96	7,297.12	15,496.14	33,362.70
Arlington	32,477	1.1122	44,267.25	5,752.26	12,215.36	26,299.63
Chelsea	29,659	1.0157	40,426.40	5,253.17	11,154.86	24,018.37
Newton	27,201	.9316	37,079.09	4,818.20	10,231.84	22,029.05
Belmont	18,746	.6420	25,552.57	3,320.40	7,051.43	15,180.74
Quincy (Commonwealth of Massachusetts)	15,569	.5332	21,222.17	2,757.69	18,464.48	.....
Stoneham (Commonwealth of Massachusetts)	3,674	.1258	5,007.03	650.63	4,356.40	.....
Commonwealth of Massachusetts.*	.....	.....	.....	.....	690.24	†690.24
Totals	2,919,973	100.00	$3,980,151.67	$517,196.45	$1,114,557.82	$2,348,397.40

Based on traffic counts made July 24, 25, 26, 27, 1919, in accordance with the provisions of section 14, chapter 159, special acts of 1918.

*From the July, 1923, repayment the Commonwealth of Massachusetts deducted $690.24 to reimburse itself for the difference between 126 days' interest at 4.28 per cent on $4,000,000 (note issued July 17, 1919, due Nov. 20, 1919) and $3,980,151.67, the amount paid to the Boston Elevated Railway $297.33

And interest from July 17, 1919, to July 19, 1923, on amount the state deducted to pay assessment of Quincy and Stoneham 392.91

Amount of expense to state to be assessed to towns and cities pro rata to their original contribution $690.24

†Credit.

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tion of the Cambridge-Dorchester tunnel trains as far as Ashmont, or 3¾ miles from the present terminus at Andrew Square, and the operation of high-speed trolley service on private right-of-way from Ashmont to Mattapan. During the twelve months 17.15 miles of track and special work have been rebuilt and 3.77 miles of track and special work repaired.

During the year eight East Boston tunnel cars were received in addition to the forty originally purchased and eighty-nine new cars of the one-man, two-men type.

In 1918 the number of cars held out of service for repairs was 18 per cent. During 1924 a satisfactory record of 6 per cent has been maintained. Whereas in 1918 50 per cent of the surface car mileage was operated with articulated and box cars, during the year 1924 only 7 per cent was so operated.

Operating expenses on account of accidents were lowered from $975,020 in 1923 to $914,043 in 1924. Accidents per million miles operated with one-man cars were reduced from 230 in 1923 to 205 in 1924. Accidents per million miles operated with two-men cars were reduced from 259 in 1923 to 249 in 1924.

Power costs were lower in 1924 than in 1923, due to plant improvements and to lower price of coal. The average number of pounds of coal consumed per kilowatt-hour direct current at the cars was 2.068, the lowest of any year in the history of the railway. The average cost of coal for power during the year was $5.921 per long ton. The number of tons of coal burned was reduced from 260,032 in 1923 to 240,493 in 1924, notwithstanding an increase in kilowatt-hour output. The maximum current output for any one hour was 86,245 kw., which was the greatest in the history of the railway. During the year 115,675 ft. of underground conduit was laid.

Revenue Well Maintained at Pittsburgh

First Report Since Receivership Reflects Good Results of Operation Under New Agreement with Municipalities—Plans for Bus Service Ahead—Intensive Merchandising Program

THE first annual report of the Pittsburgh Railways, Pittsburgh, Pa., since 1918 has just been presented. In 1918 the railway passed into the hands of the United States court and was operated by three receivers. By agreements with the administration of the city of Pittsburgh the report now made public includes the entire year, and the various statements are based on the full years' activity. Gross revenue from railway operation was $22,063,776 and net income for the year $10,075. But these figures tell only part of the story. The year was one in which the management had to feel its way and adjust itself to a changed environment.

Revenues of the railway were well maintained during the year even though the general business depression caused some recession as compared with the previous year. The budget requirements and operating expenses were kept within bounds, with the result that the report shows a small surplus with ample funds being used for rehabilitation of property and the providing of better service. Nearly 19 miles of track were rebuilt.

The company says that the policy of furnishing more and better transportation service has been productive of increased earnings. This policy will be continued, and it is expected that still better results will be obtained in the future. Among the innovations which were tried was the Sunday 25-cent pass, extension of transfer privileges and special Sunday 10-cent transfer. In two cities, Washington and McKeesport, a weekly pass is being tried out. Of the new commercial department it is said some new innovations have resulted and a feeling on the part of patrons that the railway was co-operating to give the best possible service. The results have been gratifying.

Negotiations are in progress with the Philadelphia Company and one of its subsidiaries to supplement the transportation service of the Pittsburgh Railways with buses. The railway is not in a position to finance such additional operations. A contract between the ralway and the bus company will protect the railway and is expected to be of mutual advantage in rendering adequate and effective service.

The need for rapid transit as well as adequate trolley service is evident, and ways and means are being studied to meet these conditions. While it is realized that railway service in Pittsburgh is rendered under great difficulties, a situation prevails now because of improved service, new equipment, arrangements to meet changing conditions in the communities served, of harmonious feeling which embraces the municipal administrations, the railway and the public. It is the endeavor of the management to continue this situation and improve the service.

Termination of the receivership on Feb. 1, 1924, was made possible through the contract or agreement with the city of Pittsburgh, which was of a mutual nature and in brief provides:

Recognition of property valuation established by the Public Service Commission.

Annual return of sufficient amount to pay fixed charges, including return on some Philadelphia Company holdings, plus interest on new money put into the property.

Car fare to be adjusted to provide sufficient revenues to meet the allowed return on investment after operating expenses, depreciation, taxes, etc.

Previous license fees, paving charges, taxes, etc., to be substituted by blanket payment aggregating $300,000 per annum, payment to be made only when earned.

Establishment of a traction conference board to represent the city and the boroughs which entered the agreement, the public, and the railways. The board is composed of four members, all of whom are to receive annual compensation.

An incentive for economical management through a division of any surplus.

It is explained that this contract also paves the way for readjustment of capitalization to result eventually in one ownership of corporate properties that now number more than 100.

SUMMARY OF INCOME OF PITTSBURGH RAILWAYS FOR THE YEAR ENDED DEC. 31, 1924

(Prepared in accordance with the terms of the agreement between the city of Pittsburgh, sundry other municipalities, Philadelphia Company and Pittsburgh Railways.)

Gross revenue from street railway operations		$22,063,776
Operating expenses:		
Maintenance of way and structures	$2,685,014	
Maintenance of equipment	2,513,962	
Traffic	160,225	
Power	2,034,876	
Transportation	7,440,743	
General	761,235	
Miscellaneous	1,764,846	
Taxes	668,017	
Total		18,028,918
Net revenue from street railway operations		$4,034,859
Auxiliary operations:		
Operating revenues	$182,357	
Operating expenses	125,607	
Net revenue from auxiliary operations		56,750
Total net revenue from operations		$4,091,608
Non-operating revenues:		
Rental of real estate and buildings	$30,777	
Interest and discount	299,985	
Miscellaneous	3,405	
Total	$334,167	
Non-operating expenses	16,233	
Net revenue from other operations		317,934
Gross income		$4,409,542
Income charges:		
Items under agreement:		
Return of 6 per cent on property valuation of $62,500,000	$3,750,000	
Return of 6 per cent on additional capital of $5,000,000 for new property	300,000	
Payments to city of Pittsburgh and other municipalities in lieu of licenses, paving assessments, etc.	331,019	
Items not under agreement:		
Interest on judgments and settlements	15,464	
Rental of Seventeenth Street incline plane	2,984	
Total		4,399,467
Net income for the year		$10,075

STATISTICS OF OPERATIONS OF THE PITTSBURGH RAILWAYS FOR 1924

Miles of road		329.27
Miles of track		592.06
Car houses		23
Car shops		5
Passenger cars—motor	1,088	
Passenger cars—trail	238	
Miscellaneous cars	257	
Total cars		1,583
Passengers carried—revenue		272,315,161
Passengers carried—total		324,688,853
Car-miles operated		39,593,051
Car-hours operated		4,455,466
Earnings per passenger car-mile—cents		55.3
Average fare per revenue passenger—cents		7.95

As provided for in the contract with the city, a current liability of approximately $8,200,000 was assumed and the various creditors agreed to take one-tenth of their claims per annum over a period of ten years, without interest.

Immediately on return of the property to corporate management arrangements were made to consummate the $5,000,000 of new financing, which was provided for under the agreement. These arrangements were made through the Union Trust Company, Pittsburgh. There were issued $2,000,000 of 6 per cent notes, maturing serially over a period of four years; $3,000,000 of 6 per cent car trust bonds, maturing serially over a period of fifteen years.

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The proceeds of the equipment trust bonds purchased 225 modern passenger cars. The proceeds of the note issue are being spent for improved carhouses, shop equipment, tracks, etc. Nearly all of the $3,000,000 has been used, and practically all of this equipment has been received or is en route. A small portion of the $2,000,000 has been spent and the balance will be expended during next year.

The matter of refunding and refinancing the railways is progressing and it is hoped and expected that in the next annual report a satisfactory plan will be announced.

Among the problems confronting the management of the railways the first year was the adjustment of wages as proposed by the motormen and conductors. The working agreement with the men expired on April 30. After protracted negotiations there was a cessation of service for about 60 hours. As a result an agreement was entered into to continue the contract with the men for a period of two years at the same rates of pay.

Operating Income Higher

Boston & Maine's Electric Lines Show Improvement—Report Gives Details of Bus Plan

The 92d annual report of the Boston & Maine Railroad to the stockholders explains in detail the company's plan of correlating rail and bus service "with the hope of bringing about an economic relationship which will avoid wasteful duplication of transportation agencies and result in benefit and convenience to the public." Reference has been made in the ELECTRIC RAILWAY JOURNAL previously to the activities of the Boston & Maine Railroad in that direction. President Hustis states that because of the belief that in many instances transportation on rails could be better and more economically performed by motor vehicles on the highways the Boston & Maine Transportation Company has been incorporated to undertake highway motor service where the traffic warrants. This company will also supply service when other means of transportation are not available. In this way the discontinuance of railway lines as may be authorized will be accomplished with the least possible hardship to the communities affected.

Competition of common carrier passenger buses along the main line routes of the railroad became so keen in 1914, particularly in Massachusetts, in which state no certificate of exigency is required, that it seemed necessary for the railroad to present its case to the various cities and towns where bus companies were applying for licenses to compete with the railroad. Some cities and towns have declined to issue licenses to independent bus lines, recognizing that they were taking from the railroad the more profitable standard fare traffic, and that, deprived of this traffic, the railroad could not afford to continue low rate service for commuters. In some instances where such bus companies continued to operate without licenses, in violation of the law, legal proceedings were taken and are now pending.

The report for the year 1924 segregates the electric railway earnings. The accompanying statement shows figures for the operation of the Portsmouth Electric Railway, running from Portsmouth to Hampton, N. H., and the Concord Electric Railway, which operates from Concord to Manchester and Penacook, N. H., both under the supervision of the Boston & Maine.

PORTSMOUTH ELECTRIC RAILWAY AND CONCORD ELECTRIC RAILWAY

	Year Ended Dec. 31, 1924	Dec. 31, 1923
Passenger revenue	$263,529	$298,787
Other revenue	11,675	16,125
Total	$275,204	$314,912
Expenses:		
Maintenance of way and structures	$32,039	41,477
Maintenance of equipment	47,946	69,748
Power	37,042	47,093
Transportation	83,315	87,442
Other expenses	16,809	17,884
Total operating expenses	$217,152	$263,645
Net revenue	58,053	51,267
Tax accruals	24,817	24,308
Operating income	$33,236	$26,959

Surplus for January Quarter on Rochester Lines.—The report of the operations of the Rochester lines of the New York State Railways for the quarter ended Jan. 31, 1925, shows a surplus of $33,627 in excess of the 6 per cent guaranteed return on its property investment under the service-at-cost contract. From railway operations alone a surplus of $38,814 is shown, with a deficit from bus operations of $1,384 from the crosstown trackless trolley line and $1,349 from the Dewey Avenue bus feeder route. The balancing account of Jan. 31 shows a deficit of $251,564.

Fitkin Interests Reported After More Railways.—An agreement is reported looking toward the sale of the Municipal Service Company, Philadelphia, Pa., to Fitkin & Company, New York. The Municipal Service Company owns the Citizens' Traction Company, Oil City and Franklin; the York Railways, York, Pa., and the Youngstown & Suburban Railway, Youngstown, Ohio.

Security Issue Sought.—The Key System Transit Company, Oakland, Cal., has applied to the Railroad Commission for authority to issue and sell $500,000 of its series B first mortgage gold bonds, dated Jan. 1, 1925, and due July 1, 1938, and bearing interest at the rate of 6 per cent. It is proposed to use the proceeds from the sale of these bonds in acquiring all the properties of the Oakland & Haywards Railway and the East Oakland Railway and to redeem all outstanding bonds of those two corporations.

Belt Line Increases Earnings.—Operation of the Tacoma Municipal Railway, Tacoma, Wash., as an industrial belt line for the tideflat district resulted in increasing the car line's earnings by $1,525 during February, a figure nearly double the best previous showing, according to the report for the month. The city is ahead $4,238 on belt line operation for the past four months, it is reported.

Deficit for Eight Months.—For the eight months ended Feb. 28, 1925, the Interborough Rapid Transit Company, New York, N. Y., showed an increase in total revenue from all sources of $567,972 over the corresponding period ended Feb. 29, 1924. This advance was more than offset, however, by increaase in taxes and in income deductions, chiefly higher Manhattan (elevated) rental, which became effective July 1, 1924, under the readjustment plan. While operating expenses were lower than during the preceding period, there was a deficit for the first eight months of the current fiscal year of $247,700. Compared with a similar period in 1924 this figure represented an improvement of $1,047,389.

Merger Talk Started in Washington.—Officials of the Washington Railway & Electric Company and of the Capital Traction Company, Washington, D. C., have had one informal conference recently to consider the possibility of bringing about a merger. No further developments are expected, however, for some time. Just before adjournment Congress passed a bill authorizing a voluntary consolidation, with a proviso that the actual terms of merger be ratified by Congress at the next session. Following passage of the act the chairman of the Public Service Commission of the District suggested to the heads of both companies that they confer informally on the question. At the same time the commissioner let it be known that the commission stands ready to assist in arriving at a basis for a union of the two systems should later developments warrant such a course.

Revenues Showed Decrease in February.—In spite of diminishing jitney competition, total revenues from the railway department of the Georgia Railway & Power Company, Atlanta, Ga., showed a decrease of $23,650 during the month of February compared with February of last year. This brings the total decrease for the last eight months up to more than $263,650. The February decrease was $4,650 greater than the $19,000 figure of January. March figures, however, are expected to show the effects of jitney elimination.

Old Equipment Sold.—The Quincy Street Railway, Quincy, Ill., recently sold to a junk dealer sixteen cars which had been idle in the carhouse, many of them since the days after the mule cars. The Quincy system has 28 cars in regular service and sufficient reserves to handle traffic loads.

Heavy Bond Issue Under Discussion.—Possibility of floating a $20,000,000 bond issue for the Seattle Municipal Railway, Seattle, Wash., with which to retire the present bonds, purchase new equipment, pave between tracks and make other necessary improvements is being discussed among members of the City Council. The present bonds against the railway bear 5 per cent interest. By floating an issue extending over a longer period, the advocates of the plan assert that the annual payments would not be so heavy, and the system would be in a position to buy new equipment, make extensions and needed improvements. The street railway department has gone back to a cash basis six weeks earlier than anticipated, owing to an increase in revenue and savings by the department. The date set for abandoning the warrant plan had been May 10, but was set forward to March 25.

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Legal Notes

CALIFORNIA.—*Company Responsible for Assault by Motorman.*

The conductor got into a dispute with a passenger in regard to transfers and summoned the motorman, according to rule, by emergency three bells. The motorman assaulted the passenger and this assault was held to be within the scope of his employment and the company was responsible. (Galloway vs. United R.R.'s of San Francisco, 232 Pacific Rep., 491.)

CALIFORNIA. — *Passenger Injured at Station While Crossing Track to Board the Car.*

A passenger lawfully on the premises of an interurban railroad at a place provided for the stopping of cars to take on passengers is not negligent *per se* in failing to stop, look and listen before crossing the intervening track to board a car. A shelter having three sides but no windows, provided by the carrier and used by passengers awaiting the arrival of cars was held to be a "station," as respecting the degree of care to be used by both passengers and carriers. (Wilkinson vs. United Railroads of San Francisco, 232 Pacific Rep., 131.)

CONNECTICUT.—*Burden of Evidence in Accident to Infant.*

A child five years old, while crossing the track, was injured in a city street by a trolley car. In a case of this kind, the Supreme Court of Connecticut declared the burden was on the plaintiff to adduce evidence of facts from which the jury might reasonably find the defendant's motorman was negligent as alleged and that such negligence was the approximate cause of the injury. (Simuaskas vs. Connecticut Co., 127 Atlantic Rep., 918.)

FEDERAL COURT—*Expert Witness Must Be Especially Qualified — Treatment of Depreciation, Franchises, etc., in Valuation*

This decision was in the District Court of the District of Colorado on the valuation of the Denver Tramway and was rendered Dec. 13, 1924. The company, through its receiver, claimed that the ordinance by which the city permitted the city to charge only 6 cents for fare was confiscatory, and asked permission to charge a higher fare from the federal court by whom the receiver had been appointed. The city intervened. Its answer claimed that the tramway was contractually bound to a 5-cent fare, and that the 6-cent ordinances were for temporary purposes only and did not change the contractual obligations of the company. The court appointed a special master to hear testimony as to the value of the property, and evidence was presented by Frank T. Woy and A. L. Drum for the company and Dr. D. F. Wilcox for the city. In its decision rendered Dec. 13, 1924, the court reviews the qualifications of each of these witnesses to act as an expert on valuation and it held that Messrs. Drum and Woy could qualify as expert witnesses on the value of the railway property but that it was an error in matter of law to permit Dr. Wilcox to testify as such an expert. The court also said that, ordinarily, reproduction cost new, less depreciation, is the dominant factor in the valuation inquiry under consideration, and it must be the rule where there are no other data on the subject. Testimony on values of experts who have given the subject long study and reflection ought not to be lightly weighed. The figures of the experts Woy and Drum on depreciation, as ascertained by inspection, and other items, were largely followed in the decision. An allowance was permitted for going value, but the court held that the value of the company's perpetual easements in the city streets, which was put at $2,000,000 could not be included in the valuation of the company's property for rate making purposes. The court upheld the receiver's plea that the 6-cent fare was confiscatory. (Westinghouse Electric & Mfg. Co. vs. Denver Tramway, 3 Federal (2d) Rep., 285.)

FEDERAL COURT.—*Greater Care Necessary by Motorman Where View Is Obstructed.*

The judge in a District Court charged the jury that where the view of a crossing is obstructed, increased caution is required of the person undertaking to cross the interurban track at this point, but he refused the request of the plaintiff's counsel to charge "that the defendant was required to use increased or greater care as it approached this crossing, if the weeds and bushes were on its own right-of-way." This refusal was held to be prejudicial error in the Circuit Court of Appeals, Sixth Circuit. (Napier vs. Northwestern Ohio Ry. & Power Co., 2 Fed. Rep. (2nd), 701.)

MARYLAND—*Railroad Liable to Person at Freight Yards Receiving Shipment Only for Injuries Arising from Concealed Peril.*

A truckman visited the freight yards of a railway company to take away a shipment, and to save time tried to remove the shipment himself from the bottom of a pile. Other freight fell on him and injured him. The railway company was not held responsible. (Texas Co. vs. Washington, B. & A. Electric Ry., 127 Atlantic Rep., 752.)

MASSACHUSETTS — *Attempt to Board Car at Alighting Platform.*

After leaving a rapid transit train at a platform, a passenger changed her mind and decided to board the next train. When it arrived and all passengers leaving the car at that point had disembarked, she attempted to enter by the open door but was caught by the door and thrown to the floor. It developed that there were two platforms, one a loading and the other an unloading platform, and the company did not expect any passengers to board a car at the unloading platform, but as there were no conspicuous signs to warn passengers not to board the train at this point the company was held responsible for this accident. (Threlkeld vs. Boston Elevated Railway, 146 Northeast Rep., 367.)

MINNESOTA.—*Injury from Emergency Stop.*

A motorman made an emergency stop to avoid a collision with a vehicle and because of this sudden stop a passenger was thrown to the floor and injured. It was held that the company was not negligent as a matter of law, but that the case should be decided by a jury. (Sullivan et al. vs. Minneapolis Street Railway, 200 Northwest Rep., 922.)

MISSOURI.—*Last Clear Chance Doctrine in Case of Trespasser.*

Where a boy, while riding as a trespasser on the rear end of a trailer, was injured when the trailer backed against another car standing in the rear, the last clear chance doctrine was upheld. An instruction by the trial court requiring the jury to find, before rendering a verdict for the plaintiff, that the motorman of the rear car negligently failed to move his car backward, when in the exercise of ordinary care he could have backed car without danger to any person, was held by the Court of Appeals not erroneous for failure expressly to require the jury to find that there was free space into which motorman could back. (Finn vs. United Railways of St. Louis, 267 Southwest Rep. 416.)

NEW YORK.—*Value of Property for Rate-Making Purposes.*

The present increased cost of construction must be considered in determining the value of a public utility property for rate making purposes, and due weight must be given to present reproductive costs. It is inadequate to use the average of the ten-year period prior to the date of valuation. Where a power and light company had been allowed a low rate of return for a long period, it was entitled to a return of more than 7.1 per cent on the value of its property. (People ex rel. Adirondacks P. & L. Co. vs. Public Service Commission, 217 New York, Sup., 284.)

OKLAHOMA.—*Time Taken at Stops.*

It is the duty of a street railway company, at car stops, to stop the cars a sufficient length of time to afford passengers an opportunity, by the use of ordinary care and diligence to alight therefrom while the car remains stationary. (Oklahoma Union Railway vs. Mitchell, 231 Pacific Rep., 1062.)

WISCONSIN. — *Care Required of Driver of Automobile.*

Where the driver of a heavily loaded truck drove it onto a car track, when his view of the track was obstructed because of an automobile parked at the curb, he was negligent as a matter of law, although the trolley car which struck him was going at illegal speed. (Griffin vs. Milwaukee E. R. & L. Co., 201 Northwestern Rep. 254.)

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Personal Items

New President in New England

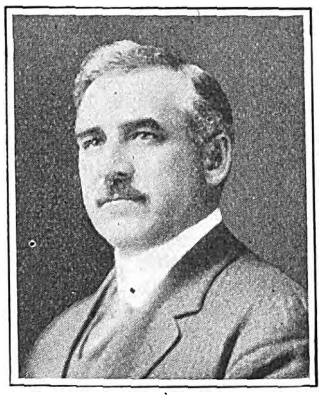
Operator of the Holyoke Street Railway Elected President of the New England Street Railway Club

Louis D. Pellissier, president and general manager of the Holyoke Street Railway, Holyoke, Mass., was elected president of the New England Street Railway Club at the meeting on March 26. Mr. Pellissier, with his brother, George, who is assistant general manager and chief engineer of the company, has made an enviable reputation in handling this 70-mile Massachusetts road. In fact, his work has attracted attention even outside of the electric railway industry. Not so long ago an editor of one of the foremost papers in the country, a man concerned only incidentally with railway operations, expressed the wish privately that more railway men had the knowledge and insight into railway matters possessed by the Pellissier brothers. He wanted to get them to make recommendations in his own city, but said he realized that it was impossible. He lamented that fact, but said he recognized it was the prerogative of the Pellissiers to stick to their knitting.

This is exactly what they have done. They have applied themselves intensively to their own tasks, and their application has been intelligently directed. The Holyoke property has one of the few zone systems in the country. Like many other cities, Holyoke found during the war that it was necessary to raise fares. The maximum fare on the Holyoke system was, however, kept down by dividing the property into a number of zones on the principle of one zone in each community. The layout of the system is well adapted for this plan. With this sense of salesmanship has gone the realization of the need for keeping up the physical property. As a result the Holyoke Street Railway is one of the best maintained in the country. In fact, in 1917 the company passed its dividend rather than curtail the appropriation for maintenance. It is significant that the company has an unbroken dividend record for 30 years, except in this one instance; that it is now paying 6 per cent and that for much of this long period it paid 8 per cent.

Louis D. Pellissier began his work for the company immediately after his graduation from business college in Springfield, Mass., in 1892. The Holyoke Street Railway had recently been electrified and Mr. Pellissier served first as a conductor. Three years later he was appointed bookkeeper and paymaster and continued in these positions until 1903, when he was elected treasurer of the company, acting also as claim agent. This office he retained until 1912 and then he was made vice-president and general manager. Upon the death of W. S. Loomis, president of the company, in 1914 Mr. Pellissier was made president. In 1919 he was also made treasurer and general manager of the Northampton Street Railway, which position he still holds. Since 1914 he has also been president of the Mount Tom Railroad, which runs the beautiful scenic resort known the world over as Mount Tom, together with its noted mountain railway.

Mr. Pellissier was born in Superior, Wis., Feb. 18, 1870. His parents settled in the historic old town of Hadley shortly after Mr. Pellissier was born, and there he grew to manhood. He attended the local public schools and Hopkins Academy, reputed to be the second oldest institution in the United States. He remained on the farm until he was 21 years old and then decided to enter business, for which he fitted himself by attending business college.



L. D. Pellissier

Last year Mr. Pellissier was vice-president of the New England Street Railway Club, representing Massachusetts. The club has six vice-presidents, one for each state in New England. Mr. Pellissier is a strong believer in association activities. He attends the conventions himself and sees to it that the members of the staff also attend.

Interstate Changes Announced

W. Marshall Dale has succeeded Ira E. Guthrie as secretary and treasurer of the Interstate Public Service Company, Indianapolis, Ind.

W. S. Campbell is purchasing agent in place of G. H. Dallow.

W. J. Fox is now superintendent of shops at Scottsburg, succeeding J. E. Hester, who resigned last May to enter business for himself.

Joseph O'Hara, general superintendent of the railway division of the Illinois Power Company, Springfield, Ill., is on an indefinite leave of absence to recuperate from a long illness. Carl E. Davis, former claim adjuster, will act in his place.

Mr. Storrs in New Office—His Book

Lucius S. Storrs, recently appointed as managing director of the American Electric Railway Association, entered upon the duties of that office on April 2. His desk in the temporary quarters arranged for him at the association's office was covered with flowers in anticipation of his coming. As one of his first acts Mr. Storrs had himself formally presented by Secretary Welsh to all the employees whether or not he had ever met them before. His services will be available to every electric railway in the United States. They will also be available to the public. One of his outstanding duties will be to act as a liaison officer between large national business or civic organizations and the electric railway interests.

As indicated very briefly in the ELECTRIC RAILWAY JOURNAL for March 26 Mr. Storrs was the guest of honor at a testimonial and farewell dinner given at the New Haven Lawn Club by the officers and heads of the Connecticut Company. John K. Punderford, the incoming president, presided. The speakers were unanimous in commending Mr. Storrs for his tact, diplomacy and fairness in dealing with the public and the employees and the successful manner in which he administered the affairs of the company at all times, and particularly through the war and the post-war period, with its many difficult problems, until now, when the property is regarded as second to none in the world. All expressed their regret at his leaving and were eloquent in their assurance of the high regard with which he is held by his associates and the public. Congratulations were showered upon him for the eminent position he is to occupy in the transportation industry and all predicted a continuation of his success in the broader field to which he has been chosen. The speeches were punctuated with much delightful humor.

At the close of the last address Joseph F. Berry, formerly counsel of the Connecticut Company at New Haven, acting in behalf of those present, presented to Mr. Storrs a beautiful silver loving cup.

A novel and impressive testimonial in the form of an album containing the signatures of more that 3,800 officers and employees of the company, which was compiled by William J. Sellner of the construction department, was also given to Mr. Storrs. It was prefaced with the following inscription:

Time, the Immortal, in whose book all things are recorded, opens its pages to receive the record of your passing to the newer and broader field of activity to which your ability as an executive has led.

It is with profound regret that we look upon your going (although knowing full well that it is a big step forward and upward) for we cannot help the selfish wish that it were not so. Nor can we doubt that you, too, find it difficult to sever the ties that for so many years have bound you to a company which, under your leadership, has grown to occupy the high position which the Connecticut Company now holds.

Appreciating to the fullest extent the honor bestowed upon you and upon us as a company by the election of you, our president, to the most eminent position in the electric railway industry, we offer you our sincerest congratulations and our best wishes for the continuation of that success which has characterized your progress.

And, in parting, we pledge ourselves to

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the maintenance of that high standard for the company which has ever been inspired by our association with you.

Following the presentation, Mr. Storrs responded feelingly to the many praises expressed during the evening and for the testimonials. He said the past fourteen years would live in his memory as the happiest of his life, claiming that whatever success he has attained was made possible only through the loyal co-operation of all. He prophesied for Mr. Punderford the same loyalty, the same faithfulness and the same success. Mr. Storrs said it was impossible adequately to express his regret at leaving so splendid a group of friends and co-workers and wished them Godspeed.

The committee of arrangements consisted of Walter J. Flickinger, Edward T. Chapman and John M. Hamilton.

At the speakers' table were: John W. Colton, Walter J. Flickinger, Edward M. Day, George D. Watrous, Charles Cheney, John K. Punderford, Lucius S. Storrs, Leonard M. Daggett, Joseph F. Berry, Victor S. Curtis and James W. Welsh.

G. H. Harris Acting General Manager at Oakland

Important changes have been made in the personnel of the Key System Transit Company, Oakland, Cal., most of which went into effect April 1.

C. O. G. Miller remains as president and W. R. Alberger as vice-president, but Mr. Alberger has temporarily relinquished his duties as general manager.

The acting general manager of the company is George H. Harris, formerly chief engineer, who was inducted into his new duties when Mr. Alberger started on a trip to the East the latter part of March. Mr. Alberger, it is announced, will visit Chicago, St. Louis, Detroit, Cleveland, Philadelphia, New York and other large Eastern cities, where he will study transit problems and make a report thereon when he returns to duty.

President Miller has denied that Mr. Alberger contemplates going on the retired list after his trip.

"The report has been repeated a great deal lately," he said, "and I should like to see it stopped."

A new position has been created—that of assistant to the president. This will be filled by C. C. Vargas, who will retain his duties as comptroller in charge of the auditing and accounting departments. The purchasing and stores departments will also be under him.

E. F. Smith, cashier, has been promoted to the office of assistant manager of the department of public relations, and Angus Clark has been advanced from land and tax agent to the position of cashier. He will also be assistant secretary.

Frank Locke has been appointed assistant cashier and Wayne Allen has been promoted from chief clerk of the purchasing department to assistant purchasing agent.

It is explained that constantly increasing duties compelled President Miller to ask for an assistant. The other changes are made, it is understood, largely at the behest of the new assistant to the president.

The land and tax office has been abolished and the several functions previously performed by that department have been distributed among the others.

J. Frank Johnson Resident Head of Toledo Traction

Announcement has been made in Toledo, Ohio, that Benjamin C. Adams, president of the Community Traction Company, and vice-president and general manager of the Toledo Edison Company for the last two years, is to leave soon for Kansas City to become head of a large company combining the gas properties of Henry L. Doherty & Company in several nearby states.

Management of the Community Traction Company will be put entirely in the hands of J. Frank Johnson, now vice-president and general superintendent. Mr. Johnson has been in the Doherty organization for a number of years, serving first as an executive with the Toledo & Western Railroad. He was one of the receivers of that property. Later he was sent to Toledo and assigned to the Community Traction Company, and some time ago was made general superintendent.

Mr. Adams will be succeeded as president by either Henry L. Doherty or Frank R. Coates. Mr. Adams has served on the Doherty properties at Joplin and St. Joseph.

Carroll L. Proctor, for three years head of the Empire District Electric Company, Joplin, Mo., will go to Toledo to succeed Mr. Adams as vice-president and general manager of the Toledo Edison Company. He was born in Charlotte County, Virginia, in 1880 and was graduated from the Virginia Polytechnic Institute. His first job was with the General Electric Company at Schenectady as a tester.

Later Mr. Proctor went to Athens, Ga., as general superintendent of the Athens Railway & Electric Company, and in 1912, when the property was taken over by the Doherty interests, he remained and has been a Doherty executive ever since. After seven years at Athens he was assigned to Joplin. He served for a time as vice-president and general manager of the Danbury Gas & Electric Company, Danbury, Conn., and later returned to Joplin.

Frank R. Coates remains as president of the Toledo Edison Company.

The change in Toledo will be effective about April 15.

Mr. Woodlock on I.C.C.

Thomas F. Woodlock, financial writer and a member of the board of directors of the Père Marquette and St. Louis-San Francisco Railroads, was sworn in April 1 as a member of the Interstate Commerce Commission under the recess appointment offered him by President Coolidge. Mr. Woodlock has resigned from the two railroad boards.

Forest E. Winterding, formerly connected with the Wisconsin-Minnesota Light & Power Company at Eau Claire, Wis., as civil engineer, has left that company to become chief engineer of the Wisconsin Traction, Light, Heat & Power Company at Appleton in charge of all construction work.

George Kuhn is superintendent of shops of the International Railway, Buffalo, N. Y., and not George Hulme, as was erroneously published in the ELECTRIC RAILWAY JOURNAL, issue of March 28, 1925, page 528. J. W. Hulme was superintendent of shops at Buffalo some time ago, but resigned in 1923 to become assistant superintendent of car equipment of the Interborough Rapid Transit Company, New York, N. Y.

L. E. Hollar was promoted to general superintendent of the Michigan Railroad and the Chicago, Holland & Grand Rapids Railway with headquarters in Grand Rapids, Mich., effective March 1. Mr. Hollar started with the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway at South Bend, Ind., in 1906 and remained there until 1920 as superintendent of transportation. He relinquished that position to become affiliated with the Michigan Railroad as superintendent of the Northeastern division, which he retained until his present advancement.

John L. Fahey has been made chief claim agent of the Scranton Railway, Scranton, Pa. He entered the employ of the company in 1913. Later he became affiliated with the claim department and acted as private secretary to his father. He continued in that capacity up to the time of his father's death on Feb. 16, 1925. Announcement of his appointment to succeed his father was made on Feb. 19.

Charles W. Chase, Gary, Ind., has been appointed general manager for Charles Currie, the receiver of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind. Mr. Chase is president of the Gary Street Railway. As general manager for the receiver of the South Shore lines, he will have active charge of the operation of that property.

A. G. Carson has been appointed manager of the Wisconsin Public Service Corporation, Green Bay, Wis., in charge of all utility departments. L. B. Works has been appointed assistant manager. Mr. Carson has been identified with Wisconsin properties for several years. In 1919, while manager of the Manitowoc & Northern Traction Company and also of the business of the Wisconsin Public Service Company in Manitowoc and Two Rivers, he had his field of operations extended by the additional appointment as general superintendent of the Wisconsin Public Service Company in Green Bay. Before going to Manitowoc he was superintendent of the Eastern Wisconsin Electric Company in Fond du Lac and chief engineer of the Wisconsin Electric Railway and of the Eastern Wisconsin Electric Railway & Light Company in Oshkosh for several years. He began his public service work with the Grand Rapids, Grand Haven & Muskegon Railway in the power and transportation department and later he was made chief engineer of the Winnebago Traction Company of Oshkosh.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

General Electric Sales Hold Up Well

Orders received by the General Electric Company, Schenectady, N. Y., during the year 1924 were $283,107,697, compared with $304,199,746 in the year 1923, a decrease of 7 per cent.

Unfilled orders at the end of the year were $68,958,000, compared with $87,112,000 at the end of 1923.

The export business of the company is conducted by the International General Electric Company, Inc. The total of all orders received by the International company during the year was $17,590,000, compared with $21,743,000 during 1923. The net sales billed were $22,590,107 during 1924, compared with $22,371,526 for 1923.

	1924	1923
Net sales billed	$299,251,869	$271,309,695
Less: Cost of sales billed, including operating, maintenance and depreciation charges, reserves and provision for all taxes	264,909,538	241,653,948
Net income from sales	$34,342,330	$29,655,746
Income from other sources	10,793,352	8,345,781
Total income	$45,135,683	$38,001,528
Less: Interest and discount on debentures and other interest payments, and additions to general reserve	5,900,135	4,476,410
Profit available for dividends	$39,235,548	$33,525,118
Less: 6 per cent cash dividends on special stock	1,195,405	656,379
	$38,040,142	$32,868,739
Less: 8 per cent cash dividends on common stock	14,404,980	14,289,316
Surplus in excess of cash dividends	$23,635,162	$18,579,423
Surplus at Dec. 31, 1923	82,762,095	.....
	$106,397,258	.....
Less: 5 per cent dividend paid in special stock, $9,005,035; delivery of Electric Bond & Share Company stock, $25,030,000	34,035,035	.....
Surplus at Dec. 31, 1924	$72,362,223	.....

The International company's business was conducted at a profit available for dividends of $2,474,845, compared with $2,469,463 in 1923. Dividends of $700,000 were paid during 1924, of which the General Electric Company received $592,082. This sum is included in the financial statement as part of the income from investments.

In carrying out the provisions of the Coffin Foundation the following awards were made for the year:

In May, 1924, the committee of the National Electric Light Association awarded the Charles A. Coffin medal to the Public Service Corporation of Northern Illinois and $1,000 to the Employees' Benefit Association of that company.

In October, 1924, the committee of the American Electric Railway Association awarded the Charles A. Coffin medal to the Northern Texas Traction Company of Fort Worth, Tex., and $1,000 to the Mutual Aid Association of that company.

The advisory committee of the company awarded forty-three Charles A. Coffin certificates of merit, carrying with them honorariums in cash to employees of the company for meritorious work and distinguished service performed during the past year. Among them were twelve workmen in the shops, seven foremen, fifteen engineers and nine members of the commercial organization.

$4,000,000 Order Impending

Plans and specifications for new subway cars which will cost between $3,000,000 and $4,000,000 have been sent by the Brooklyn-Manhattan Transit Corporation to the Transit Commission for approval. These plans call for subway cars of a type different from the present B.-M.T. subway cars. The new cars are known as triplex articulated cars. Each triplex unit is made up of three car bodies permanently united and mounted on four trucks with wide end doors to permit passage between cars. In capacity, each triplex unit, with its three car bodies, is the equivalent of two of the largest present subway cars.

The company already has under construction and nearly completed four of these triplex units, the equivalent of an eight-car train of the present subway cars. This train of cars will alone cost close to $300,000. It is expected that these new cars, now under construction, will be delivered in May of this year. In the progress of construction, various changes and improvements in the plans have been made and these are embodied in the plans now submitted to the Transit Commission for approval in order that the company may buy additional cars.

After approval by the commission, bids will be invited from car builders for 50 or 65 triplex cars, the equivalent of 100 or 130 present cars. If prices are sufficiently reasonable the larger number will be ordered and a program started of retirement of certain types of "L" cars. The company now has a number of "L" cars requiring major repairs which cannot be made because of inadequate shop facilities due to failure of the city to build shops, as it agreed to do in Contract No. 4 made in 1913. If the cost of new cars is reasonable as compared with the cost of repairing present "L" cars, the company states that it will place an order for the larger number of new cars.

The new cars were mentioned in the ELECTRIC RAILWAY JOURNAL, issue of Sept. 20 and Sept. 27, 1924, pages 466 and 538.

To Improve Organization of Executive Departments

It is expected that the Bureau of Mines will be transferred from the Interior Department to the Department of Commerce. The Bureau of Mines is a scientific bureau intended as a direct aid to industry and commerce. Its usefulness depends largely on its ability to co-operate with industry. This transfer, by Presidential order, is expected to follow the action of President Coolidge in transferring the Patent Office from the Department of the Interior to the Department of Commerce. In this connection Secretary Hoover said that a vigorous campaign should be undertaken for the removal of the present injustices toward American patentees and American manufacturers which exist by virtue of the character of patent laws in many other countries. He said that at the present time an American patentee is required to manufacture continuously in foreign countries under his patent or lose his patent rights. Further, that no such requirement is made in the United States. The result is that our inventors and manufacturers, in order to protect their inventions, have been driven to the establishment of a large number of factories abroad, whereas foreign patentees have been able to use their patents in the United States actually to prevent manufacture here.

Mr. Hoover stated that an international convention for the protection of industrial property would take place at the Hague on Oct. 8, 1925, at which the American government was to be represented and where proposals would be made for the equitable and equal treatment of patentees in all countries.

Gasoline Electric Buses on Long-Term Payments to Railways

The Electric Truck Transportation Corporation, 25-31 W. 43d Street, New York, N. Y., has announced that it is considering the opening of a new department to finance the sale to electric railways of gasoline-electric buses on an attractive basis of long-term lease payments.

Mr. Cardoza, president of the corporation, stated that it is the idea to confine the plan to the established utilities in the best position to operate the equipment properly.

Metal, Coal and Material Prices

Metals—New York	Apr. 1, 1925
Copper, electrolytic, cents per lb	13.625
Copper wire base, cents per lb	15.875
Lead, cents per lb	8.425
Zinc, cents per lb	7.43
Tin, Straits, cents per lb	52.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.95
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.75
Weatherproof wire base, N.Y., cents per lb.	18.75
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.1272
Turpentine (bbl. lots), N. Y., per gal	0.93

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New Sales Representative for Six Wheel Company in Chicago

P. B. McGinnis, mechanical expert and sales representative with the Chicago office of the Westinghouse Air Brake Company since 1911, has joined the Six Wheel Company, Philadelphia, in charge of sales in central Western territory, with an office in Chicago.

In 1902, at the age of 16, he entered the car repair department of the Frisco Railroad. He served a short time as wireman's helper with the Westinghouse Electric & Manufacturing Company when the Chicago Metropolitan Elevated was being equipped with multiple-unit control by that company. He then joined the elevated operating organization as air brake and control inspector and remained in that capacity for a period of five years.

In 1909 he was engaged by the L. B. Stillwell Company, New York, to assist in equipping the cars of the Hudson & Manhattan Railroad, then under construction at the plant of the Pressed Steel Car Company. Later in the same year he became general air brake inspector of the Inland Empire System, Spokane, Wash. In the summer of 1910 he again went East to take charge of air brake installation on the cars being built for the Hudson & Manhattan Railroad by the American Car & Foundry Company.

For about a year Mr. McGinnis remained with the Hudson & Manhattan Railroad as general air brake inspector, and then joined the forces of the Westinghouse Air Brake Company.

Rolling Stock

Knoxville Power & Light Company, Knoxville, Tenn., has announced specifications on the sixteen new cars referred to in the ELECTRIC RAILWAY JOURNAL, issue of March 14, page 436. The details follow:

Date order was placed	Feb. 27, 1925
Date of delivery	June 1, 1925
Builder of car body	Cincinnati Car Company
Type of car	Double-end, single-truck, closed passenger
Seating capacity	28
Total weight	19,000 lb.
Length over all	28 ft. 6 in.
Truck wheelbase	8 ft. 6 in.
Width over all	8 ft. 4½ in.
Height, rail to trolley base	10 ft. 3¾ in.
Body	Steel
Interior trim	Natural mahogany
Headlining	¼-in. Agasote
Roof	Arch
Air brakes	Westinghouse
Curtain material	Pantosote No. 89
Destination signs	Keystone
Door-operating mechanism,	National Pneumatic Company
Fare boxes	Cleveland
Heater equipment	Consolidated Car Heating Company No. 1522-I
Headlights	Ohio Brass WDF No. 28519
Journal boxes	3-in. x 6-in.
Lightning arresters	Electrolytic
Motors	General Electric, 35 hp.
Finish	Yellow enamel
Registers	None
Sanders	Air
Seats	Pullman type
Seating material	Green velour
Trolley catchers	Ohio Brass No. 13141
Trolley base	General Electric
Trucks	Cincinnati
Ventilators	Railway Utility Company honeycomb
Wheels	26-in.

Piedmont & Northern Railway, Charlotte, N. C., has placed an order with the Pressed Steel Car Company, Pittsburgh, Pa., for 150 automobile freight cars of 100,000 lb. capacity. These cars have Hutchins steel roofs with Hutchins steel ends. They are to have steel underframes with steel superstructure, 10-ft. 6-in. double door opening, cast-steel truck side frames, cast-steel truck bolsters and Westinghouse friction draft gear with Symington attachments. The cars are to be delivered about July 1.

Empire State Railroad, Syracuse, N. Y., will likely be in the market for six buses if the plans looking toward the installation of bus service in Oswego are carried out.

Missouri & Kansas Railway, Kansas City, Mo., it is reported, has purchased three new cars, at a cost of $14,000 each. Since the fire in Overland Park last month the company has borrowed cars from the Kansas City Railways.

United Railways, St. Louis, Mo., has ordered five six-wheel chassis from the Six Wheel Company, 1800 Lehigh Avenue, Philadelphia, Pa., not 1880 Lehigh Avenue, as reported in the ELECTRIC RAILWAY JOURNAL for March 28, page 530. The five bus bodies are being built at the plant of the St. Louis Car Company.

Track and Line

New Brunswick, Canada.—An electric railway is to be constructed from Caraquet to Plaster Rock, New Brunswick to join the Canadian Pacific Railway Plaster Rock-Perth branch. Notice of application for charter has been given. The new line will be approximately 90 miles long. Indications are that a start in construction will be made this year on the Caraquet end. Operation of the line is expected to be from provincial hydro-electric stations, including a new development to be opened this year at Grand Falls.

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has completed work on the installation of double tracks on its Thirty-fifth Street line.

Power Houses, Shops and Buildings

Ottawa Electric Railway, Ottawa, Canada, has just completed its new shops, situated about ½ mile from the center of the city, which have been under construction since last April. The area of the shops, which are to be known in the future as Champagne Shops, is 235 ft. x 300 ft. The new building will contain the electrical shops, air-brake department, machine shop, carpenter shop, paint shop and another carhouse. The type of construction is structural steel frame, reinforced-concrete roof slab and floor slabs. Convenient to the carhouse section is a large conductors' and motormen's rest room. The storeroom, offices, paint shop, conductors' and motormen's rest room are heated by direct low-pressure steam. The remainder of the building is heated by an indirect system designed to keep temperature at 60 deg. The lighting wiring is run entirely in steel conduit.

Trade Notes

Wagner Electric Corporation, St. Louis, Mo., has announced the removal of its Atlanta office and service station on April 1 to 145 West Peachtree Street, also the removal of its Cleveland office and service station on the same date to 1412 East 25th Street.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has announced that Tom Moore, formerly purchasing agent of the Virginian Railway, has been appointed its representative in charge of the Southern territory. He is located at Room 811, Royster Building, Norfolk, Va.

Riley Stoker Corporation, Worcester, Mass., announces the following changes in sales representatives. G. H. Sanger has been transferred to the Chicago office at 541 Marquette Building, having formerly been located at the Philadelphia office. He succeeds E. W. Wagenseil, who has resigned to become sales manager for the Buckeye Drier Company. A new representative of the Riley Stoker Corporation in the Denver and Salt Lake territory is the Mine & Smelter Supply Company, with offices at Seventeenth and Blake Streets, Denver, and at Salt Lake City.

Page Steel & Wire Company, Chicago, Ill., coincident with the establishing of a welding service department to handle welding rod problems for customers, announces the appointment of J. J. Flaherty to direct sales of armco, high carbon and low carbon welding rod wire. Mr. Flaherty was formerly in charge of welding for the Boston Elevated Railway. He will have headquarters at Bridgeport, Conn.

Bridgeport Brass Company, Bridgeport, Conn., has announced that Alfred W. Lockwood has joined its sales organization as a special representative, operating out of the New York office, handling brass pipe and flush valves. For some years past he was connected with Cauldwell Wingate & Company, well known New York contractors.

New Advertising Literature

Plibrico Jointless Firebrick Company, Chicago, Ill., has issued a new edition of its catalog covering the subject of furnace lining. The booklet consists of 36 pages, some of which are devoted to the installation of monolithic furnace linings and the use of this lining for furnace fronts, arches, side walls and bridge walls in boiler furnaces and for heating furnaces, baking ovens and other industrial furnace and miscellaneous applications. A copy of this catalog will be sent free on request to the company at 1130 Clay Street, Chicago.

American Bridge Company, Pittsburgh, Pa., engineers, designers and manufacturers of steel towers, poles and other steel structures, has issued its 1925 edition of "Transmission Towers," a 200-page illustrated catalog covering steel towers and poles. "General Specifications for Steel Radio Towers" is added.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, April 11, 1925 *Number* 15

Purchase of Railway Energy Requires Change in Regulation Methods

ENERGY for the operation of many electric railways is now either purchased in whole or in part from comparatively large electric power systems. Railway load is considered as bulk supply. Regulation of voltage for railway bulk supply frequently is defined by a hazy clause in the usual contract, such as "Small variations of frequency or voltage to be allowed." The result in many cases is high voltage during hours of light load after midnight and comparatively low voltage during railway peak hours. This is exactly the opposite of what is desirable for car operation. The drop in a.c. voltage from the lightly loaded hours to the peak periods may be in the neighborhood of 10 per cent. Flash-overs on owl car equipments set an upper limit to the d.c. voltage and this in turn dictates an undesirable lower potential in the morning or afternoon peaks.

When power systems were smaller and were regulated at the source for the ultimate consumer, the compound-wound synchronous converter without auxiliary means of regulation gave a reasonably satisfactory account of itself in railway service. Even with the change in power supply, the same method still prevails in many cases, despite its unsatisfactory control of voltage.

In the article in this issue Mr. Woodbridge describes the solution he has worked out for the voltage control problem as applied to the delivery of power for street railway service in San Francisco. Regulation of transformer ratios under load to offset all reasonable variations of the supply does away with the need for the compound winding, thereby giving the equipment a more drooping voltage characteristic. According to Mr. Woodbridge, this results in greater peace of mind of the operating force, which is reflected in the operating accounts in the shape of less spare apparatus required and less apparatus in service.

A Novel Method for Disposal of Substation Losses

DESIGN of all classes of rotating electrical machines ranging in size from railway motors up has tended more and more during recent years toward directed ventilation. The last type of machine to be affected by this tendency is the rotary converter. The excuse for this lag is that converters are high-speed machines which have inherently low losses and excessive windage. They can therefore stew in their own juice without ill effects. Of course windage is no aid to final disposition of the losses where large units are closely confined in small quarters, as they must be in restricted locations.

When applied to converters the real disadvantage of directed ventilation as ordinarily practiced is that it necessitates the inclosure of one end or the other of the machine, both of which should be open for most convenient inspection and maintenance. An unusual solution of this problem is described in an article by J. E. Woodbridge in this issue. With the arrangement adopted both ends are open, giving convenient access and ingress of air from the operating room, the inclosure covering the field structure, access to which is required much less frequently.

The system of ventilation in this case reverses usual practice, drawing air from a monitor on the roof into the machines and into the tops of air-blast transformers. From both of these it is blown out through ducts in the basement. This is said to keep the operating room cool and to eliminate street dirt, reducing the need of conditioning apparatus, provided offensive chimneys are not in the vicinity of the monitor. Warmth for the station when required can be obtained either by blocking or by short circuiting the ventilation path. Draft forced in this way by the centrifugal action of a converter armature, which in 60-cycle work usually has a peripheral speed of from 1½ to 2 miles per minute, is easily able to overcome the natural tendency of warm air to rise, and the restriction of windage tends toward an improvement in efficiency.

Annual Report Reflects Improvement in New Jersey

CAREFUL reading is suggested of the report of the Public Service Railway of New Jersey, an abstract of which is published elsewhere in this issue. In many respects this is an unusual statement. Not only does it indicate the measure of success that has attended the company's efforts to rehabilitate its railway lines, but it shows the extent to which the Public Service Railway is engaging in bus operation. The conversion of the system from two-man to one-man operation has been the subject of extended comment in these columns, but the report emphasizes the importance of this change and reflects in the operating statement the extent to which this and other operating economies have been carried.

As President Thomas N. McCarter has pointed out, the effect of the economies so far introduced may reasonably be expected to be more apparent in the future. Aside from these matters another fact of outstanding interest is that the expenditure charged to fixed capital for buses was $5,493,790 in 1924 compared with $1,289,011 in 1923. The need for rebuilding or replacing many of the buses taken over reflects the extent to which bus operators were living out of their capital. The 5-cent fare unit appears to be working well. It was first tried in 1923 and has been extended to additional lines during the past year. Since the period covered by the report, it has been still further extended. All in all, the report reflects great credit

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on the perspicacity of those charged directly with the responsibility of carrying out the program of restoring the railway to its rightful place alongside of the other successful operating units of this state-wide system, which last year did a gross business of $87,689,-453 and returned net earnings of $5,583,072 available to the payment of dividends on the common stock.

Pruning the Branches to Strengthen the Tree

SIGNIFICANT among the developments of the last few years is the readiness with which a number of railway companies, both steam and electric, have sought to abandon unprofitable lines. A conspicuous example within the last month has been the Boston & Maine Railroad (steam), which has said that it wants to give up service on 186 miles of branch line railroad. Another notable example a few years ago was the Eastern Massachusetts Street Railway, which boldly abandoned a number of its unpaying branches.

Briefly the advocates of this policy reject the idea, long current by both public and railway companies, that a railway, like Tennyson's brook, must go on forever. The railway feared to allow the franchise to lapse lest the line be taken over by a competitor and operated to the detriment of the original owner. The public was opposed to such abandonment because it would leave the territory without transportation.

In the opinion of the advocates of the plan of curtailment, modern conditions have changed this situation entirely. To the average railway man, an unprofitable franchise is a distinct liability rather than an asset, and if the community served does not consider it worth while to make up for the loss from its operation it is hardly the duty of the railway company to do so. Hence, according to this policy, broadly speaking, a railway company should be as independent in such matters as a manufacturing company, which will close down an unprofitable department, or even its main factory, if times are bad.

In this automobile age, especially in the densely populated sections of the country, it is hard to imagine any community cut off from communication with the world simply because its rail transport has stopped. Automobile, bus and truck transport may not be as comfortable or as cheap as that by rail, but this is not an unanswerable argument for the indefinite supply of the better service at the expense of the railway stockholders. Much of this wayside business has gone to the rubber-tired vehicle already.

Calculating Profit or Loss on Transportation Service

DETERMINATION of profit or loss on an individual railway route, so that a decision may be made as to its retention or rejection by the operating company, is the real difficulty in the application of the rule proposed above. Where the company operates only a single line, it is no difficult matter to tell whether it is or is not covering expenses or returning a fair profit. But where the route in question is one of many, the segregation of revenues and costs is by no means easy.

On the revenue side, a number of the passengers may also ride on other routes and make them profitable, so that abandonment of the losing line may convert another line into a loser. Contrariwise, a line that apparently is making money may be doing so at the expense of some other line that could handle the business equally well and at less cost.

Expenses of operation, as well as overhead charges, can seldom if ever be determined individually for the routes of a system. The usual procedure is to make an allocation, which of necessity is based on the car-mile, the car-hour, or the mile of track. Such apportionment is at best only approximate, and may be far from the truth.

Still another complication arises in determining the value of a line. The operators of the property may feel that everything possible has been done to bring traffic to the line or to cut down expenses. Another operator, or a consulting engineer, who is able to inspect the property with a wider background, may see at once possibilities for more revenue and less cost.

Undoubtedly many of the lines which have been abandoned could have been placed on a profitable basis by the application of principles that have been worked out on other properties. In fact, there are some instances of roads which have been abandoned and have lain idle for a time, only to be taken up by others and operated with some degree of success. The decision to cease operation, then, is one that demands careful analysis, preferably by some one not too close to the immediate problem, and attention to all the points involved.

Furnishing Service Along Abandoned Routes

OPERATION of some form of public conveyance along a route abandoned should be preferable from the standpoint of the railway to no service at all. Even though some one else operated the line it would still be a feeder to the main road. Even though a railway may abandon operation on a branch line, for reasons set forth above, it still is often in a better position than any one else to conduct the operation of the substitute means of transport proposed. It has the organization and the transportation knowledge. Very often it has also the equipment and the means for keeping it in repair. In the Boston & Maine instance, Homer Loring, chairman of the company's executive committee, suggested that the substitute bus and motor truck service proposed should be supplied by the railway. He offered to leave the question of the amount of the service to be given and the fare to be charged in each case for the communities themselves to determine, the only provision being that the service and fares would be such that the revenue should at least equal the cost of operating the routes.

There is no doubt that there are a number of advantages in this new plan of operation—or of abandonment—if the reader prefers that word. Had it been adopted earlier in New England, some of the troubles experienced by the Eastern Massachusetts Street Railway, the Boston & Maine Railroad and the New Haven Railroad would not have occurred. In each of these cases the main routes were profitable, but great difficulties came to the property through losses incurred by operation on the branch lines. All in all, the plan has the merit of placing the cost of transportation where it belongs, namely, on those chiefly benefited.

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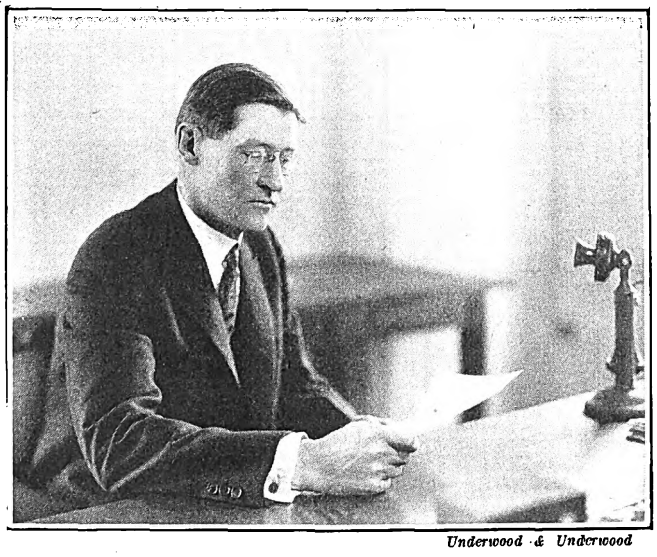
THE NEW MANAGING DIRECTOR of the American Electric Railway Association expresses a desire to co-operate to assist the industry in the many situations that are arising. In no sense is he to be considered a czar or a dictator to the electric railways.

Working with Our Shoulders to the Wheel

The Industry's Problems Can Be Solved



Underwood & Underwood

Mr. Storrs Is Quite at Home in His New Offices

LUCIUS S. STORRS, the new managing director of the American Electric Railway Association, deplores keenly the imputation of being a czar or a dictator, which has been put on him by the daily newspapers. This was almost the first thing that he said when asked by the managing editor of ELECTRIC RAILWAY JOURNAL to talk at first hand about his new duties. Of course, it seems almost ridiculous that any such notion could exist. Those who know Mr. Storrs at all well realize that if a czar were needed he would be one of the last men who could qualify for the part. Kindly, courteous, ready to listen to the other man's point of view, and withal having a keen insight into human nature, no one seems farther from the attributes that one looks for in a czar. Rather is he a big brother, ready to give his help to those who need it.

But the idea that he is to be a czar seems to be fairly widespread. It has distressed Mr. Storrs not a little. So he insisted on talking about that first. Not only did he talk about it, but he indicated that it would please him to have it mentioned first, although from the standpoint of the interviewer it might appear to be less important than other things that were said.

"I do not regard myself as 'czar' of the traction industry, as some of the newspaper headline writers have seen fit to call me," said Mr. Storrs. "I am anything but a czar on this job. What I really am and hope to be is a hired man, worthy of his hire and helpful to the industry.

"No one could possibly resent more than I do the appellation of 'czar.' It slipped into the newspapers, I suppose, because such a term made the news stories sound well, and because four-letter words fit easily in headlines.

"Certainly it did not get into the newspapers because I or any one connected with the American Electric Railway Association by word or act left the impression that I had any idea of being an overlord of any kind."

Although he has been on the job only since April 2 and has occupied his own suite of offices since the first of this week, Mr. Storrs has already got well into the swing of his new position and is laying plans for a wide range of activities. It should be explained, perhaps, that the work which Mr. Storrs will perform will be in addition to the service heretofore rendered by the association. The position of managing director was created because of the need for the whole time of an executive experienced in financing, managing, operating, employee and public relations, and the other problems which come up from day to day on large properties. The place was not created with any thought of performing the service heretofore given by the asso-

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ciation any differently, or in dividing the duties of the staff. They will function as previously, giving such aid to Mr. Storrs's office as will be helpful.

The familiarity of Mr. Storrs with association work has made it possible for him to step into his new position and co-ordinate his new work with existing facilities of the organization without a hitch. As president of the association he became thoroughly familiar with its machinery and personnel. Further, his devotion and attention to association affairs since leaving the presidency, in 1917, have been unflagging. Each year it has been a question as to what committees were most entitled to his services.

The open-door policy was one of the first which Mr. Storrs adopted upon assuming the managing directorship. Already executives have begun to call on him and they have found him ready and anxious to work in the rôle of friend and adviser.

Right there is the nub of the whole situation. It is just what Mr. Storrs hopes to be to the entire industry —a helpful friend and adviser. A spirit of mutual understanding and helpfulness underlies the whole ideal that Mr. Storrs has set up as his aim. His long successful connection with the industry gives him a particularly keen insight into the various problems that are developing constantly. Qualified as he is to deal with almost any situation that may arise, the managing director is, on the other hand, conscious of his own limitations. He knows that in his new endeavor nothing worth while can be achieved single-handed.

Necessarily he is proceeding slowly. Above all, he is making no promises as to what he hopes to accomplish. Just at the present time he is seeking mainly to acclimate himself. He was promised the co-operation of the industry by those who were responsible for his selection. That is all he asks. Results will depend largely on the measure of that co-operation. Said Mr. Storrs:

"It would be ridiculous for any one man to say that he alone could or would attempt to solve the manifold problems which face the transportation industry of the United States. But it is not ridiculous to say that all of us, working with our shoulders to the wheel, can solve them.

"Had the advisory council, which suggested to me that I accept the managing directorship of the industry, told me that I was expected to go out single-handed and fight the battles of traction, of course I should have refused to consider this position.

"But when the council—composed of large owners of the industry—came and offered its help and the help of the thousands of other workers in our field, then I accepted gladly, because I know that all of us, working together in a common cause, can bring order, excellent service and prosperity to the transportation business.

"I am ready to do my part to the fullest extent of my ability, and I want and need the help of every traction man."

Already there are indications that the industry is prepared to play the game along the lines Mr. Storrs has spoken of as essential to the success of the work into which he has entered. Invitations to meet railway men and requests that he attend meetings and dinners are coming in to him in large number. His engagement book is almost filled now for the next several months. While he considers that it is desirable to attend as many of these functions as possible, still he feels that in order to learn the problems which confront the industry it is necessary for him to go out into the field. Only in that way, as he sees it, will he be able to obtain the full co-operation of others. In the field it will be possible for him to meet the people with whom he will have to work out the details and get at first hand their immediate viewpoints.

Office Location Is Convenient

The association was fortunate in securing a suite of offices for Mr. Storrs on the twelfth floor of the Johns-Manville Building, 292 Madison Avenue, immediately below the offices into which the headquarters recently were moved. This makes it possible for him to attend the meetings and confer with the association staff and committees without loss of time. His telephone is connected on the main switchboard of the association, so that he is in close touch with the members of the staff at all times. The suite consists of a large reception room, an office for Mr. Storrs, and three other offices which will be occupied by his staff as the duties of the new position increase. Just at present, however, he is being assisted only by his secretary, Walter Jerome, who was his secretary while he was president of the Connecticut Company. Mr. Jerome has worked with Mr. Storrs for a number of years, so that moving to New York meant little more than a change of his office and his telephone number, so far as his relations with his chief were concerned.

WITH THE OPENING of his new offices, Mr. Storrs has taken up the work actively. But in order to make it a success, he needs the help of all. Let every railway man keep in mind his one request:

"I am ready to do my part to the fullest extent of my ability, and I want and need the help of every traction man."

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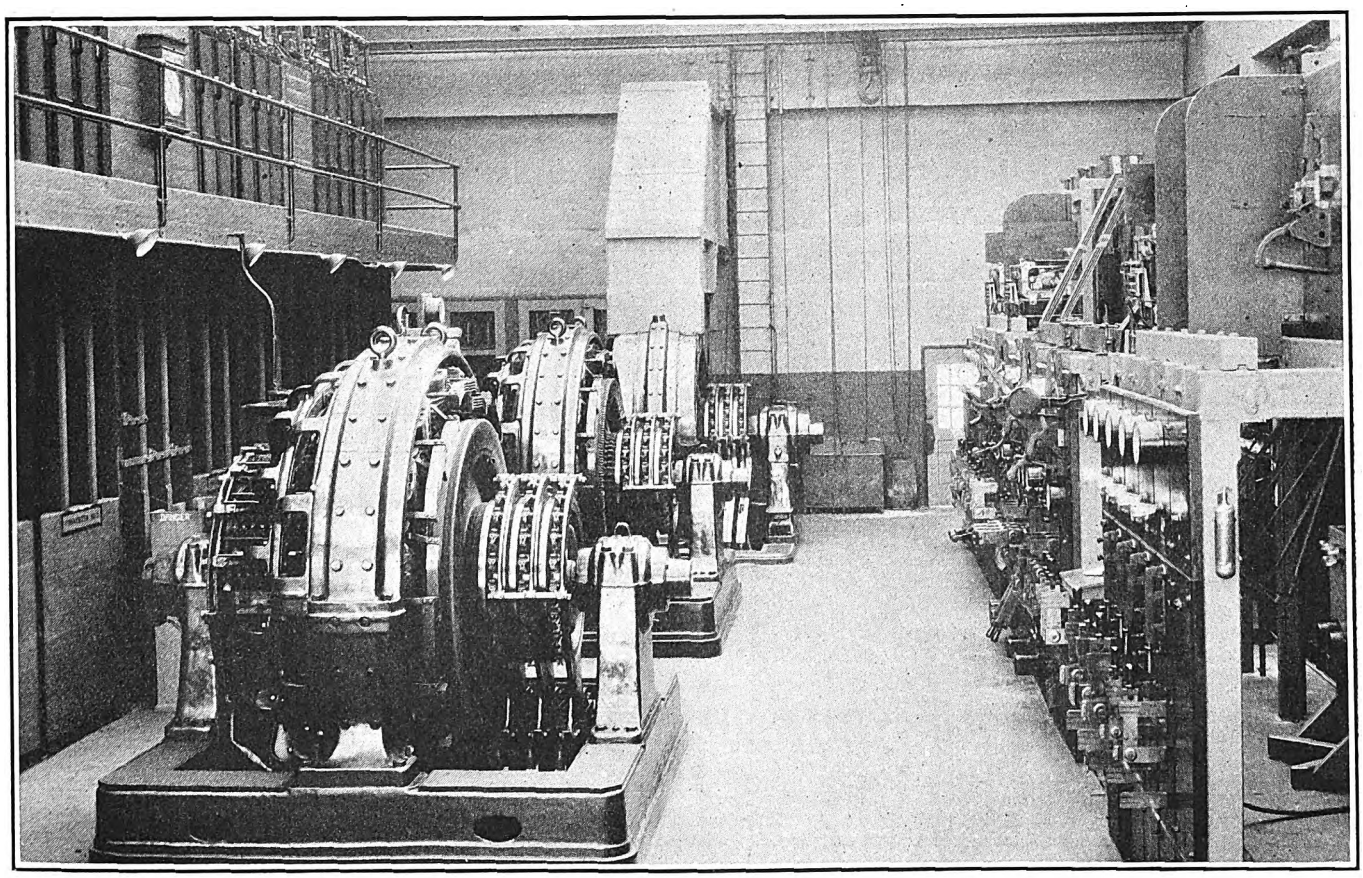
Developments in Substation Practice in San Francisco

Method of Ventilation Differing Materially from Ordinary Practice Has Been Adopted by the Market Street Railway—Shunt-Wound Converters Give Better Service than Compound-Wound Machines

By J. E. Woodbridge
Resident Engineer Ford, Bacon & Davis, Inc., San Francisco



This View of the Downtown Substation of the Market Street Railway Shows the Two 2,000-Kw. Converters and the New 3,000-Kw. Directed-Ventilation Machine in the Rear

THE growth of the city of San Francisco has increased the demand for power to operate the cars of the Market Street Railway to such an extent as to require two additional converting units during the past year. While the demand at each of the substations has increased the additions have been made to the stations containing rotary converters, and feeder copper has been altered in such a way as to divert load from the stations equipped with motor-generators to those equipped with converters. This has been done to obtain the economies of converters, which cannot be operated satisfactorily in the same stations with motor-generator sets.

The additions have been one 3,000-kw. unit in what is known as the Downtown station, which previously contained two 2,000-kw. units, and one 2,000-kw. unit in the Eighth Avenue station in the Richmond district, previously equipped with two 1,500-kw. machines.

The Downtown substation was originally installed four years ago with several features departing from usual practice. The station was described in an article by the writer in ELECTRIC RAILWAY JOURNAL for Aug. 20, 1921, page 269. It may be of interest to note at this time their performance. The converters are shunt-wound and supplied from transformers of the high-reactance type (15 per cent) usually advocated only for compound-wound units. The drooping voltage characteristic of these machines with increase of load, and particularly with excessive overloads, has been found to be advantageous in more ways than was anticipated. Unexpected severe increases of load, such as those due to other stations backing off or dropping out multiple feeders, are relieved, and the shunt-wound converters continue to operate at times when compound converters would trip their overload circuit breakers. Instead of the constant voltage characteristic of compound-wound machines regardless of load, shunt machines tend more toward constant power regardless of external demand,

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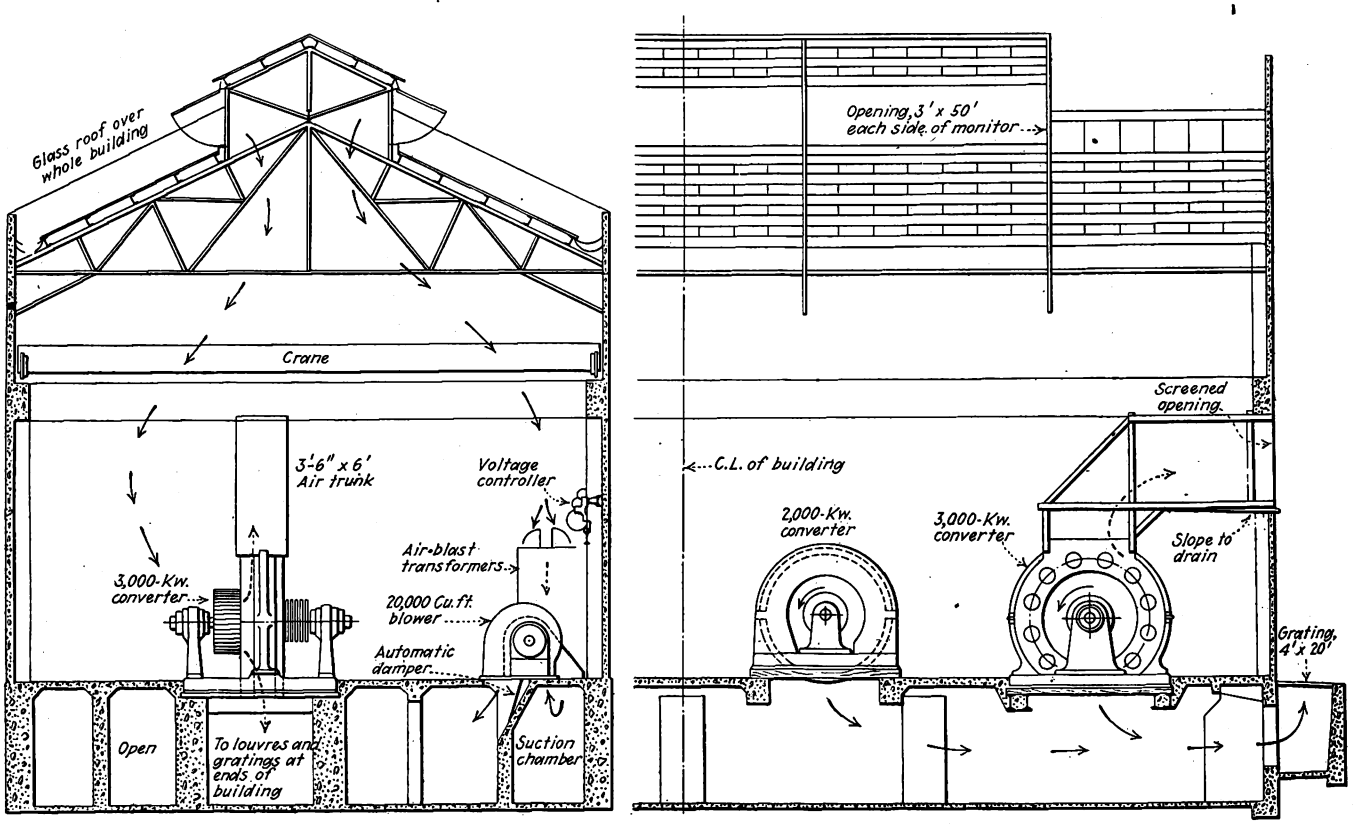
reducing load swings and relieving the supply system, the machines themselves, the circuit breakers and the feeders to that extent.

The influence of the voltage droop on the car service is inappreciable, giving the effect (without the loss) of a moderate feeder drop on the short feeders characteristic of a city center. In case of unusual loads due to car congestion the reduction of voltage probably results in a saving of energy. Contrary to some theories that have been published in technical proceedings, the effect of the shunt winding on the power factor of the converter is better than that of a compound winding. Reactive factor indicators with both current and potential elements connected between the transformers and the converters, thus giving the power factor at the rings, show a variation of 12 per cent without field

The original units were also supplied with manually operated voltage controllers consisting of contactors for varying the number of turns in the transformer primaries under load. The operating department has found these controllers of great assistance in regulating the d.c. voltage to railway requirements regardless of that delivered by the supply company. The drooping characteristic of the converters and use of the controllers make it unnecessary to keep running a margin of converter capacity to absorb unexpected load swings. It also has been found possible to continue service (momentarily at reduced voltage) when excessive overloads occur either due to increase of outside demand or to the accidental interruption of service from a machine within the station. In other words, the converters inherently back away from excessive overloads.



Plan of Directed Ventilation Adopted in the Downtown Substation of the Market Street Railway

adjustment over the full range of load and of consequent voltage drop. This is less than the difference between 99 and 100 per cent power factor.

The actual drop of d.c. voltage of the 2,000-kw. converters installed in the Downtown station four years ago has been found on test to be 45 volts from no load to 50 per cent overload or 5,000 amp. per machine, after correction to constant impressed voltage on the transformer primaries. The regulation curve is nearly a straight line over the total range tested, departing therefrom in the direction of an increase of droop at the overload end. In actual service there is the added drop in the a.c. lines supplying the station, due to the load. No such values of drop as 45 volts occur in normal service, as the momentary load fluctuations are only about 1,000 amp. per converter.[2] The drops obtained are comparable to ordinary impressed voltage fluctuations. But in cases of emergency, such as suddenly applied overloads, the lack of any tendency of the machines to "root in" is a notable contrast with the action of compound-wound apparatus.

They can be backed away still further if necessary by hand. This reduces the tendency of the row of machine breakers to blow one after the other like a row of ninepins, in case any disturbance occurs that is sufficient to operate one breaker when all are well loaded. This tendency is characteristic of compound-wound equipments. A station equipped with the shunt machines can be worked more closely to its breaker settings, i.e., its overload capacity, than can a station with compound-wound units, without the increased danger, to use the vernacular, "of losing the house," with attendant delays in restoring service. The actual available increase of capacity in kilowatt-hours output per peak hour is in this case estimated at about 20 per cent.

On account of the success of these features they were incorporated in the new units. These are shunt-wound, supplied from 15 per cent reactance transformers, and fitted with voltage controllers giving a range of 12 per cent of the ratio of transformation. The series field windings of the two older machines in Eighth Avenue have been cut out of circuit. One of

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these machines, operating shunt-wound, gave closer regulation than the two others in the same station and tended to take all the load swings. To overcome this, the series field has been cut in again reversed.

Directed Ventilation a Feature of New Converter

On account of ventilation difficulties inherent to a station in a densely built-up district the new 3,000-kw. unit in the Downtown station has been made with directed ventilation. In order to avoid inclosing the brush rigging on either the collector or commutator end, the unit was specified open to the substation room at both ends but inclosed around the armature periphery and the fields. Air is taken from the room through the commutator spider and is discharged radially through the armature, around the field structure and through four exhaust nozzles, two opening downward into the basement and the other two upward into an air trunk carried through the end of the building.

The inclosure of the machine restricts windage, which would otherwise be excessive and reduce the efficiency, especially at low loads, as the armature diameter is 7 ft. 6 in., giving a peripheral speed of 9,400 ft. per minute. Further restriction of windage is made by a baffle plate on the armature spider, which shuts off the entry of air from the collector end. This also keeps out collector ring cuttings. All the air which enters the armature is forced to come through the commutator spider, so that it effectively cools the commutator, which is of rather unusual size for a 60-cycle railway machine, being 52 in. in diameter by 24 in. effective length, with a peripheral speed of 5,400 ft. per minute.

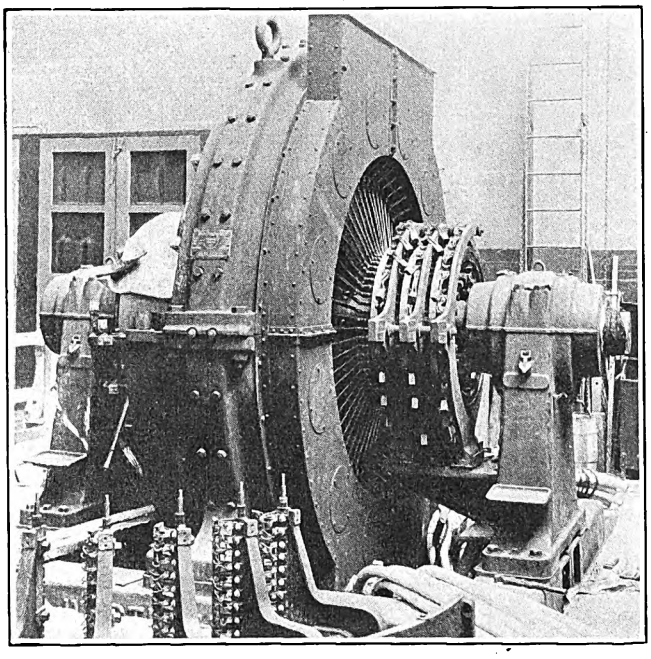
The separation of ingoing from outgoing air works satisfactorily as far as the new machine is concerned. Similar provision is now needed on the other machines since the heated air from them is now exhausted through the new machine.

Since the total station losses, with all machines at full load, amount to 500 kw., the movement of air required to avoid excessive temperature rise is considerable. For a temperature rise of 20 deg. F. the air must be moved into and out of the station at the rate of 75,000 cu.ft. per minute.

One of the older machines is now being experimentally inclosed. By this means all air will be taken, so far as possible, from above the floor and discharged below the floor. If this works out successfully it will mean reversal of the usual scheme of ventilation for such a station, outdoor air being drawn in through the roof monitor openings and discharged through the basement. To avoid passing the heated air from the air-blast transformers through the converters, the usual path of the air through them has also been reversed, the air being drawn in from the room through the tops of the transformers and discharged through their bases into a suction chamber, instead of a blast chamber. From there it is drawn by fans and discharged into another portion of the basement, where it joins the discharge from the converters and is delivered outdoors. This arrangement avoids discharge trunks over the transformers, where they would be in the way.

The converter frames are insulated from ground for the purpose of reducing the risk of a short circuit in case of a flashover from the positive brush rigging to the frame. The air trunk for the machine provided with directed ventilation is built of wallboard on a timber frame. This construction eliminates any chance of a ground and reduces the noise, which would be aggravated by a metal trunk. On account of its height the new 3,000-kw. unit is set with its base below the grade of the floor; an asphalt floor provides insulation at this point as well as safety to operators in case of an internal leak to the frame. The asphalt flooring has proved highly satisfactory. The same type of floor has now been laid in the Eighth Avenue substation.

The means usually adopted for starting small converters was chosen for the 3,000-kw. machine—namely, a starting switch in the secondary leads. This was found to be cheaper and simpler when the difficulties inherent to switching such large currents had been solved. The starting switch, rated at 4,000 amp. on each of its three poles, is of the double-single type operated by two handles, one-half of the blades making contact in the starting position and all of them in the running position, the two sets of blades being so mounted that they cannot make simultaneously both



The Nozzles for Directed Air Discharge on the A.C. End of the 3,000-Kw. Converter Are Shown in This Picture, Taken During Erection. The Nozzles on the D.C. End Are Not Yet in Place

running and starting contacts. This division of the switch into two separately operated parts makes it easy for one man to handle.

With the controller set for minimum delivered voltage the starting current of the 3,000-kw. machine is approximately 5,000 amp. per collector ring, or 105 amp. at 11,000 volts or 2,000 kva. This heavy secondary current is handled by the starting switch without burning or flashing. This current starts the machine from rest, and brings it up to synchronous speed in 38 seconds.

Sufficient study was made to determine that the low-tension connections between the transformers, the 3,000-kw. converter and the switchboard could be made more cheaply with cable than with bars, and that they could be made more safe. The total cross-section of copper to and from this converter aggregates 60,000,000 circ.mil. This is made up of three 2,000,000-circ.mil cables per phase of the six-phase circuit and six 2,000,000 cables for each d.c. terminal. Cables with a total cross-section of 48,000,000 circ.mil run to the starting switch for this machine. A careful design of the switch terminals was necessary in order to get the

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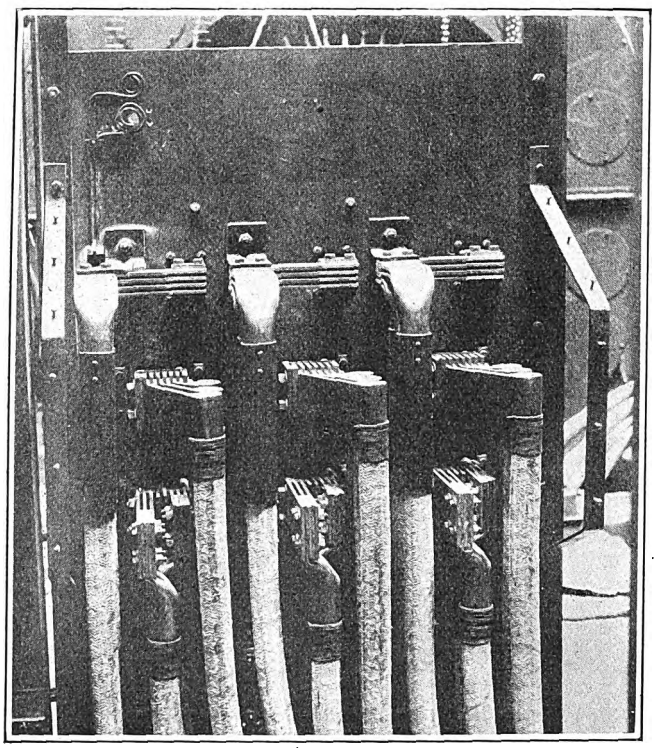
cables to them with proper clearances and room to reach bolts and nuts with wrenches.

The modifications of the auxiliaries of the new equipment from those of the older units are as follows:

The field rheostats are connected between the shunt fields and the ground side of the machines instead of between the shunt fields and the positive side. This change has been made in order to avoid the dangers of a violent short circuit in case of failure of the insulation of a field rheostat. The field rheostat of the 3,000-kw. machine is motor driven on account of its size, and indication of the rheostat resistance is given on the switchboard by means of a d.c. voltmeter connected across it. Incidentally this gives an added means of checking the polarity when starting. On account of the practical impossibility of calibrating the scale markings of large overload d.c. circuit breakers



Rear View of Low-Voltage Starting Panel for 3,000-Kw. Converter, Showing Connections to 24 Cables, Each of 2,000,000 Circ.mils

the breaker of the 3,000-kw. machine is made automatic on overloads through a relay operated from the shunt. This relay can be checked at will with a millivoltmeter. The relay in turn acts on the low-voltage release attachment of the breaker.

The power factor of the new machines is determined by means of reactive volt-ammeters instead of reactive-factor indicators as with the older machines. The former instrument has simpler connections and does not give exaggerated indications at low loads. In order to avoid errors of current transformers in close proximity to heavy leads the reactive instrument is connected to a primary current transformer but takes potential from the secondary side of the main transformers. At an indicated power factor of unity this segregates the magnetization of the transformers to the converter, and the balance of the reactive component set up by the transformers to the line.

The Downtown substation was originally equipped with low-speed d.c. feeder circuit breakers. Several flashovers occurred due to the low resistance of short circuits when contact wires broke down, even with cast-grid protective resistances in the worst feeders. With the new equipment five high-speed feeder breakers were installed and all feeder protective resistances were removed. No flashovers have occurred since the new breakers were substituted, although there have been cases of trolley wires down not far from the substation, including a case when there was only one machine in operation.

One of the high-speed breakers supplies a so-called hospital bus to which any feeder can be transferred. This breaker is regularly used for testing suspected feeders, so that all danger of fireworks is removed. While the high-speed breakers operate frequently, due to sudden rise of current suspected to be far below their setting, they are readily restored within a few seconds, being of the trip-free type, and the frequent operation does not deteriorate the contacts or call for undue renewals.

A few ideas have been adopted from automatic substation design, although the operation of this equipment is manual. The closing wire of the electrically operated oil switch supplying any converter is carried through interlocks so that the oil switch cannot be closed unless the converter brushes are raised and the transformer dampers are open. The low-voltage release of the d.c. circuit breaker is also supplied through an interlocking contact on the brush-raising mechanism so that the breaker will not remain closed unless the brushes are lowered.

The fans for the air-blast transformers in the Downtown substation are driven by 550-volt d.c. motors in order to simplify their control and to permit the use of lower speed and higher efficiency than can economically be provided with induction motors. A small range of speed regulation by armature resistance is also provided for reducing fan losses when less output is required as when running one converter. A Franklin air-pressure relay is so connected as to ring an alarm in case the air pressure fails. The relay circuit is carried through an extra pole on each fan motor switch to stop the alarm when the station is shut down and to close the alarm circuit positively when the station is started.

In the Eighth Avenue station the blowers are induction-motor driven. Since they cannot be started until a converter is in operation, a Franklin air-pressure relay is connected through auxiliary switches so that the alarm will not ring if the station is shut down, but it will ring if any converter is connected to the direct-current bus with no pressure in the air-blast chamber.

Return current from pipes, cable sheaths and carrier tubes in the area where such portions of the circuit may become positive to ground is brought in to the Downtown station through cables aggregating 3,000,000 circ.mils. These are connected to the negative busbar through switches intended to be opened when the station is shut down. Auxiliary switches are so connected as to ring an alarm if any converter is connected to the d.c. bus, and the drainage switches are open, or if all converters are shut down and the drainage switches are closed.

The extensions of the stations and of the conduit system, the installation of the equipment and the alteration of the feeders were carried out under the supervision of Ford, Bacon & Davis, Inc., consulting engineers to the railway.

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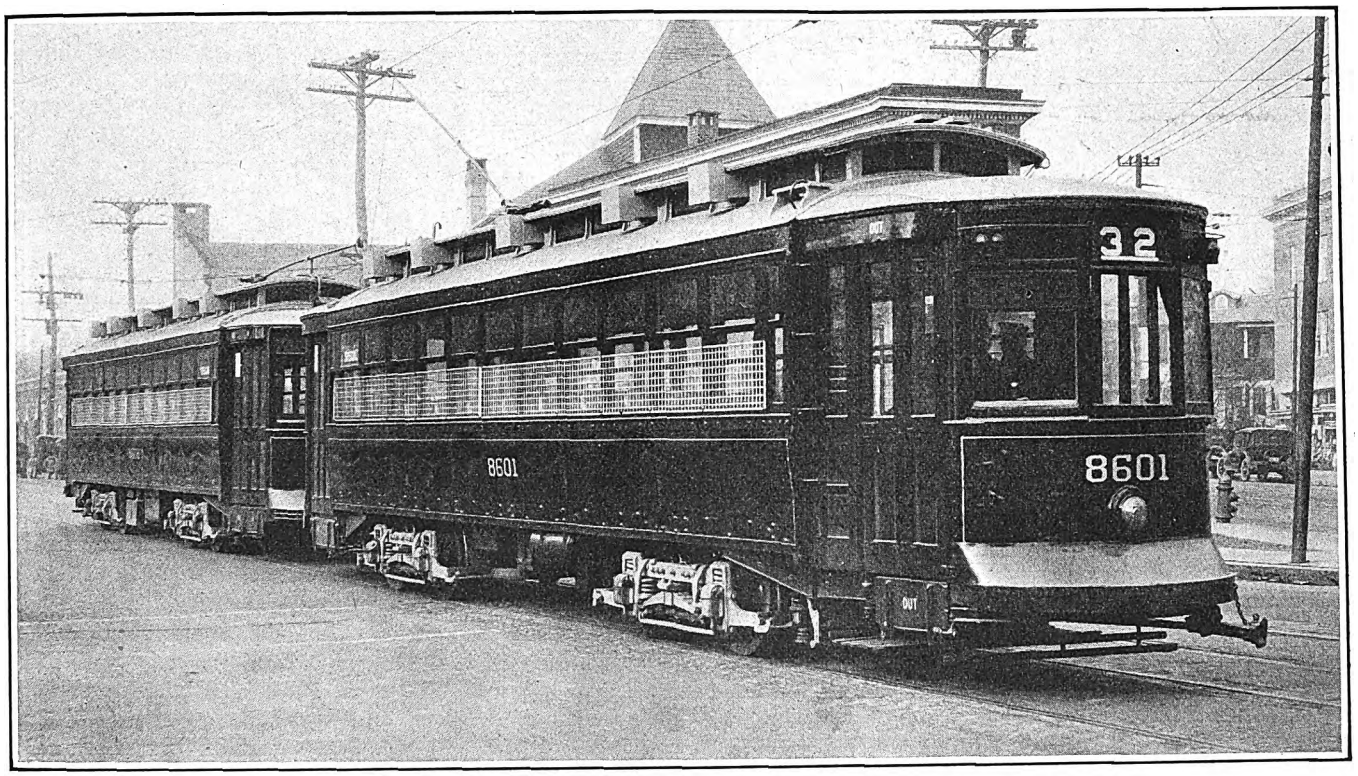

One Permanently Coupled Train of This Type Is Equipped with Material that Is Left Over from the Construction of Two Articulated Units

Rush-Hour Train Operation in Baltimore

United Railways & Electric Company Plans Soon to Have 292 Two-Car Units in Service—Permanently Coupled Trains Utilizing Remodeled Open Cars Are Equipped with Surplus Material from the Construction of Articulated Units—Multiple-Unit and Trailer Trains Are Also Used

EXTENSION of train operation by the United Railways & Electric Company of Baltimore, Md., has been found an effective means of reducing platform expense during rush hours. In recent years the morning and evening peaks have become sharper. The question of securing trainmen to operate the large number of tripper cars has consequently become more pressing. Two-car trains operated by three men are now being used in large numbers by this company to provide extra rush-hour capacity without a proportionate increase in labor cost. To carry this idea a step further, two-man articulated units are being built.

When the present building program is completed the railway will have 292 two-car units of various types. The following figures show the number of each type, the listing being in the chronological order in which they were placed in service:

TYPES OF TWO-CAR TRAINS USED IN BALTIMORE	
Trailer trains (100 trail cars and 105 motor cars)	100
Multiple-unit two-car trains	25
Peter Witt multiple-unit train	1
Articulated units	*110
Permanently coupled two-car train (experimental)	1
Permanently coupled two-car train	*55
Total	292

*Now under construction.

After a thorough study of the operation of articulated cars in Milwaukee it was decided to construct one such unit in Baltimore as an experiment. Two of the company's standard semi-convertible cars, each seating 44 passengers, were used. One vestibule was removed from each car and the truck nearest the removed vestibule was taken away. The two cars were then joined together permanently with a new truck common to both cars, thus forming a three-truck train. A hollow steel drum mounted directly over this truck forms a covered passageway between the cars. Rubber buffers form a tight joint, preventing entrance of air. This passage can be safely negotiated on any piece of straight or curved track on the system. A brief description of these cars was published in ELECTRIC RAILWAY JOURNAL for Dec. 6, 1924, page 964.

The leading body is provided with longitudinal seats, while the rear body is equipped with the maximum possible number of cross seats, together with a semi-circular seat on the rear platform. The total seating capacity of the articulated unit is 87.

The motorman is located at the center of the front platform and controls the double doors at that end, through which all passengers enter the car. The conductor is located at the front right-hand corner of the rear car, just back of the passageway between the first and second bodies. He collects all fares as passengers step from the drum into the second car and controls a double exit door at the front of the second car, through which all passengers leave the unit. Passengers in the forward body are, therefore, non-paid passengers, while those in the rear body have paid.

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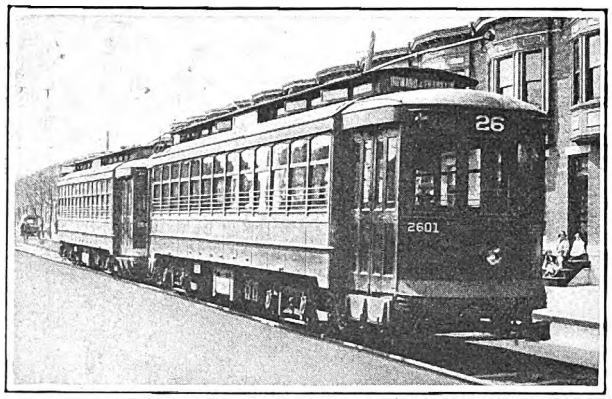
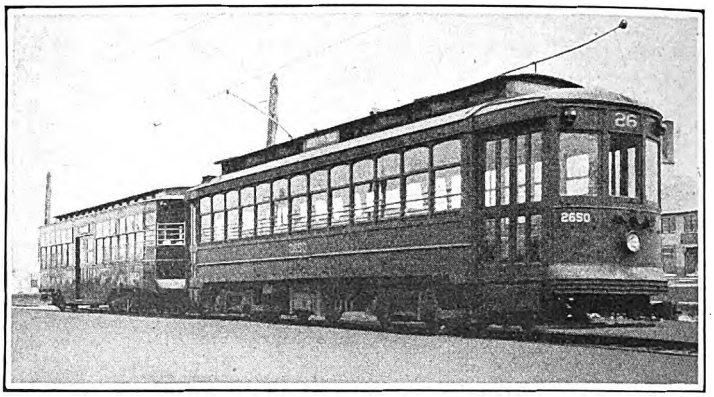


Multiple-Unit Cars Are Operated Singly During the Day and in Trains During the Rush



Standard Motor and Trail Car Train Used in Baltimore. A Second Trail Car Is Added When Riding Is Heavy

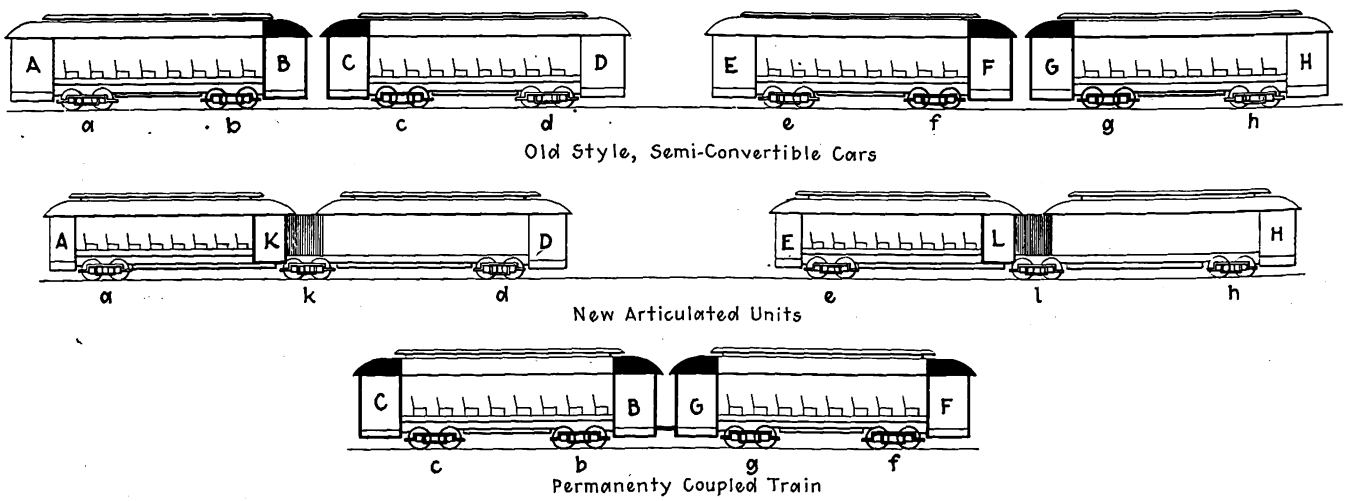
An emergency controller and air brake valve have been placed in a concealed position under the rear semi-circular seat for emergency operation in the reverse direction, and for shifting. A cadmium yellow color scheme used by the company to distinguish front-entrance cars has also been carried out in the articulated units.

The sample articulated car was placed in service in September, 1924, and its operation was closely watched for several months. The trial was entirely successful and construction was begun on nine more articulated units. It is expected to carry out an extensive program for building articulated cars during 1925, with the intention of constructing 110 units eventually. These articulated cars not only enable the company to handle its rush-hour traffic with a much smaller number of platform men than single cars would require but there is also a considerable economy in power and maintenance.

After constructing an articulated car there is left over as salvage two vestibules, two trucks, cross-seats from the leading body, motors, controllers and many other miscellaneous parts. One of the problems which had been confronting the company for several years was what to do with the 110 twelve-bench open bodies, which were no longer being used in summer service. These bodies had no equipment, the trucks, motors, controllers, etc., being transferred each spring and fall from and to the same number of closed bodies. The articulated car program suggested a plan whereby it would be economical to utilize these bodies, remodeling them into closed cars. Utilizing the salvaged parts on the open car bodies, a comparatively small additional amount was needed to close in the sides, build windows, etc., so as to turn out a first class closed car similar to the company's standard equipment.

One of the bodies was remodeled along with the construction of the sample articulated car and was placed in service on Dec. 8, 1924. This car was also observed very closely and was pronounced to be a complete success. It was later decided that these remodeled open cars could be successfully operated as two-car trains, coupled together permanently, and thus aid materially in the scheme of reducing the number of platform employees required for rush-hour service. Consequently, after the first open body had been converted into a single closed car, the succeeding bodies, as remodeled, were permanently coupled to form two-car trains. This necessitated multiple-unit instead of Type K control and different motor equipment, but it was found that the reduction of one employee per train would much more than offset the additional expense. Structural difficulties prevented the use of these bodies as articulated cars or there could have been a still further reduction in platform labor. The first permanently coupled two-car train of this type went into service Feb. 28, 1925.

How the various surplus parts of the cars made into articulated units were utilized in building the permanently coupled trains is shown in an accompanying diagram. The two vestibules remaining from the two semi-convertible cars forming an articulated unit were



One Permanently Coupled Train and Two Articulated Units Are Made from Four Semi-Convertible Cars and Two Open Car Bodies

Letters indicate the original and final positions of trucks and vestibules. K and L are new center-exit doors; k and l are new trucks.

Cross seats are removed from the first cars of the articulated units and placed in the open car bodies of the permanently coupled train.

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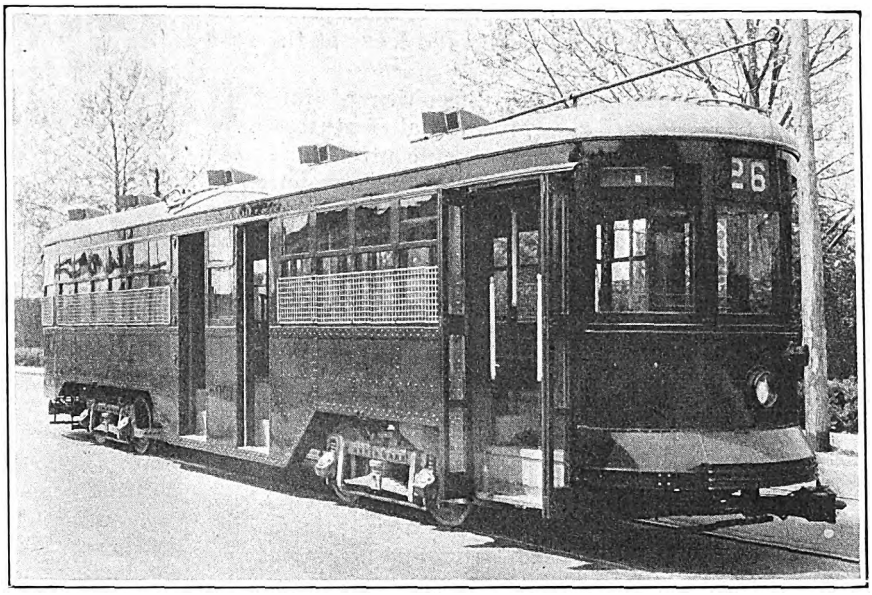
used on the two ends of the open car body. Thus the construction of two articulated trains provided sufficient vestibules for one permanently coupled train formed with two open car bodies. Similarly the two inner trucks from the pair of semi-convertible cars were used under each of the old open cars. The cross seats removed from the leading body of each articulated unit were installed in one of the open cars.

Old GE-80 motors with which the semi-convertible cars were originally equipped were retired, and Westinghouse 306-CV4 motors were installed on both types of remodeled units. On the articulated units two motors are mounted on each of the end trucks. The center or pivot truck is a trailer. On the permanently coupled trains the same change was made from GE-80 motors to Westinghouse 306-CV4 and one motor was placed on each truck.



Multiple-Unit Peter Witt Car. When Operated as the Second Car of a Train Entrance and Exit Are by Center Doors

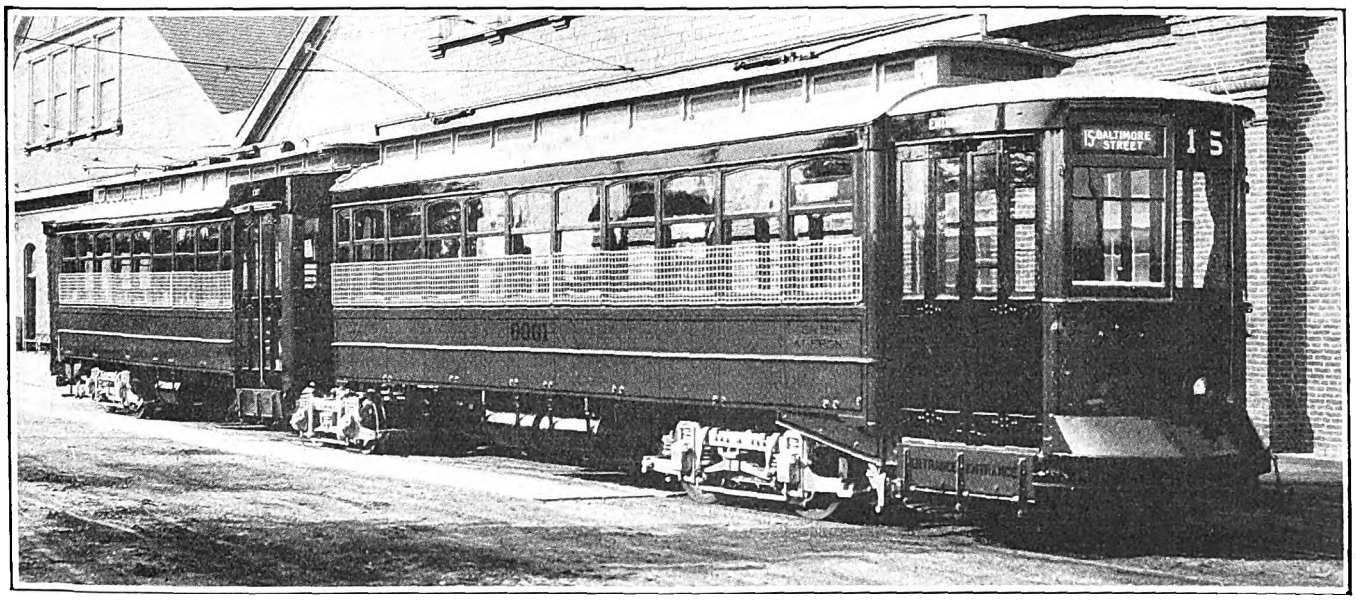
The idea of the permanently coupled two-car train did not originate with the remodeled open car construction. Previous to any consideration of such cars, it was decided to experiment with a permanently coupled two-car train, using closed cars which were the mates of the old twelve-bench open cars. These cars were small double-truck cars having a seating capacity of only 36 passengers, on longitudinal seats. They were hand-brake, two-motor cars, with old maximum traction type trucks.

Two cars of this lot were coupled together permanently, equipped with multiple-unit control and air brakes. The two center vestibules had to be lengthened to provide double doors for entrance or exit. This sample train was placed in service Nov. 24, 1924. While its operation has been entirely successful, it is doubtful if any more trains of the type will be built, as the expense involved very nearly offsets the saving effected through the elimination of one platform employee.

On both of these permanently coupled trains the leading car operates as a standard "pay-enter" car. Passengers board at the rear and leave at either the front or rear. On the rear car passengers board and leave at the front platform, paying fares on the "pay-enter" plan. Both types of permanently coupled trains are equipped for double-end operation.

Prior to the decision to use articulated units, the company considered the feasibility of operating Peter Witt multiple-unit trains. In the spring of 1923 an order was placed with the J. G. Brill Company for the construction of two sample Peter Witt cars, and an option was taken on 48 others, should the two sample cars prove successful.

These cars in many ways are a distinct departure from the railway's standard and also embody some features that are new to the Peter Witt design. They may be operated either as single cars or as two-car trains. Passengers enter through double doors on the front platform and leave by two separate doors at the center. The conductor is stationed between the two center doors and collects fares as passengers pass him, either to take seats in the rear half of the car or to alight from the forward half. When one of these cars is operated as the second car of a two-car train the same



The United Railways & Electric Company Is Building 110 Articulated Units of This Type

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method of fare collection is used, but all passengers enter at the forward center door and leave at the rear center door.

In order to overcome the difficulties of inflexible single-end operation, several unusual features were added to these cars. An emergency controller and air brake valve are placed beneath the rear semicircular seat under a removable center section. An emergency door has been provided at the left side of the front vestibule. This can be worked manually from an emergency conductor's station just inside the front platform, thus permitting operation of the car in the reverse direction.

These cars were placed in service on May 12, 1924, and proved to be very satisfactory operating singly. On Aug. 25, 1924, they were transferred to another line, where they could be used to advantage as a two-car train during rush hours. They have been operating on this line ever since, running as a train during the morning and evening rush hours and as single cars during the mid-day. Although they have been entirely successful, the company did not exercise its option on the other 48 cars, preferring to build articulated units.

CARHOUSE LOCATION AIDS TRAIN OPERATION

A factor that has had an important bearing on the use of trains in Baltimore is the arrangement of routes and carhouses. There are in all 34 routes and 22 carhouses. The former are laid out in such a way that in many cases one route furnishes short line service on another route. Carhouses are comparatively small. Their locations are such that a majority of the lines have carhouses near both ends. Ordinarily both carhouses on a single line are under the same supervisor. This makes it possible to haul the trailers in the morning in the direction of the rush and drop them at the carhouse at the other end of the line. In the afternoon this process is reversed.

On the Sparrows Point line, where the riding is exceptionally heavy, two motor cars haul a single trailer in the rush hours. The train commences its outbound trip with one trailer, and when passing a carhouse in the outskirts of the city picks up a third car. The fact that many of the workers in the steel plants which this line serves live in the vicinity of the carhouse insures a good load for the additional car. This three-car train operation is convenient also on summer Sundays and holidays, when large crowds are going back and forth between the city and the beaches.

Operation of a second short line over parts of a long route facilitate the use of the permanently coupled trains and the articulated units. Rush-hour traffic requires roughly 2½ times the number of cars operated during the day. During the afternoon rush it is customary to transfer all the single units operating on a long route to the short line using the same track. An equal number of articulated units or trains is then placed in service on the long route, thus providing double carrying capacity on both routes. When the rush is over the large units are taken off and the single units are transferred back.

The Department of Public Works, Detroit, is using one of the trolley supply cars of the Department of Street Railways to haul filling material. The supply car has been reconstructed to hold about 50 cu.yd. Five other cars will be fitted up in the same way.

Control Equipment Mounted Inside Baggage Cars

Two New Cars of the Michigan Electric Railway Are Arranged to Haul Trailing Loads of 1,050 Tons in Addition to Baggage Compartment Load

BY C. R. SEYBOLD
Westinghouse Electric & Manufacturing Company

TWO new baggage cars have recently been placed in service by the Michigan Electric Railway, Jackson, Mich. These were built especially for service on the company's southern division and they will be operated between Jackson and Kalamazoo. The mechanical equipment for the cars was manufactured by the J. G. Brill Company and the electrical equipment by the Westinghouse Electric & Manufacturing Company. The cars were built by the Michigan Electric Railway in its shops at Albion, Mich., and the electrical equipment was installed by the regular shop forces of the railway company.

Engineers of the Michigan Electric Railway adopted an unusual scheme for mounting the control apparatus. Instead of the usual under-floor arrangement, this apparatus, including grid resistors, is mounted inside the car. A steel frame extending crosswise at one end of the car serves as an equipment support. This frame is 5 ft. 3 in. wide, 6 ft. high and extends 2 ft. 3 in. lengthwise of the car. A wooden partition separates the equipment and motorman's compartment from the baggage compartment. The neatness and compactness of the arrangement are shown in the accompanying illustration.

The grid resistors are located at the bottom of the frame near the floor. Directly above are mounted the two switch boxes, each containing eight Westinghouse pneumatic unit switches, arranged to give sixteen notches, including tapped field running points. The reverser, fuse box, motor cutout switches and overload relay are located at the side of the groups. The main knife switch, control resistor, lightning arrester, junction box and feed valve for air control are placed on the frame in readily accessible positions. Master controllers are provided in the cabs at either end of the car so as to permit of double-end operation.

The railway expects to obtain a number of advantages from this layout which will result in decreased maintenance and depreciation charges in the coming years. Apparatus mounted on the inside is free from wheel wash and road dirt. The deteriorative effects of weather are also minimized and all parts are accessible for inspection and maintenance. The total space taken up by this equipment is 78 cu.ft. This is less than 3 per cent of the total cubic space in the car available for baggage or express.

The baggage cars are equipped with Westinghouse type 562-A slow speed motors geared 17:60 to 37-in. wheels. Helical gears are used. Each motor develops 100 hp. at 600 volts. The slow-speed characteristics of this motor permit heavy loads to be hauled without undue load on the substation equipment. Smooth acceleration is obtained by the use of the sixteen-notch control.

The total weight of the new cars is 73,350 lb. Distribution of this weight among the different parts is shown in the following table:

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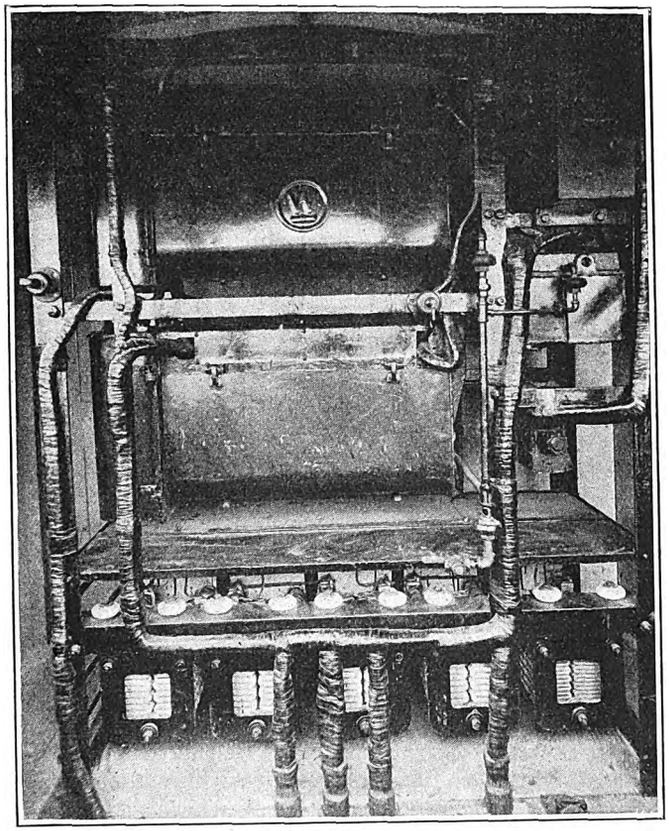


Arrangement of Control Equipment Inside Car

Electrical equipment	23,000
Trucks, J. G. Brill M. C. B.	23,000
Air brakes, Westinghouse WD-3-F	3,100
Heaters	250
Car body	24,000

The cars contain 2,084 cu.ft. of baggage space and have capacity for carrying a load of 50,000 lb.

Since both third rail and overhead trolley are used on the southern division, it is necessary to have both trolley poles and third rail shoes. Main cable is brought from these current collectors to the jaws of a single-pole, double-throw switch. This is operated manually by the motorman to accomplish changeover.

These cars will develop sufficient tractive effort to haul considerable trailing load with relatively low current demands. When the baggage compartment is loaded to capacity they will start and accelerate a trailing load of 1,050 tons on a straight and level track, assuming 25 per cent adhesion, without excessive strain on the motors. Under similar conditions, with 600 volts on the trolley, a speed of 13.5 m.p.h. can be reached with this load.

Treatment of Burns

The Most Frequent Causes of Burns on a Public Utility Property Are Enumerated, and Helpful Suggestions Are Given About Each

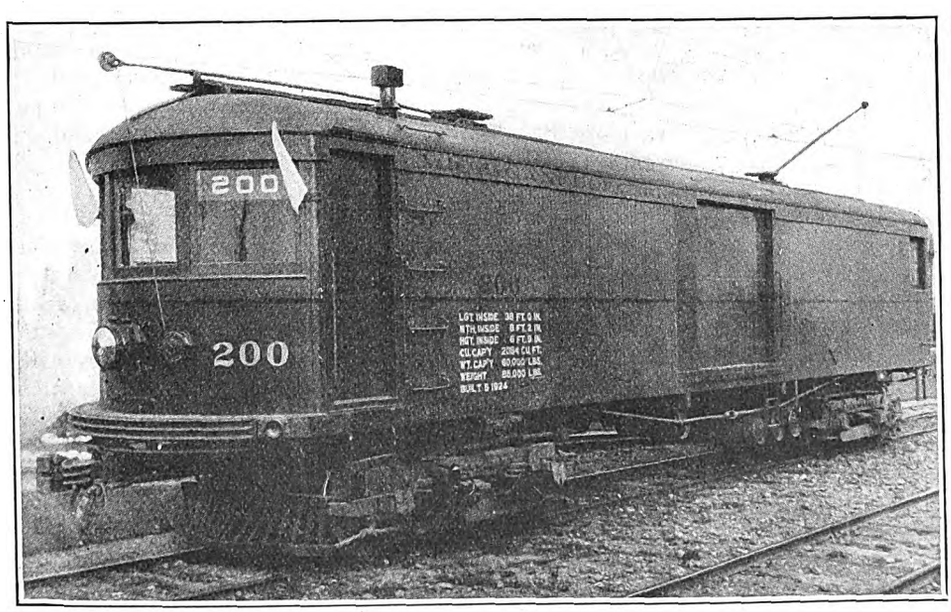
BY J. J. WYMER, M.D.
Surgeon New Orleans Public Service, Inc.

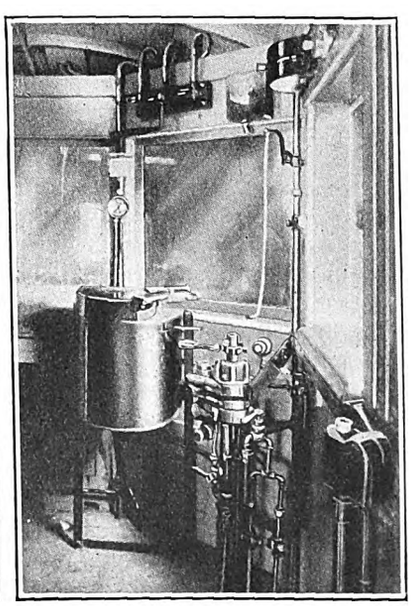
ONE of the most frequent types of injuries which confront the surgeon of a large electric railway or other public utility corporation is that of burns. There are so many causes that hardly a week passes but some employees will present themselves to the medical department for treatment for burns. I will attempt briefly to consider all of the types that I have most frequently met and will treat them under three distinct headings: (a) The causative agent, (b) the anatomical parts involved, and (c) the extent of destruction of tissues.

Burns may be caused by chemicals, fire, steam or hot water, hot or molten metals, heat rays as from the sun or X-ray, welding and other machines, brush burns, and electric flash or contact with charged wires. The parts involved may be the entire body, or may be limited to any member.

To permit a wide degree of differentiation I have adopted a classification of six degrees of extent of burns as follows:

1. Simple redness or erythema.
2. Involving the superficial layers of the integument down to corium and associated with blisters.
3. Involving all the true skin and down to the muscles and associated with large blisters.
4. Destruction of all the tissues involving the muscles.
5. Destruction of the tissues down to and involving the bone.
6. Total destruction of the member (charring).





At Left, New Baggage Car of Michigan Electric Railway with Control Equipment Mounted Inside. At Right, Operating End of Car

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The following is suggested treatment for each of the kinds of burns enumerated:

Chemical Burns—Those most frequently met with are the result of acids and alkalies such as muriatic, nitric and sulphuric acids and caustic potash or soda (lye). They are found in garages where the testing and filling of batteries for autos is done, and in the meter repair rooms where old meters are cleaned during the process of repair.

As a rule these wounds involve the eye and face and occasionally the hands, and for the most part they are of the first degree. The burn may be limited as the result of prompt counteraction by another worker with a neutralizing agent which should always be kept near at hand. These wounds will result in a disability of from three to five days and are serious only where first-aid treatment has not been available.

Fire Burns—These usually result in the power station (or in the manufacturing department of a gas company) and are the result of explosion of gas in the gas generators or back fires in front of the firedoors of a steam boiler. Electric flashes also cause this type of burn, but I will take these up under the subject of electric burns. One great danger from fire burns is the possibility of clothing catching fire and the victim fanning the blaze in an attempt to get to someone who can assist him. If the clothing is not ignited, the burns will be limited to the exposed areas, such as the hands and face, and they rarely go beyond the third degree. Should the clothing catch fire and the trunk be burned, even though in a minor degree, caution should be used in giving a prognosis due to possible complications such as pneumonia, inflammations of the stomach and intestines, occasionally resulting in ulcers or acute nephritis (Bright's disease). These may be caused either from the elimination of the poisons or damage of the organs themselves and acute inflammation, and any one may terminate the case fatally, even though the injury at the beginning did not appear to be bad.

Minor fire burns may result from acetylene gas welding machines, explosions during the installation of gas meters, the stripping of gas meters during the process of repair, or the explosion of gasoline furnaces. The eyes appear to be the most frequent of all organs injured. The hands and face come next. The period of disability from these burns will extend from one day to three weeks.

Steam and Hot Water—Burns from this cause are usually of various degrees in the same individual and will run the gamut from simple erythema to death. The degree of the burn will depend on the time of the exposure. For instance, in the breaking of a high-pressure steam pipe, the victim may be caught in a trap, in which event he will be rendered unconscious and in a very short time will receive fatal burns. In another instance he may be able to get away with a superficial burn only. It must be borne in mind that this type of burn will frequently involve large areas, and even though superficial a very guarded prognosis should be given, as burns involving two-thirds of the body, even when of the first degree, may prove fatal. When a limited area is involved the disability will be from one to three weeks.

Hot and Molten Metals—The burns resulting from hot or molten metals are always deep and frequently are of the fifth degree. Most of the cases met with in my work are from hot solder, flying pieces of iron in the blacksmith shop and small ends of a welder's "stick."

These burns are generally about the feet, and the metal falling into the shoe results in a very deep burn before the victim is able to get the shoe off. Little or no bleeding results while the hot metal burns its way deep into the tissues. As a result, these burns are very painful, often requiring opiates. They are very sluggish in repair and frequently require treatment for five or more weeks.

In foundries and smelters, the wounds caused by these burns are frequently so extensive as to cause loss of life or limb.

Heat Rays—The burns resulting from heat rays are for the most part never beyond the third degree and will not cause disability.

Brush Burns—This is a term used to describe certain types of injuries resulting from a fall, the skin being scraped off from contact with a rough surface. While they are very painful at first, unless infection complicates the injury there is no disability, even though large areas are involved, and the patient makes a speedy recovery.

Electric Burns—This type of burn is the most deceptive with which I have had to deal. In my experience I have to differ with some authorities who believe that the extent of the burn depends on the duration of the contact and the voltage of the wire where the contact is made. I have seen many cases where individuals burned by 2,300 volts suffer only slight lesions, while others, under similar conditions, get very extensive ones. I quote from Moorehead: "An electric burn is an index of resistance of the tissue affected, and always indicates that the full strength of the current has not been received." In this I cannot agree with Dr. Moorehead, as I have seen very severe burns where the patient succumbed to electric shock, and others where the leg and hand would become gangrenous 12 in. above the point of contact and recover. It is also true that I have seen fatal cases with only slight evidence of contact, and it was only by careful search that I was able to discover a burn at all.

The electric burn is not nearly as painful at the beginning as the other types, and I have not been as successful in getting rapid responses to treatment as is claimed by some authors. Granulation has always been sluggish regardless of the treatment and frequently had to be stimulated and assisted for many days. One noticeable feature is the smoothness of the scar as well as its pliability. Contractures are not so marked, and the patients often get nearly complete restoration of function even in the deep types.

TREATMENT

No attempt will be made here to enter into the treatment as every textbook on surgery carries a complete chapter on the subject, but I cannot refrain from expressing a few words on the first aid. Every first-aid kit should be equipped with a lubricant. Personally I prefer plain or borated vaseline in sealed collapsible tubes. Every case, regardless of how slight it is, should be treated with this dressing and referred to the medical department for anti-tetanic serum. Ambrine presents one of the safest, least painful and most easily applied of all dressings in the surgeon's office. I never wash a burn, but will clean the tissues in the proximity, removing grease, etc., with benzine and alcohol. I never use iodine on a burn.

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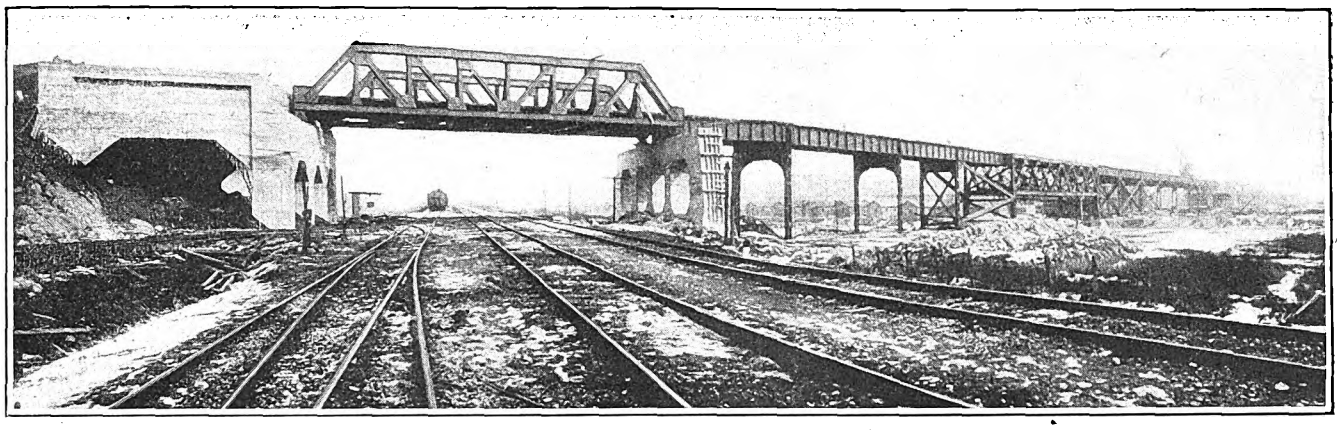


1,000 Ft. of Bridge Work, Reaching a Maximum Elevation of 38 Ft. Above the Surrounding Surface Level, Is Employed to Cross the Sanitary District Channel and the Various Railroad and Street Crossings at This Location

North Shore Line Completes $3,000,000 Extension

The Route from Howard Street to Niles Center Includes a Wide Variety of Construction, Including Open Cut, Earth Fill, Overhead Bridge and Surface Track—Trains Are Being Operated Temporarily by Chicago Rapid Transit Company

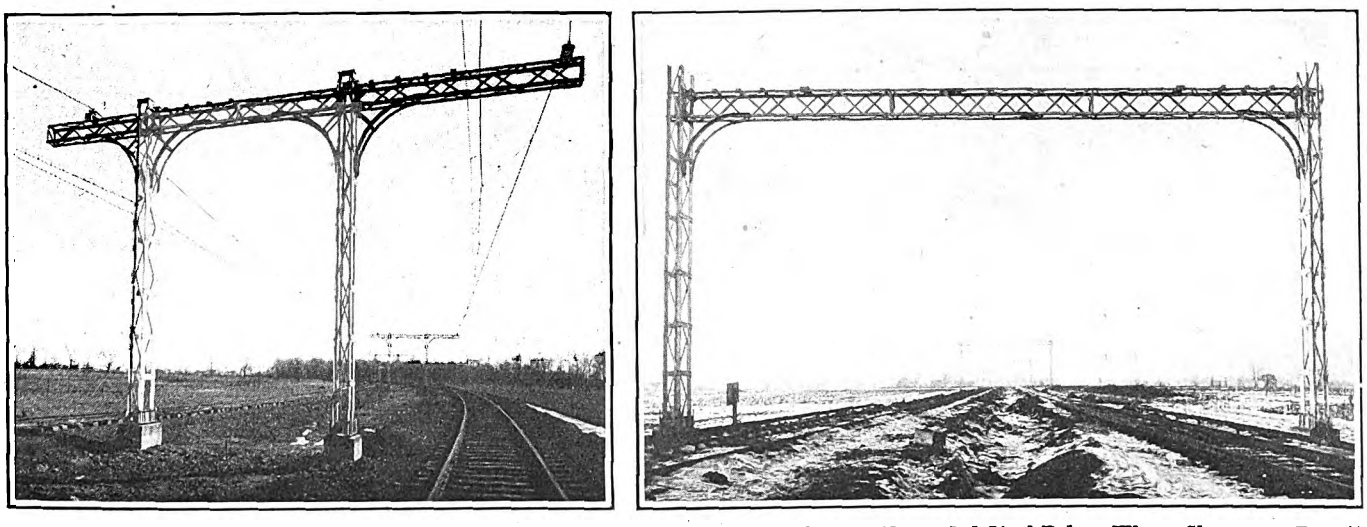
REGULAR service was opened on a new 5-mile extension by the Chicago Rapid Transit Company on March 28, following inaugural ceremonies at the terminal. Three special trains of company, city and village officials and business men's organizations were operated over the line previous to the opening. Airplanes, aerial bombs and other innovations thrilled the crowd of more than 2,000 persons.

Among those who talked at the opening were R. F. Clinch, vice-president of the Rapid Transit Company, who represented Samuel Insull, chairman, and Britton I. Budd, president; B. J. Fallon, vice-president in charge of operation, and C. E. Thompson, assistant to the president Chicago, North Shore & Milwaukee Railroad.

L. E. Myers, head of the construction company which built the new line; United States Representative Carl R. Chindblom, Congressman Tenth District, Illinois, and Mayors Harry Pearsons and John Brown of Evanston and Niles Center, respectively, the towns served, were also among the speakers of the occasion.

The first trial train was operated from the intersection with the present line at Howard Street to the Dempster Street terminal in Niles Center on Feb. 1. As outlined in the July 26, 1924, issue of ELECTRIC RAILWAY JOURNAL, this is the initial step in the construction of a new high-speed cutoff through the Skokie Valley to Waukegan. The article referred to included a map of the new line.

Construction designed for passenger service at high speed is a feature of the new line. It consists of a combination of open cut, permanent earth fill, open bridge work and surface construction. Stations are located on each of these sections. All of them are of



Heavy Overhead Catenary Construction Is Carried on Steel Towers Built Up of Bates Expanded Steel Poles. Where Clearances Permit, These Towers Are of Simple Overhead Bridge Type. At Other Locations the Supporting Columns Are Between the Tracks

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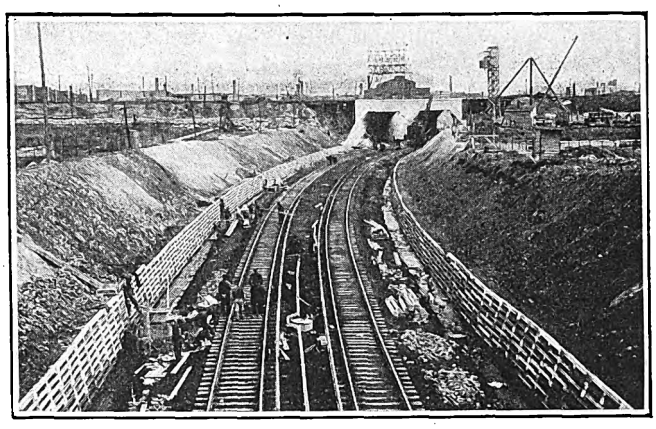
permanent decorative brick construction, ingeniously adapted to the individual grade conditions, and of a type of architecture in keeping with the general high-grade character of the entire development and with the reputation which the North Shore Line has established in the communities which it serves.

Some of the engineering and drainage problems which were involved in laying out the route were described in detail in the previous article. The method in which some of these conditions were treated is shown in various accompanying illustrations.

At Asbury Avenue and Ridge Avenue in Evanston the track is in open cut construction, passing under decorative concrete bridges at these streets. Similar stations at these two locations are arranged so that the buildings are on a level with the street, and straddle the two initial tracks below. Inclosed stairways lead to the loading platforms on the track level. Canopies extending from the building cover these platforms. It will be noted that the bridge abutments have been spaced wide enough to allow clearance for an additional track on the outside of each of the loading platforms, so as to make a four-track railroad when the new line is entirely completed. An interior view of the Ridge Avenue station shows the high-grade character of these buildings and the spacious accommodations provided for entering passengers. Another interior view shows the Dempster Street station, which for the time being will be the terminal of the line. Various concessions, including restaurant, news-stand, etc., will be located in this station.

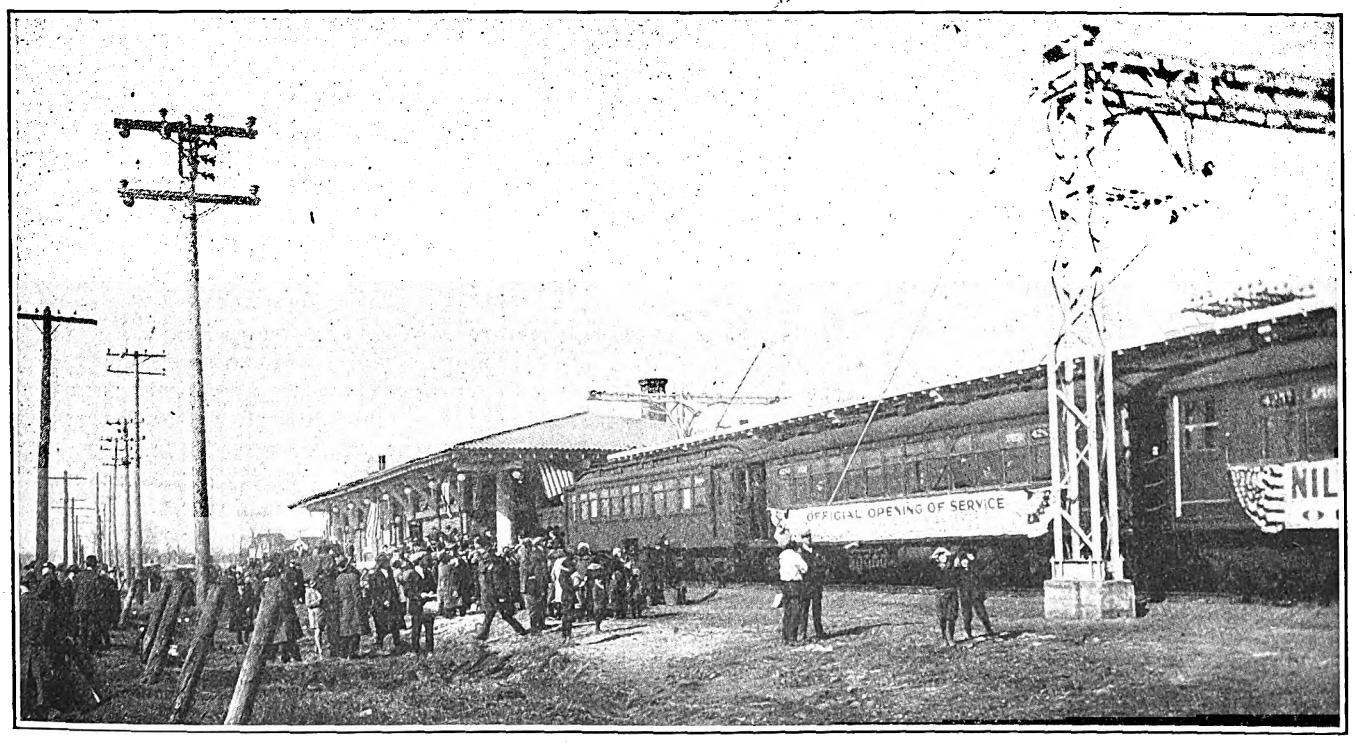
A typical station where tracks are on the surface is illustrated at Schreiber Road. The building is of pressed brick with tile roof, and the platform canopy is supported on large diameter pillars, giving a pergola effect. The elevated loading platform at Dodge Avenue, where the tracks are elevated above the cross street, is shown in another illustration. Here the station building is below the right-of-way pictured.



A Typical View of the Open Cut Construction of the New Line

Across the North Shore drainage channel and the Mayfair cutoff of the Chicago & Northwestern Railroad the tracks reach an elevation of 38 ft. above the natural ground level. This elevation was adopted in order to get legal clearances over the steam railroad, which also is elevated at this point. The conditions presented by this joint crossing of railroad and canal were further complicated by the necessity for providing spans for two future streets to be opened in this vicinity and for the new McCormick highway under construction by the Sanitary District. This combination of conditions led to the construction of approximately 1,000 ft. of continuous heavy steel bridgework. An accompanying illustration shows the appearance of this structure.

The electrical distribution system is of a new heavy type catenary construction designed to handle long trains at high speed. The primary messenger is made up of a composite strand consisting of a "copper weld" core and an outer layer of pure copper. Its diameter is 1.02 in., and it has a copper equivalent of 580,000 circ.mil. A copper feeder messenger below, which has



One of the Special Trains Run March 28 at the Inaugural of the Niles Center Extension of the North Shore Line. The Station Is Dempster Street, the New Terminal

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a cross-section of 500,000 cir.mil, in turn supports the No. 0000 high-strength bronze trolley wire.

The overhead system is carried on fabricated towers built up with Bates expanded steel poles. These towers are spaced on 250-ft. and 300-ft. centers. All members are galvanized by the hot dip process. An article describing this overhead construction in detail will be published in a subsequent issue.

One Westinghouse automatic substation, with a single 2,000-kw. synchronous converter, is located 4½ miles from the Howard Street junction with the present main line. The Howard Street end of the line is fed from the present Calvary station of the Commonwealth Edison Company.

In order to comply with promises made to the officials of Evanston and Niles Center to have the line ready for operation on Feb. 1, it was necessary to carry on most of the heavy construction work under extreme winter weather conditions. Even with this handicap, the first train was operated on the date specified in the original agreement. For the time being the new line will be operated by the Chicago Rapid Transit Company under a lease arrangement, so as to give local transportation service to the new communities that are expected to develop rapidly along the new line.

The Readers' Forum

Comment on the St. Louis Street Railway-Motor Bus Situation

C. E. SMITH & COMPANY
Consulting Engineers

ST. LOUIS, MO., April 1, 1925.

To the Editor:

The analysis of the St. Louis street railway-motor bus situation by Mr. Buck and Mr. Stocks in the ELECTRIC RAILWAY JOURNAL for March 14 is such a complete, clear, unbiased statement of fact that little remains to be said; it was unnecessary to draw conclusions. They are obvious and self-evident.

In addition to picturing the St. Louis situation they picture as well the situation that may be expected in any large city under similar circumstances and conditions, and it may not be out of place to summarize briefly some of those conditions.

There is a very definite demand for motor bus service in addition to street railway service in districts adequately served by street railway lines as well as in intermediate and outlying districts not so served. This demand comes from those who have no automobiles and enjoy this opportunity to ride in an automobile at small cost; those who, particularly women, prefer not to drive their own automobiles through the congested districts and will not ride crowded street cars but will ride the buses; those who prefer to ride on a conveyance on which they will not be compelled to stand nor be embarrassed by other standees; those to whom the bus line may be a little closer and more convenient; and a small element of the riding public who have developed such animosity toward street car service that they welcome the opportunity to patronize a competitor.

It has long been my opinion that these various classes and any others who desire to pay more for a different class of transportation service, whether better or not, should be provided with that transportation to the extent to which it can be provided at the price they desire to pay for it, but that it should be established as a co-ordinated branch of the street railway service and not in competition with it. If co-ordinated it will be possible to work out a balance of service and an equitable transfer arrangement between the buses and the street cars, so that people may be transported for a single fare between points served by buses and points served by street railways, which is not possible when operated in competition without transfer privileges between separate companies.

On the other hand, it is surprising what a large element of the population, even including men of large affairs and big business, believe that competition in city transportation is beneficial and tends to reduce costs. Of course, it is axiomatic that to the extent to which competition brings about unnecessary duplication of service the costs will be increased, and the inevitable result will be an increased street car fare.

In every city there are certain street car lines that carry the cream of the traffic and are profitable. There are other lines that are unprofitable, but they are necessary in the whole transportation picture and must be operated, the loss being made up by the profits on the heavy traffic lines that carry the cream of the traffic. Motor buses cannot profitably serve those districts served by street cars that are operated at a loss. Motor buses can be operated profitably only in those districts where street cars carry the heavy traffic. When buses are operated as a parasite on the street railway system, reducing the profits on the profitable lines, the ability of the latter to carry the unprofitable street car lines is reduced to such an extent that fares must be increased over the entire street railway system.

There is a sociological question involved in the difference between a 7-cent fare and a 10-cent fare. The difference between these two rates means an average increase for transportation of about $50 per year per family. No doubt in any community 5 or 10 per cent of the families can easily absorb such increase, but I firmly believe that the great multitude of the families in any large city cannot contemplate or undertake with equanimity an increase of $50 in the family budget; to avoid that the cheaper means of mass transportation by street cars in the larger cities must be continued in full vigor and at the least cost. This cannot be done if they be subjected to unregulated competition of favored, subsidized motor bus lines.

The extent to which motor buses in St. Louis have been favored and subsidized is indicated by the fact that they are permitted to charge a 10-cent fare while the street railways are limited to a 7-cent fare; the street railway company contributes to the city somewhat more than 10 per cent of its gross revenues in various forms of taxation and paving costs, the motor bus company approximately 4 per cent; the motor bus company is not compelled to provide any particular quantity of service during the rush hours, but is permitted to choose the number of passengers for which it is willing to provide seats; the street railway is compelled to provide a fixed number of seats and a fixed area of standing room for all the passengers and carries the burden; the motor buses wear out pavements provided by others; the street car company pays for pavements used by others.

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Contrary to the general understanding, motor buses in St. Louis do not provide faster transportation; two or three minutes saved per trip is offset by longer delays waiting for buses with an average loss by bus of five minutes per trip. They are noisy, smell oily, ride so roughly that newspapers may not be read, are irregular in operation, add to the congestion and delay all other traffic in the congested districts.

St. Louis was considerably overbuilt with street car lines in former years, and except to a very slight extent here and there no extensions were necessary. An increase in the company's investment of approximately 2 per cent for extensions would have satisfied that demand at any time and the company is properly subjected to very severe criticism for failing to provide and perform on such extensions the transportation service for which it had accepted a franchise. Under such conditions it is inevitable that competitive agencies of transportation may be expected not only to serve such unserved territories, but also to serve areas already served.

Although the first St. Louis bus lines served districts that have the best street railway service in the city, later service to outlying areas not previously served gave the bus company its firmest support for competition in St. Louis. Under the guise of serving small areas not previously served, rights were secured for most of the motor bus lines, 90 per cent of which operate either on streets having street car tracks or closely adjacent thereto. The original motor bus lines paralleling the heaviest street railway lines were profitable, but the later lines 7 to 8 miles long have changed the picture somewhat, as they are not as profitable as the original lines. There is very little short riding and apparently but little induced riding. Off-peak travel is light on all bus lines; during rush hours all seats are taken, but a seat is not provided for every one who would be a passenger.

The bus company cannot afford to provide enough equipment to carry all the business that would present itself during the short sharp peak morning and evening, and have the equipment and employees idle during the remainder of the day, but goes through the rush hours with only slightly increased service, while the street railway company must furnish seats and standing room for all. Thus, with the street railway as a stand-by to provide the costly service that has a low load factor, the buses have an opportunity of providing just enough service to get the highest load factor.

At one point in the city beyond the end of a street car line competitive motor buses are operated on the same street in the interest of the street railway company and also by its competitor. The competition bus service offers direct rides in and out of the business district and a certain measure of city-wide transfer service over bus lines. The street car company's buses exchange transfers with the street car lines (10 cents combined ride). On this street a clear picture is available of the preference of the people for the buses unified with the street railway system, since five times as many ride the street railway company's buses as the competitive buses.

It is futile to comment on means by which special privileges were secured from city officials by the motor bus company here. Suffice it to say that the officials who granted the rights justified their actions with strong support from those who desired the competitive service. Apparently that does not exceed 5 per cent of the riding public, but when operated as in St. Louis and other large cities even to that extent there must inevitably be decreased street car service or reduced wages or increased car fares to the 95 per cent who ride the street cars, or possibly a combination of those evils, and possibly ultimate purchase of the motor bus lines by the street railway company when the people demand co-ordination of service, as they have always done in the past where there have been separate competing unco-ordinated transportation agencies.

To avoid the repetition of past evils it behooves the people to see that motor bus companies, established as the one in St. Louis has been, do not secure special privileges in the way of high fares, low taxes, relief from regulation, pre-emptive rights or other special privileges to such an extent as to give them a considerable nuisance value at time of consolidation. In the long run it is not the street railway company that gets hurt but the car rider and the merchant.

C. E. SMITH,
Consulting Engineer Department of Public Utilities, City of St. Louis.

American Association News

Way Matters

CONSIDERABLE progress in the investigation of the various subjects assigned to sub-committees was shown in the reports presented at a meeting of the committee on way matters held at association headquarters in New York on April 1 and 2. In the matter of the review of existing standards the sub-committee suggested certain changes in the standard rail specifications and the specifications covering the manufacture of special trackwork. Efforts are being made to bring these specifications into harmony with the views of a committee of the American Railway Association. Suggested changes in the special trackwork specifications were referred back to the sub-committee with instructions to consult the manufacturers and report at the next meeting. A lively discussion took place regarding the permissible tolerances in punched tie rod holes. Nothing has yet been done concerning additions or corrections to the drawings in the manual.

To secure the opinion of the whole committee, the sub-committee on standardization of frogs and switches presented two designs of lug fastenings for switch tongues and described the merits and demerits of each type. A poll of the railway members indicated that opinion favored the same design which had been favored by the sub-committee.

A comprehensive report regarding the status of tests and research work in connection with welded rail joints was made by W. W. Wysor. He stated that the third progress report of this committee would soon be ready for distribution. Arrangements are now being made to publish this report and distribute it to the railway industry. An offer received from the General Electric Company to proceed at its own expense with the "educated tie" tests of rail joints in various stages of defectiveness was discussed. The committee considered this a good method of collecting data on the subject of rail joints and expressed the hope that the company would continue with the test.

Results obtained with the *in situ* process of surface hardening rails in Toronto were described by A. T. Spencer. His report was accompanied by photographs showing the appearance of rails after several years of service. Additional data on this subject are expected to be obtained in the near future from the Boston Elevated Railway and the United Railways & Electric Company of Baltimore.

More co-operation from the railway members was asked in connection with the investigation of welding rod speci-

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fications. A questionnaire has been prepared and will soon be sent out to member companies. To enable the railways to use the information contained in the final report of the committee on way matters, it will be necessary to include practical data useful in directing and educating welders. It is hoped to secure this information from a number of railways before the report of the committee goes to press.

Slow progress is being made by the sub-committee on design of substitute ties. Questionnaires prepared at a meeting of the way committee in Cleveland on Jan. 22 were sent out on March 16, and 25 replies had been received prior to the New York meeting. Efforts will be made to follow up this matter and secure information from those companies which have not yet answered.

Responsibility for noise in car operation was thought by the sub-committee in charge of investigating this subject to be divided between the car and the track structure. Reduction of noise is 90 per cent a matter of maintenance and only about 10 per cent dependent upon the type of track construction, the committee believes. The committee suggested that this matter be taken up with the Bureau of Standards at Washington with a view to securing its assistance and possibly the use of instruments for measuring the volume of noise.

The sub-committee on design of limit of wear gage, wheel mounting, etc., reported that a meeting had been held on Jan. 29 in conjunction with a similar sub-committee of the equipment committee. This resulted in the making of several suggestions which are now being considered by the latter. The way committee requested its chairman to take up this matter and see if definite action could not be secured from the equipment committee. It was decided to recommend that in addition to the gage requirements definite maximum and minimum measurements back to back of wheels taken at the level of the wheel tread, should be specified and that wheels be removed from service when they do not conform to these requirements.

Reports were submitted by sub-committees on design of steam railroad crossings and of plain girder rails. Tentative designs were submitted covering three weights of 7-in. rail as prepared by the sectional committee of the A.E.S.C. and also some alternative designs suggested by E. M. T. Ryder. An expression of opinion was asked from the railway members, particularly with reference to the depth of head and retaining a fishing section in conformity with former association standards. The committee discussed the matter and it was agreed that the fishing section should be sacrificed if necessary in order to secure greater depth of rail head. It was thought undesirable to retain the present fishing section by increasing the depth of the rail section in order to give greater depth to the rail head.

A lively discussion occurred as to whether the next meeting of the committee should be held at French Lick Springs, Ind., or at Montreal. It was finally decided that the chairman should arrange for a letter ballot in order to give the absent members opportunity to express their views on this matter. Those present at the meeting were: E. M. T. Ryder, C. F. Gailor, V. Angerer, T. A. Ferneding, S. C. Baker, H. E. Bean, H. H. Dartt, E. B. Entwisle, R. B. Fisher, D. J. Graham, H. C. Heaton, N. M. Hench, M. M. Johnston, T. J. Lavan, E. L. Lockman, H. F. Merker, L. A. Mitchell, O. C. Rehfuss, A. T. Spencer, J. B. Tinnon, W. W. Wysor, and H. H. George, chairman.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 16—Wisconsin Utilities Association, Hotel Pfister, Milwaukee, Wis.

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Texas.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 26-27—Regional Motor Transport Conference, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

News of Other Associations

Wisconsin Convention April 16

THE program for the annual convention of the Wisconsin Utilities Association to be held on April 16 at the Hotel Pfister, Milwaukee, has been announced by Secretary John N. Cadby.

In addition to the annual address by President G. C. Neff, and reports from various standing committees, the program will include the following subjects:

"Some Recent Legal Phases of Regulation," by Lewis E. Gettle, chairman Wisconsin Railroad Commission.

"By Our Achievements We Must Justify Public Confidence," by Marshall E. Sampsell, Wisconsin Power & Light Company.

"Some Recent Developments of Public Utility Financing," by George E. Frazer of Frazer and Torbet, Chicago.

B. W. Arnold, manager motor coach division Chicago, North Shore & Milwaukee Railroad, is chairman of the entertainment committee. At the banquet to be held in the evening a musical program has been arranged to enliven the occasion. Harry F. Atwood, president of the Constitution Anniversary Association, Chicago, will deliver an address on the federal constitution.

Entertainment has also been provided for the women in attendance during the convention. This program has been in charge of Mrs. G. Post of Milwaukee, and will include a luncheon in the Fern Room of the Pfister Hotel and a bridge party during the afternoon.

Pipe Flanges and Fittings

THE sectional committee of the American Engineering Standards Committee dealing with the standardization of pipe flanges and fittings has approved a number of important standards applying to malleable-iron and cast-iron screw fittings. These will now be submitted for approval to the sponsor organizations, which are the American Society of Mechanical Engineers, the Manufacturers Standardization Society of the Valve and Fitting Industry and the Heating and Piping Contractors National Association.

Transportation Studies at Technical Schools

TRANSPORTATION at technical schools will be discussed in an address by Prof. Winthrop M. Daniels of Yale University, at a meeting of the New York Railroad Club to be held on April 17. The full title of the address to be presented is as follows: "What Branches of Transportation Should Technical Schools and Universities Attempt to Teach?"

Chicago Motor Transport Conference

"CO-ORDINATED Transportation" will be the theme of a regional motor transport conference to be held under arrangements made by the National Automobile Chamber of Commerce at Chicago on Tuesday and Wednesday, May 26 and 27.

Among the speakers will be leading automobile, railroad, trolley and shipping executives from Chicago and the Middle West. The program will be similar to that of the New England Motor Transport Conference held at Boston on Dec. 8-9, 1924.

Besides discussion of the place of the motor truck and motor bus in short-haul transportation, there will be statements from varying points of view upon the wisdom of federal regulation of common carrier vehicles, a subject which has become of unusual importance since recent decisions of the U. S. Supreme Court indicating that such motor vehicles are not subject to state regulation.

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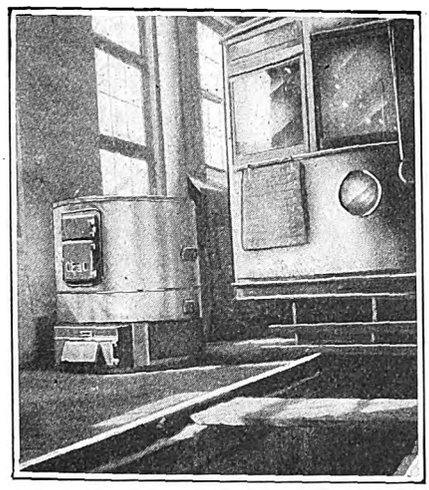
Maintenance of Equipment

Pipeless Furnace Keeps Car Shops Warm

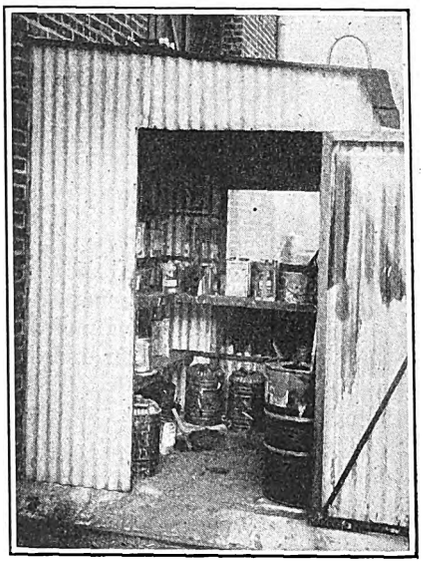
ONE of the problems which faced the management when operation was resumed on the New Haven & Shore Line Railway in 1923 was that of heating the car repair shops at Guilford. In the days of the predecessor company which operated this line until 1919, the repair shops were at Saybrook and the barn at Guilford was used only for storage purposes. On account of its location midway between the two ends of the line the Guilford structure was preferred by the new management as the location for doing maintenance and repair work. The heating problem was successfully solved by the installation of a Kelsey pipeless furnace, as shown in the accompanying illustration. This was done at a much lower cost than would have been required to install a steam-heating plant in this concrete building and has proved entirely satisfactory during the most severe winter weather.



A Pipeless Furnace Was Installed at Small Expense When This Carhouse Was Converted into a Repair Shop

Open Paint Storage Outside Shop

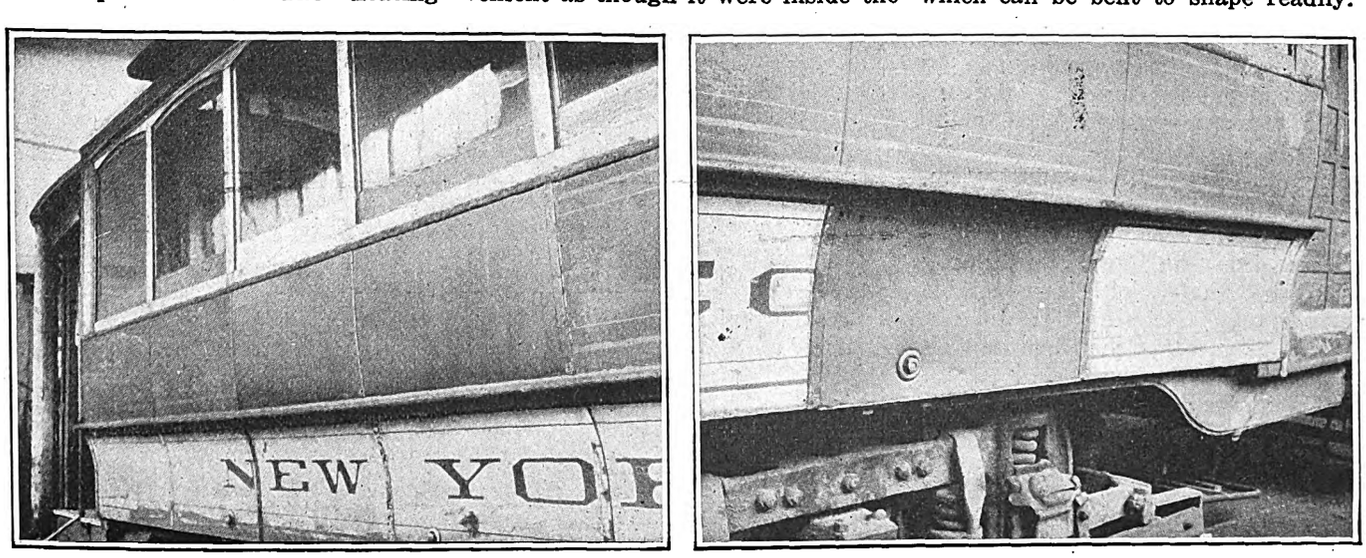
THE problem of providing a convenient fireproof storage for paints after the containers have been opened and they are in use has been solved in an effective manner at the 155th Street shop of the Eighth Avenue Railroad, New York City. A corrugated iron building 6 ft. x 6 ft. x 8 ft. high, with concrete floor, has been constructed just outside the paint shop and adjacent to the doorway. This building is provided with shelves for the storage of open paint and also has a bench around two sides for convenience in mixing paints. A window is provided in one side opposite the doorway so that during inclement weather the door may be kept closed and the interior still be efficiently lighted. During cold weather the building is heated by two electric heaters provided with Railway Utility Company's thermostatic control. This arrangement provides paint storage just as convenient as though it were inside the paint shop and at the same time removes the paints and oils from close proximity to cars.



Corrugated Iron Building Used for Open Paint Sotrage at the Eighth Avenue Railroad Shop

Repairing Car Panels with Sheet Steel

REPAIRS to car panels which have been damaged in accidents are made in the 155th Street shops of the New York & Harlem Railroad through the use of sheet steel. This method has been found much cheaper and consumes much less time in making repairs than the use of wood panels. No. 16 gage steel is used, which can be bent to shape readily.



Sheet Steel Is Used for Repairs to Upper and Lower Side Panels on the Eighth Avenue Railway's Cars

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Where panels are split or otherwise damaged, the sheet is superimposed on the damaged parts.

In applying the sheets the Eighth Avenue Railway paints the material on the inside before it is applied. This gives the necessary protection against rust so as to minimize the danger of the panels deteriorating from rust starting on the inside. In painting the outside, the railway's standard method of painting is used. Very close inspection is required to detect the sheet steel paneling from the ordinary wooden structure previously used.

New Equipment Available

Narrow Drum Concrete Mixer

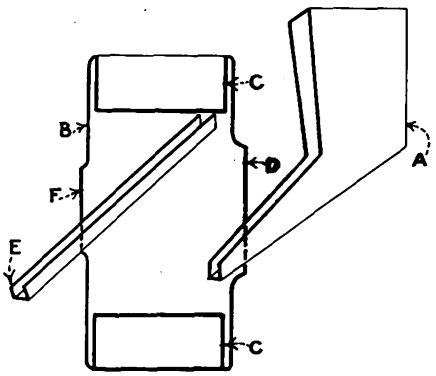
IMPORTANT saving in the time required for mixing concrete is the principal advantage claimed for a new, narrow drum mixer recently placed on the market by the Standard Scale & Supply Corporation, Pittsburgh, Pa. The charging hole has a diameter of 24 in. and the skip, when elevated, reaches such an angle that the charge drops almost vertically into the drum. The latter is deep enough to receive the entire charge in one shot, no part of the aggregate being held in the charging chute until the drum revolves.

To avoid the scattering of the load the walls of the drum were built close together, thus keeping the aggregate within the confines of a narrow space. When the drum is set in motion the buckets lift the aggregate up and with a scouring motion tumble it down again and again into one conglomerate mass. The aggregate need not be pushed from one side of the drum to the other, and it is claimed the mixture is completed in fewer revolutions of the drum than would otherwise be possible.

An 18-in. diameter discharge opening permits a wide discharge chute, the latter being just wide enough to have free movement in this opening. Because of the large opening and the narrow drum the chute can be tipped to a sharp angle, while the chute reaches near to the other side of the drum. As shown in the illustration, the far end of the chute is directly under the far end of the buckets. These drop the aggregate directly into the chute, with considerable momentum. Because of its momentum it is said that the concrete does not adhere to the chute.

This mixer is so built that the operator, without moving from his position, manipulates the power-loader lever, the discharge lever, and turns on the water for the mix. Through the 24-in. charging hole he can see into the drum and determine whether he has enough of each kind of material.

The mixer is very compact and can be easily transported from place to place. The front wheels pass under the frame, making short turns possible. Another feature is the interchangeability of the low charger and skip loader. If the user wishes to change from one to the other he can obtain a skip which is installed on the job, as holes have been drilled in the frame for attaching this equipment.

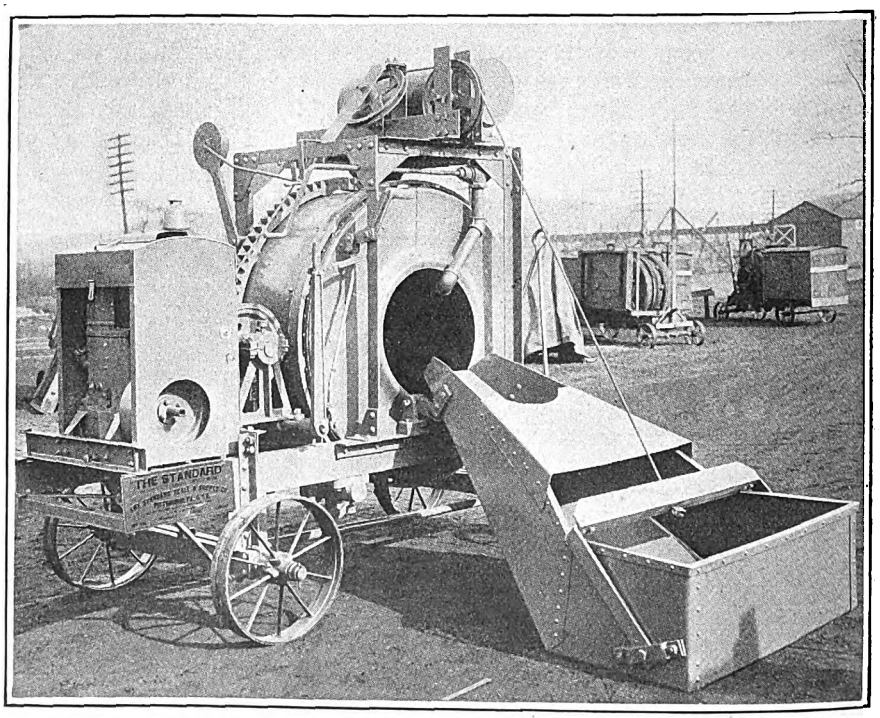


When Raised, the Skip Drops the Charge Almost Vertically into the Narrow Drum
A—Skip loader. *B*—Drum. *C*—Buckets. *D*—Charging hole. *E*—Discharge chute. *F*—Discharging hole.

Disconnecting Switches

IN A NEW line of disconnecting switches known as Type LG-17, now being marketed by the General Electric Company, Schenectady, N. Y., the cantilever strength of the insulator unit has been greatly increased by a double crimped cap and the addition of a pin cast integral with the lower fitting. Both hinge and contact clips are cast integral with their blocks; the blade of the switch, being in two sections, possesses much more lateral rigidity than would be the case if the blade were of a single piece, and the use of bolts through the two sections of the blade, above and below the clip, provides a convenient means of adjustment or readjustment of contact pressure.

All forms of the switch are furnished with a new type of latch or safety catch. On double-throw switches there is a latch at each end. The action of the latch is positive and combines both latching and opening features. A new switch hook is also included in the development, incorporating both a special "V" hook for the LG-17 and a standard hook for operating other forms of disconnecting switches and latches.



Without Moving from His Place the Operator of This Concrete Mixer Controls Loading and Discharging. The Wide Opening Allows Him to Examine this Condition of the Mixture

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The News of the Industry

Cleveland "Closed Shop" Void, Says Court of Appeals

On the grounds of public policy, the Court of Appeals, sitting in Cleveland, Ohio, has just decided unanimously that the closed shop agreement between the Cleveland Railway employees and the union is null and void. If the decision is not carried to the State Supreme Court, or is upheld by the State Supreme Court if carried there by the union, it means that further contracts between the Cleveland Railway and the union will not carry any "closed shop" agreement.

By a vote of two to one, the Court of Appeals also decided that the Cleveland Railway had a perfect right to withdraw, as it did, from the arbitration proceedings of last June. In these arbitration proceedings two of the arbiters granted the platform men of the Cleveland Railway an increase in pay of 12 cents an hour. The Court of Appeals upheld the lower courts in deciding that the sitting of James W. Holcomb as the third arbitrator in the case constituted "a legal fraud." The court ruled that Mr. Holcomb had disqualified himself as an arbiter in the case by his conduct and by the fact that the union had indorsed him for a federal position. In the lower courts the "closed shop" agreement between the company and union was held to be valid.

William S. Fitzgerald, one of the international vice-presidents of the Amalgamated, has gone to Cleveland to try to help the car men's local and determine what the union's next step shall be. A mass meeting of the men was scheduled for April 8, to determine what the union should do, by reason of the adverse court decisions, and also by reason of the fact that May 1 is the time for seeking a new wage agreement.

Central New York Railways After Bus Franchises

The establishment of an extensive network of bus lines in Central New York is forecast by the announcement that a new concern, the Mid-State Coach Lines, Inc., has filed articles of incorporation in Onondaga County. This concern will be owned by the Rochester & Syracuse Railroad, the Empire State Railroad, the Auburn & Syracuse Electric Railroad and the Syracuse Northern Electric Railway, Inc. These lines already are seeking bus line privileges in Oswego and Auburn, and on a route which would connect Syracuse and Oswego.

The purpose of the company is to operate buses as feeders to existing railway lines, the companies retaining separate identities for carrying on their railway operations.

In the meantime the Auburn & Syracuse Railroad officials are seeking bus privileges in Auburn in competition with an unnamed client of Frank J. Cregg, Syracuse corporation counsel, for the privilege of running buses in that city.

Talmadge C. Cherry, vice-president of the Auburn & Syracuse Electric Railroad, and vice-president and general manager of the Rochester & Syracuse Railroad, recently addressed the Common Council of Oswego on behalf of the bus line application. His buses would run on a 7-cent fare. James W. Dillon, Syracuse, who is operating buses successfully on a 5-cent fare in the neighboring city of Fulton, has offered to run the Oswego buses on a 5-cent fare.

The officials of the Mid-State Coach Lines, Inc., are: Directors, T. C. Cherry, Walter K. Zinsmeister and Harry C. Stanton, Syracuse, and Ray S. Messenger and William Harvie, Auburn. All are connected with the Auburn & Syracuse Electric Railroad.

Chicago and Milwaukee Grants Defeated

Elections Unfavorable to Proposed Settlements in Mid-West Cities—Third Vote in Chicago in Twelve Years—Milwaukee's Need Less Immediate than Chicago's

CHICAGO'S $500,000,000 transportation ordinance was beaten soundly in a referendum on April 7. It provided for co-ordination of surface and elevated lines and establishment of subways and bus lines under city management and eventual city ownership. The existing surface lines are now up against a franchise fight, the franchises expiring in 1927. The vote was a surprise. The final figures follow:

For adoption of ordinance	227,554
Against adoption	329,228
Majority opposed	101,674
For operation of lines	226,681
Against operation	327,543
Majority opposed	100,862

Analysis of the vote shows that while it could not be termed wholly intelligent, it was at least typical, and the record number of voters at a by-election can be taken to mean that Chicago is definitely against any municipal ventures in running transportation lines. It is the third defeat of a transportation referendum in twelve years. That the voters did not understand in some districts was shown by the fact that some persons voted against the establishment of the system but voted in favor of the city operating it.

Lined up against the measure and represented by the Hearst newspapers were scattered political organizations and the remnants of the old spoils gang which had a "5-cent fare" platform as its transportation policy. Hearst claimed a victory, but all the aldermanic candidates indorsed by him and by William Hale Thompson were beaten at the same time that the traction ordinance went down. They were all anti-ordinance. The separation of politics from the referendum was evident.

Mayor Dever said plans will go forward at once for a new ordinance drawn along different lines.

The campaign went into high gear four weeks before the election and like all other campaigns threatened to lose sight of the main issue. Mayor Dever, however, kept the proponents of the ordinance from hysteria. He proved to be an ideal campaigner, never making an unqualified statement he could not personally back up. This was one of the qualities that helped the pro side.

The personality and partisanship elements became important at the outset. William Randolph Hearst with two powerful newspapers, William Hale Thompson, a notorious demagogue who promised 5-cent fares while he was Mayor during the world post-war days and hired $100 a day "traction experts," and Governor Small, as well as many of their associates who were running mates of politicians tried lately on graft charges, were against the ordinance.

Roy D. Keehn, Hearst's personal representative, wrote to two internationally known bankers asking whether they would be under any obligation to purchase the Schwartz certificates, the medium of payment for the car lines. The bankers wrote that there was no obligation, but that the certificates would be readily salable if the lines were competently managed and they said they would recommend them to their investors.

This reply drew the headline "No Bank Cash for Car Lines," and the bankers indignantly demanded a retraction.

William Hale Thompson publicity sheets warned the public to "beat the biggest traction steal ever attempted." Said Mr. Thompson:

> This ordinance provides for an increase of car fares to not less than 15 cents. The new measure would relieve the traction monopoly from paying taxes and would saddle upon the taxpayers an outlay of $172,000,000.
>
> This ordinance would prohibit modern rapid transportation. It would bind the people of Chicago to the use of the present obsolete system. It would give control of Chicago's streets in perpetuity to the Morgan-Wall Street-Brennan financial pirates. . . . Lies. . . . sugar-coated promises . . . higher taxes . . . jammed through council . . . nefarious scheme to pick the pockets of the strap hangers . . . boodle.

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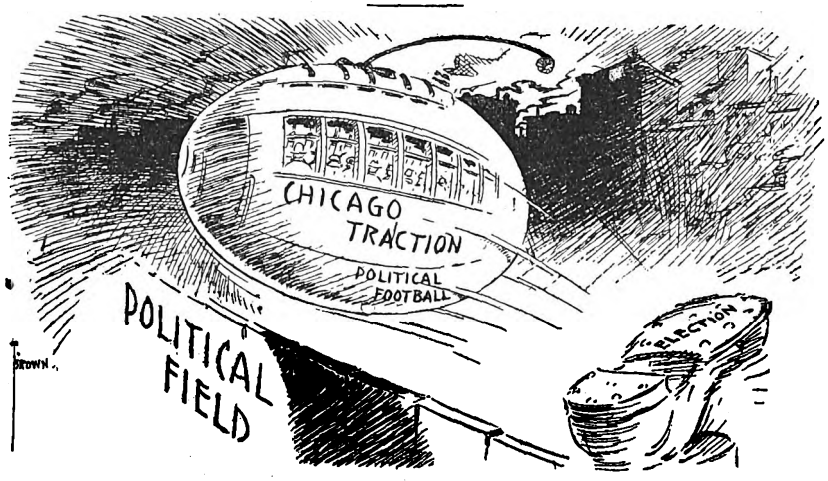
Henry A. Blair, president of the Chicago Surface Lines, after a first word of caution against the ordinance because of his mistrust of municipal operation, meticulously avoided mention of it as did his associate, Leonard A. Busby, head of the south side surface lines, a strong advocate of the co-ordination. Samuel Insull was out of the city for a month and returned on the last day with a statement that he indorsed the ordinance because its co-ordination and expansion program was necessary and could be had in no other way.

The Chicago Surface Lines is rounding out 18 years of service under an ordinance of which Mayor Dever, as an alderman, was part author. The lines ran for several years under separate managements, but were co-ordinated, and since that time have made steady progress until they have been able to show a good financial sheet despite the fact that 55 per cent of net earnings have been paid annually to the city.

The elevated lines have been slower to respond, although there has been good management with good public relations work and advertising. The elevated has charged a cash fare of 10 cents, a ticket fare of three for 25 cents and a weekly pass for $1. The Surface Lines fare is 7 cents.

BACK IN THE OLD FIELD AGAIN.



Chicago "Daily News" Sees Traction Matter Again Football of Politics

Milwaukee Agreement Defeated

By a majority of more than two to one the people of Milwaukee, Wis., on April 7 overwhelmingly expressed their opposition to the adoption of the proposed service-at-cost contract between the city and the Milwaukee Electric Railway & Light Company. Under the terms of the contract the city would have received the right to participate in the management of the affairs of the company in the metropolitan area and would have had the opportunity to obtain the credit on surplus earnings which were to be used to reduce the purchase price of the properties should it have been decided to purchase them at some future date. The vote in every ward was against the contract.

Such prominent proponents of the contract as Mayor D. W. Hoan and Fred S. Hunt, chairman of the Public Utilities Acquisition Committee, which spent five years in investigating and negotiating the contract, declare that the people unwisely passed up an excellent opportunity to bring about local regulation of their utilities in favor of a continuance of the present alleged unsatisfactory regulation by the Wisconsin Railroad Commission. These men feel that the people were misled and did not have a clear understanding of the contract. Two of the three local newspapers were in favor of the plan, while the other opposed it. All local civic organizations passed resolutions favoring the contract with the exception of the Engineers Society of Milwaukee.

Although the plan was defeated it is expected that out of it much good will come to the city in the way of facts and data which were brought out in the preparation of the contract. The city now has a better conception of the company's operating and financial affairs. Possession of these facts, it is maintained, will be of great value to the city in preparing its side of future service and rate cases.

In spite of the overwhelming defeat of the service-at-cost contract a new movement is on foot by city administration champions of the contract which is designed to accomplish their aims in a more sweeping manner. The new move is in the form of an out and out public ownership bill introduced in the Legislature by Assemblyman Thomas M. Duncan, Milwaukee Socialist leader and secretary to Mayor Hoan. Under this municipal ownership bill, power would be given to the city of Milwaukee or any other city in the state to take over its public utilities through the creation of so-called public service districts. Through the establishment of these districts in Milwaukee the present law limiting the city to an indebtedness not exceeding 5 per cent of its assessed property valuation would be evaded. This so-called district, by making its geographical lines vary slightly from Milwaukee's present city limits, could again bond itself up to 5 per cent of the assessed valuation of the area, thus paving the way for the public ownership, operation or control of the public utilities properties supplying service in such districts. Under the plan the municipal ownership question would be submitted to the voters.

Voters of Rockford, Ill., on April 7 defeated a proposition to grant a railway franchise to the Rockford Public Service Company, a newly formed corporation, indorsed by Mayor J. Herman Hallstrom. The traction situation is in a muddle as the result of the refusal of a franchise to the present company, the Rockford City Traction company. The latter company has been operating two years without a franchise. It is expected that the question of granting a franchise to the Rockford City Traction company will be submitted to a special election later in the year.

Springfield Union Rejects Proposal for Mayors to Arbitrate

Employees of the Springfield Street Railway, Springfield, Mass., recently asked for an increase of approximately $1 a day for regular men and rejected a proposal laid before them by President Clark V. Wood that questions in dispute be submitted to an arbitration board of five to include the Mayors of the city of Springfield and Worcester. The men said they had "no desire to place the transportation question in politics." President Wood said the company could not possibly continue to pay the wages now in effect and at the same time furnish the service to which the public was entitled.

The trolleymen want to establish an eight-hour workday to be completed inside of eleven hours. They want a maximum wage of $6.40 a day for a six-day week, assuring a maximum weekly wage of $38.40. The present wage of the trolleymen is $5.44 a day.

The cancellation of the contract, according to President Wood's proposal, makes it necessary to draft a new contract to become effective June 1. He suggests the appointment of an arbitration board, the company naming one arbitrator in five days from the date of the written agreement to arbitrate; the employees naming one within the same period. The Mayor of Springfield and the Mayor of Worcester will each be asked to act as an arbitrator, or to appoint some person as representative to act in his stead, and the two Mayors or their respective representatives will have the power to select the fifth member of the arbitration board to act as chairman. The decision of the majority of the board will bind both management and employees for a term of years beginning June 1, 1925, and not exceeding three years as the board may fix.

Railway Wants Bus Rights in New York City

Twenty-six applications for bus franchises were filed on April 9 with the franchise bureau of the Board of Estimate of New York City in accordance with the amended specifications suggested by the Board of Transportation. This is less than half the number of bids received under the first call for suggestions. The Interborough Rapid Transit Company, the Brooklyn-Manhattan Transit Corporation and the Third Avenue Railway, which had previously applied for franchises, failed to file new applications.

Of the existing transportation companies, other than those operating bus lines, only the New York Railways through a subsidiary filed a new appli-

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cation. This application offered to surrender the perpetual franchises for five surface lines and substitute bus operation, if franchises were granted for 25 years or for a lesser period sufficient to amortize out of bus earnings the investment in the electric railway property abandoned.

The Manhattan Surface Coach Company made two applications, signed by its president, H. J. Sheeran, receiver for the New York Railways. One application stated that the New York Railways was willing to surrender its perpetual franchises for the following surface lines and substitute bus operation:

Seventh Avenue-Delancy Street line, Sixth Avenue line, Columbus-Lenox Avenue line, Eighth Street crosstown line and the 116th Street crosstown line.

In its proposal known as application No. 1 the company estimated the investment required to provide equipment and facilities to render the service contemplated on the 12 routes outlined by the Board of Transportation to be in the neighborhood of $6,455,000, made up as follows:

Buses	$3,579,000
Garage and maintenance equipment	2,226,000
Organization and other intangibles	350,000
Supplies and working capital	300,000
Total	$6,455,000

Proposal No. 2 places the number of double and single deck buses at 432, involving an investment of $4,108,500 in buses. A front-drive type of vehicle is proposed to be used. On crosstown east and west lines a fare of 5 cents per passenger is proposed, but on the longitudinal or north and south lines the fare would be 10 cents cash, with tokens sold at the rate of twelve for $1.

Steam and Electric Roads After Bus Privilege

The Eastern Massachusetts Street Railway has taken up the gauntlet of the Boston & Maine Railroad in the fight over the bus line which the street railway is maintaining between Boston and Lowell, Mass. The issue was fought in a preliminary skirmish in Woburn, where the electric's bus rights were revoked. Later the issue may have to be decided in other communities.

The Boston & Maine says that it should be carrying 1,000 passengers a day for full fare between Lowell and Boston; that it depends upon its full-fare passengers to enable it to maintain frequent service and low commutation rates, so that if the Eastern Massachusetts is permitted to maintain its bus line to take away the full-fare passengers it will be necessary for the Boston & Maine to raise its fares and to curtail its service. It declares further that when the Eastern Massachusetts takes away one $1 passenger the Boston & Maine loses $4, because it loses the passenger, but has to maintain the service.

The Eastern Massachusetts replies to this argument that it has prior rights in the field, because it asked for these licenses last summer. Having obtained its licenses from the several cities and towns it invested about $80,000 in buses and established a scheduled service which is carrying an average of 250 passengers a day between Boston and Lowell, and the income covers the cost of the service. In addition to this the Eastern Massachusetts has close to $5,000,000 invested in the Lowell district, and is obliged to protect this property. If it had not gone into the bus service some private concern would have entered the field.

Buses for Kansas City

Franchise Approved Under Which Railway Expects to Start Service Soon with 63 Vehicles—Attitude of Public Is Favorable

AUXILIARY bus service by the Kansas City Railways is apparently assured. On April 6 the City Council of Kansas City, Mo., passed the ordinance allowing the company a franchise for three years. The ordinance has been in the hands of the special bus committee and the City Council since Dec. 1, 1924.

The receivers for the railway originally asked for a twenty-year franchise. The city's bus committee considered this period much too long. The life of the franchise was finally agreed upon as three years and an ordinance stipulating such duration of the exclusive franchise was drafted and presented to the City Council for its approval. Buses seemed practically assured, but when the Council voted upon the measure the Democratic faction of the lower house formed a bloc by proposing an amendment to the effect that the franchise should terminate within six months after the end of the present receivership and refused to pass the ordinance as it stood originally. The amended bill was referred back to the committee, which, in turn, re-referred the bill to the lower house in its original state. It was returned to the committee the second time, and once more was returned to the House for passage or rejection.

During the week ended April 4 members of the Democratic bloc were credited with saying that they would compromise upon a two-year period, but the receivers for the railway expressed very grave doubt that Judge Kimbrough Stone, referee, would approve a grant so short in duration. The result was that when the bill was to go before the Council the last time the public had almost given up hope of having a bus system. However, leaders of the Democratic bloc surrendered and voted with the Republicans for the approval of the franchise bill in its original state.

The receivers of the railway are said to be well pleased with the final action on the ordinance and seem confident that there is to be no further delay in starting the system of buses. Under the provisions of the ordinance the receivers are allowed 60 days in which to accept the franchise. If Judge Stone approves, and the company is able to obtain delivery on its bus orders, the first buses are expected to be in operation 45 days thereafter. Judge Stone is said to have expressed the intention of approving any franchise permit which would be fair to the city and to the railway. The receivers are said to have definitely agreed to present the franchise to Judge Stone at once.

There are to be nine routes in the operation of the proposed service, and after the date at which the first line must be in operation (3½ months after April 6) two additional lines must be put in operation each month until the entire system of nine lines has been consummated. The receivers are said to have expressed their belief that some of the lines will have been established by July.

Mayor Beach signed the ordinance on April 7.

The main points of the franchise follow:

The railway must operate nine permanent routes, specified in the franchise.

The fare on all lines, excepting route No. 5, which is to have express service, will be 10 cents. Express route fare will be 25 cents.

Transfers from buses to street cars and from street cars to buses are to be issued for 3 cents additional on all cross-town or feeder lines.

Buses are to operate from 7 a.m. to 11:30 p.m.

Headways are not to exceed fifteen minutes in rush hours and not more than twenty minutes in non-rush hours, Sundays and holidays.

Capacity of each bus is to be a seated load.

License fee is to be $75 for each single-deck bus and $100 for each double-deck bus.

Smoking is to be prohibited on all buses except the double deckers, on which smoking will be allowed on the rear of the upper deck.

The railway is to assume liability in case of accidents.

Double-deck buses are to be operated on four routes and single-deck buses on all other routes.

Sixty-three buses are considered by the receivers to be necessary to the proper operation of the various routes. The receivers say that although they have not finally decided upon the make of bus to be used, they have decided upon the general type and will make their final decision and order the buses just as soon as Judge Stone has definitely approved the arrangements. The investment requisite for the inauguration of the service is estimated at about $750,000.

A garage with 25,000 or 30,000 sq.ft. will be required to house and service the 63 buses. The railway shops are said to be adequate for all rebuilding and heavier repairs. The old quarters of the defunct company which promoted the Priests of Pallas festival in Kansas City for many years have recently been under consideration as a prospective garage, but nothing definite has been decided.

Senator Wilson is credited with a statement that there will be no curtailment of the present street car service after the buses are going.

On favorable approval of the project from Judge Stone, bondholders and other creditor interests will have the right to enter an appeal, but in all the length of the present receivership there have been no appeals against any previous decisions of the referee and none is expected in this matter.

The general attitude of the public toward the projected bus service, so far as it is known, seems to be more than favorable.

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Cleveland Bus Routes Approved

Nine bus routes to be operated by the Cleveland Railway, Cleveland, Ohio, starting about the middle of June, have been approved by the Cleveland City Council. Seven of the routes will be used as feeder lines to the street car system, while two more will be main lines of the Cleveland Railway. In approving the operation of buses by the Cleveland Railway over these routes, the Cleveland City Council ignored an application by the Metropolitan Motor Coach Company for permission to operate buses at a 5-cent fare. The Cleveland Railway is to charge 10 cents on its buses. The Metropolitan Company now has applied to the State Public Utilities Commission for a certificate of convenience and necessity for the operation of buses in Cleveland, but inasmuch as a law just passed by the State Legislature and signed by the Governor gives cities the control over buses operating within municipalities, it is unlikely that action will be taken.

New York State Employees File Demands—Company Counters

Demands for wage increases have been filed by employees of the city lines of the New York State Railways in Utica, Syracuse and Rochester, as well as by workers on five interurban lines, the Rochester & Syracuse, Empire State, Syracuse Northern and Auburn & Syracuse, who demand 70 cents an hour, and the Syracuse & Eastern, who ask a raise from 50 to 57 cents.

The railway asks its employees to accept a cut from 55 to 50 cents an hour for city line workers, with 5 cents an hour additional for one-man car operators. One of the proposed changes is a slash in overtime payment from 22 to 10 cents above the regular rate.

It has been understood that the traction company will ask for a clause in the contract which will permit separate negotiations with the unions in the three cities. At present agreements must be made by joint vote. A conference on the new pact is set for about April 15. In case settlement is not reached by May 1, the terms of any agreement that may be reached are retroactive to that date.

Among other measures the trolley men ask one day of rest in seven, an insurance fund providing $1,000 payment on death or total disability of workers and hospital cases, doctors' fees and full wages for those temporarily disabled for more than seven days. They also request that all men on buses operated by the company or its subsidiaries be union members. Time and a half for overtime, instead of the present 20 cents an hour extra, and a guarantee of six hours a day for all extra men in place of 42 hours per week are among the demands.

Tornado Damage Repaired Promptly

Tornado damage done to the property of the Southern Indiana Gas & Electric Company, as reported in the ELECTRIC RAILWAY JOURNAL of March 28, page 517, was substantially correct as to the estimate of its amount, but the report, based on an early survey, was misleading as to the estimate of the length of time the traction service might have to be suspended. This was put as a probable period of several weeks. Transportation service was maintained continuously from the morning of March 19, the day after the storm, by means of buses run through the damaged area. Normal electric train service was restored on March 22, the fourth day after the storm. As for the power and light service, it was restored the day after the storm.

Suggest Experts for Tacoma and Board of Five to Make Test

Statement of what the officials of the Tacoma Railway & Power Company, Tacoma, Wash., believe should be the basis of a plan for final settlement of the transportation problem of Tacoma and two suggestions for a test of operation under some plan that would involve joint city-company representation were contained in a document presented recently to the City Council by the company.

After reviewing the difficulties and declaring that the railway is vital to city transportation, the statement concludes that, to give the best transportation at the lowest cost, jitneys must be abolished, also gross earnings tax and free rides for city employees; that paving requirements must be modified, the company be allowed to extend service by car or bus, and fares be so adjusted as to give good service at a reasonable rate of fare.

The documents suggested that experts mutually agreed upon be employed by the city to investigate facts and recommend a plan for a try-out. Both company and city will be bound to test the plan. An alternative would be to create a board with control of both the traction lines and the municipal car line, the Tacoma Railway & Power Company to operate the system and receive at the end of a test year a return equivalent to the average net earnings for the last five years. Both company and Council would be bound to accept a final plan that the board would report back after its experiment.

No Agreement in Hudson

Efforts at a compromise having failed between the city of Hudson, N. Y., and the Eastern New York Utilities Corporation over car service in Hudson, additional evidence was heard by the Public Service Commission, on April 1, on the company's application for consent to abandon its local tracks.

A new statement of income and expenses was submitted by the company today purporting to show the deficits sustained by the company each year since 1917. The figures of deficits by years show: 1917, $9,095; 1918, $7,518; 1919, $6,610; 1920, $6,841; 1921, $9,895; 1922, $8,968 and 1924, $8,835. It was claimed that these figures were exclusive of any return on the capital invested in the line. The company also submitted statements showing the number of passengers carried by months for each year since 1916.

Summary of Recent Bus News

With the Public Service Commission about to grant to the Albany Transit Company, operating a fleet of buses, in Albany, N. Y., a raise in fare from 8 to 10 cents, and the United Traction Company, operating in Albany, Rensselaer, Watervliet, Troy, Cohoes and Waterford requesting a raise in fare from 7 to 10 cents, Mayor Hackett of Albany comes out with a statement that a New York City bus company has offered to come into Albany and give service at a 5-cent fare. On the other hand the Common Council of Albany has just given the United Traction Company permission to operate buses on its Western Avenue line, where there has been a controversy for several years regarding paving and double tracking. The Albany Transit Company is the successor to the W. I. A. T. Corporation, Inc., one of the pioneer bus lines up state. Mayor Hackett has twice carried Albany by overwhelming pluralities. As political wiseacres see it, if he is successful in his fight for a 5-cent fare, not only will he become prospective gubernatorial timber but his influence will be reflected in other upstate cities on the traction issues.

Just before adjournment the New York State Senate killed the Fearon bill, permitting electric railways to establish bus lines without incorporating as separate companies. The fight against it was led by Buffalo Senators who were supported by most of the Democrats. Senator Hickey of Buffalo called it a grab bill, declaring it would give the electric railways a monopoly on all local transit lines. Senator Fearon explained the cities were adequately protected, and the proposed bus lines could not operate without the consent of local authorities.

The St. Louis Bus Company, subsidiary of the United Railway, St. Louis, Mo., opened its third bus line on April 5. This route is known as the Morganford Road-Kingshighway Boulevard line. A report of the company's operations filed with the City Comptroller recently showed a total revenue of $4,466 for a period of a little less than three months from Nov. 9, 1924, to Jan. 31, 1925. The city was paid a 3 per cent gross receipt tax totaling $134 for this period. Since January the two existing bus lines of the company experienced a decided increase in business.

Public Service Commissioners recently heard the application of the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for a certificate of convenience to operate buses between Fox Chase and Richboro, Bucks County, a distance of 12 miles. A bus line is now operated between the points named by Charles Springer and an application is pending for the transfer of Springer's certificate to the Richboro-Fox Chase Bus Company. Nelson T. Brown, vice-president of the Philadelphia Rural Transit Company, said that his company was having 73 buses constructed, several of which could be placed in service at once.

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News Notes

Arbiters Disapprove Wage Petition.—A board of arbitration, of which John Hays Hammond is chairman, announced on April 3 its disapproval of a petition made by the trainmen of the Capital Traction Company, Washington, D. C., for an increase in pay. The board recommended a continuance until March, 1926, of this agreement. The men asked for a straight rate of 70 cents an hour as a substitute for the existing agreement, under which they are paid 52 cents an hour for the first three months of employment, 56 cents an hour for the next nine months and 58 cents an hour thereafter. The company made a counter-proposal that the scale be reduced to the one in effect in March, 1923. This ranged from 50 cents an hour for the first year to 56 cents an hour after three years' service. The board suggested that representatives of employer and employees meet to consider working hours and to interpret the wage scale.

Wants Seven-Cent Fares. — The Elmira Water, Light & Railroad Company, Elmira, N. Y., recently filed with the Public Service Commission an application for permission to put into effect by May 1 a 7-cent fare. The company is now charging a 6-cent fare. Some weeks ago it asked the commission to determine a reasonable fare. This application is now pending. Application for a 7-cent fare is made now in order that an increase in wages may be made to some of the employees, the petition says. It is proposed to increase the wages of trainmen about 5 cents an hour and grant increases to some other employees of the railway department. At present the trainmen receive 40 cents an hour as the maximum.

Fares Reduced by Detroit United.—The Detroit United Railway, Detroit, Mich., on April 6 announced a cut in fares of 25 cents between Mount Clemens and its Detroit terminal at Connors Creek to all purchasers of twelve trip tickets. A single fare was previously 45 cents, including 10 cents bus fare into the city.

Commutation Books Sold.—The Bamberger Electric Railroad, Salt Lake City, Utah, is issuing commutation books for the use of passengers, which will be transferable, making them good for individual use regardless of purchaser. This policy, effective April 1, is adopted at the request of some of the company's patrons and will be in effect for a trial period of 90 days, at the end of which time decision will be made as to its continuance.

Transfer Privileges Curtailed. — Announcement was made recently, by the Pittsburgh Railways, Pittsburgh, Pa., that the privileges of the extended area of the 10-cent special transfer would be withdrawn following the end of the trial period. While officials felt that the 10-cent transfer met a long felt need in the city of Pittsburgh, it is said the revenues of the company at this time are insufficient to permit the permanent adoption of this system, without further investigation as to its effect upon the daily receipts.

Fare Changes in Effect.—The Public Service Railway, Newark, N. J., has filed with the Board of Public Utility Commissioners of New Jersey a new tariff, which through a change in zones extends the 5-cent fare on the Broadway line in Camden, N. J. Under the new fare plan there will be a 10-cent fare between Westville and Camden instead of an 18-cent rate, a 15-cent fare between National Park and Camden instead of an 18-cent fare and a 15-cent fare between Blackwood and Woodbury instead of a 16-cent rate.

Wage Agreement Renewed. — The Morris County Traction Company, Dover, N. J., has renewed the wage agreement with its men. The contract expired on March 31. Under it trainmen received 50 cents an hour for the first three months, 53 cents the next nine months and 55 cents after the first year. The men sought an advance of 15 cents an hour. After the facts had all been laid before them the men agreed to an extension of the terms for a year without any change in pay.

Foreign News

Metropolitan Railway Revenue Increases

A dividend of 3 per cent for the second half of 1924 has been declared by the Metropolitan Railway, London, England, making 5 per cent dividend for the year. For 1923 only 4 per cent was paid. The general reserve has been credited with £25,000, against £15,000 in the previous year and £51,000 carried forward, as against £35,250 last year.

The developments of this company are reflected in the gradual increase of dividend payments, which seven years ago were only 1 per cent. The British Empire Exhibition at Wembley last year added much to the receipts. The Metropolitan Railway is independent of the Underground Railways group.

West Ham, England, Celebrates Birthday

A celebration costing about £600 was staged recently by the West Ham Tramways in honor of its 21st birthday. A brilliantly illuminated white car was paraded through the streets, displaying the information that 66,000,000 miles have been operated and 842,000,000 passengers carried since the inauguration of tramway service. As shown in the accompanying illustration, the car also bore the slogan, "Support Your Cars," and the dates 1904 and 1925, outlined in vari-colored electric lights.

Car Operated in Celebrating the "Coming of Age" of West Ham Tramways

Croydon Tramway Losses.—A loss of £54,000 was shown in the annual report of the Croydon Tramways, largely due to competition of motor buses and loss of traffic caused by track reconstruction. Early in 1925 cheap mid-day fares were introduced, but, according to the chairman of the tramway committee, this has been a failure. Arrangements are being made with the London County Council for through service, from London to Brighton in competition with express bus service.

Standard Rail Section for Sleeper Tracks. — The British Engineering Standards Association is being asked by the Municipal Tramways Association and the Tramways and Light Railways Association to prepare a standard spcification section of rail for use on sleeper tracks.

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Financial and Corporate

Slight Loss in Net at Albany

Review of Report of United Traction and Other Delaware & Hudson Electric Railway Properties

Operating revenues of the United Traction Company, Albany, N. Y., from all sources during 1924 were $3,205,856, operating expenses $2,739,408 and taxes $336,840. Operating income was $129,608, compared with $149,712 in 1923, a decrease of $20,104. Operating revenues decreased $28,293, or 1 per cent, as compared with the preceding year. Operating expenses decreased $67,312, or 2 per cent, and taxes increased $59,123, or 21 per cent. In operating revenues a loss of $36,425 resulted from decreased sales of power to other companies, but this was partially offset by an increase of 207,178 in the number of passengers carried, from whom revenue in the amount of $10,351 was earned.

Among the items of decreased operating expenses were: Injuries and damages, $38,300; paving, $54,013; transportation expenses, $13,733; power purchased, $15,054; removal of snow and ice, $36,685. But these were partly offset by the following increases: Maintenance of structures, $3,446; maintenance of power and line, $4,451; equipment retirements, $71,617, and track and roadway labor, $12,009.

The company's proportion of the cost of new pavement laid in 1924 was $212,759, of which $31,524 was chargeable to operating expenses and the balance to cost of property used in the public service. Reconstruction of tracks made necessary by a continuation of extensive street paving programs cost the company $330,165, requiring charges to operating expenses of $114,205. When the municipalities of Cohoes and Rensselaer decided to carry out during 1924 paving programs which would involve an expenditure of $117,000 on the part of the company for new tracks, structures and pavement, the management concluded that the volume of business did not justify such extensive participation and the tracks in this region were abandoned. Gasoline bus lines were substituted in Rensselaer and trackless trolley lines in Cohoes.

Operating revenues of the Hudson Valley Railway during 1924 were $910,215, operating expenses $935,025 and taxes $95,580. For the year there was a deficit of $120,390, compared with an income of $15,826 in 1923, a decrease of $136,216. Operating revenues decreased $50,893, or 5 per cent, from the preceding year; operating expenses increased $56,743, or 6 per cent, and taxes increased $28,580, or 43 per cent. Extensive use of automobiles is the principal factor in the decrease in operating revenues. In 1924 the municipality of Glens Falls engaged in a street paving program that cost the company $19,098, of which $2,901 had to be charged to operating expenses

Operating revenues of the Plattsburgh Traction Company were $30,562, operating expenses $31,920 and taxes $2,310. For the year there was a deficit of $3,668, compared with an operating income of $98 in 1923, a decrease of $3,766. Operating revenues decreased $2,682, or 8 per cent, from the preceding year; operating expenses increased $881, or 3 per cent, and taxes increased $203, or 10 per cent. It is explained that on account of continued and inevitable losses in the operation of this property it has been decided to close operations and to recover whatever portion of the capital represented may be practicable through its sale or salvage.

Operating revenues of the Troy & New England Railway were $25,235, operating expenses $21,345 and taxes $3,150. Operating income for the year was $740, compared with $7,082 in 1923, a decrease of $6,342. Operating revenues decreased $4,838, or 16 per cent, from the preceding year. Operating expenses increased $355, or 2 per cent. Taxes increased $1,149, or 57 per cent. It is explained that the management, convinced that profitable operation of the property is impracticable, has decided to discontinue the service and to "recover whatever is practicable out of capital by salvage." This is a 10-mile road between Troy and Averill Park.

The facts just reviewed are all contained in the annual report of the Delaware & Hudson Company for the year ended Dec. 31, 1924, advance copy of which was released for publication on April 1. No separate statements of earnings of the electric railways controlled by the company were contained in the report.

$940,000 Improvement by Public Service Railway

Earnings for 1924, Although Recording Deficit, Show Remarkable Change for Better—More Five-Cent Fares—About 15 per Cent of All Passengers Handled on Buses—Outlook Good

EARNINGS of the Public Service Corporation of New Jersey, Newark, N. J., for the year ended Dec. 31, 1924, were the largest in the history of the company. Gross earnings were $87,689,453 and the net increase in surplus was $5,583,072 before the payment of common stock dividends but after $2,430,046 had been paid on the preferred. The total amount of the common stock dividends was $2,959,329. Quarterly dividends at the rate of $1 a share were paid on the common stock for the first three quarters and at the rate of $1.25 a share for the last quarter.

In many respects the year 1924 was the most important in the history of the corporation. One of the big things achieved was the revamping of the corporation's financial structure under the advice of Drexel & Company, Philadelphia, and Bonbright & Company, Inc., New York, the corporation's bankers, so that several avenues of financing are provided with which to meet the corporation's constantly increasing requirements for new capital.

A decided improvement is reported in the status of the Public Service Railway. The company explains that as a result of a close study of operating conditions it was possible to effect economies which, while maintaining

INCOME ACCOUNT OF THE PUBLIC SERVICE RAILWAY FOR THE TWELVE MONTHS ENDED DEC. 31, 1924

	Public Service Railway	Public Service Railroad	Public Service Transportation and Subsidiary Companies	Other Affiliated Companies	Total
Operating revenues	$22,473,842	$304,602	$4,133,120	$1,345,612	$28,257,177
Operating expenses	11,358,905	98,078	2,759,656	607,375	14,824,017
Maintenance	3,405,155	66,703	1,439,842	57,752	4,969,452
Taxes	2,181,752	50,704	237,567	129,846	2,599,870
Amortization charges	801,888	.....	510,126	107,500	1,419,515
Operating revenue deductions	17,747,702	215,486	4,947,193	902,474	23,812,855
Operating income	4,726,139	89,116	814,072‡	443,138	4,444,321
Non-operating income (exclusive of dividends of affiliated companies)	140,153	793	2,832	17,252	161,031
Gross income	4,866,293	89,910	811,240‡	460,390	4,605,353
Income deductions (bond interest, rentals and miscellaneous interest charges)	5,126,586	119,616	28,352	65,635	5,340,191
Net income or loss	260,293‡	29,706‡	839,592‡	394,754	734,838‡
Profit and loss accounts (excluding dividends)	**2,401,782*	.....	41*	140	2,401,684*
Surplus (before dividends)	2,141,489	29,706‡	839,550‡	394,614	1,666,846
Intercompany dividends	284,624*	.....	.....	284,624	.....
	2,426,113	29,706‡	839,550‡	109,990	1,666,846
Dividend paid unaffiliated interests (Directors)	.....	.....	.....	176	176
Net increase or decrease in surplus	$2,426,113	$29,706‡	$839,550‡	$109,814	$1,666,670

‡—Deficit. *—Credit. **—Includes credit of $2,358,728.96 from sale of Public Service Terminal to Public Service Corporation of New Jersey.

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OPERATING REVENUE OF SUBSIDIARY COMPANIES OF PUBLIC SERVICE CORPORATION OF NEW JERSEY FOR TWELVE YEARS

Year	Electric Properties	Gas Properties	Transportation Properties	Total
*1913	$8,500,122	$9,960,937	$16,131,414	$34,592,473
1914	9,293,661	10,320,536	16,310,255	35,924,453
*1915	10,425,851	10,475,933	16,569,443	37,471,228
1916	12,814,597	11,558,413	18,175,764	42,548,775
1917	15,168,255	12,729,060	19,394,025	47,291,342
1918	17,587,806	14,578,269	20,831,762	52,997,838
1919	20,054,659	14,941,745	24,140,356	59,136,762
1920	23,563,929	20,872,062	27,882,095	72,318,087
1921	24,390,321	23,516,318	27,404,867	75,311,507
1922	27,660,026	23,152,426	27,544,509	78,356,962
1923	31,188,595	24,814,283	23,105,003	79,108,882
1924	34,889,632	24,542,643	28,257,177	87,689,453

* Change in classification of accounts effective Jan. 1.

former high standards of service and bettering the physical condition of equipment, caused a reduction in operating expenses sufficient to prevent a deficit in the income statement for the year. Not including a credit of $2,358,728 from the sale of the Public Service Terminal to the Public Service Corporation, the loss on railway and affiliated operations for the year was $734,838, compared with a loss of $1,675,534 for 1923.

Cars to the number of 951 were completely overhauled in the company's shops; 1,202 were repainted, and 1,216 motors were rebuilt; 19.7 miles of track was reconstructed with new rail; 7.8 miles with old rail; 2.3 miles of track extensions were made; 72 miles of new trolley wire installed, and the feeder system was extended to four new substations.

The use of one-man cars equipped with safety and labor saving devices has been largely extended. Whereas at the first of the year only 46 per cent of the cars in service were one-man operated, at the end of the year the number was 86 per cent of the total. The company says this change has not interfered with the quality of service, but has resulted in a higher average wage for operators and has substantially reduced expenses.

To make these results possible 1,023 cars went through the company's shops to be made over for one-man operation, the alterations including the installation of pneumatic door opening devices, the removal of bulkheads and bulkhead doors and the lengthening and reversing of car platforms.

Work done in the company's shops included not only the ordinary and extraordinary construction and repair work, but the building of 58 bodies for bus chassis owned by the Public Service Transportation Company, a record made possible because of the ample shop facilities available in both the northern and southern districts of the railway system.

Current recording meters were installed upon 1,133 cars, bringing the total of cars so equipped up to 1,700. Use of the meters resulted in a saving of current amounting to 4.85 per cent of the total power bill, although the number of passengers per car-mile largely increased.

It has been the policy of the company, where service could be improved and economy effected thereby, to substitute bus for car service, and this has been done in part or in whole on thirteen lines in various places on the system where traffic was light and capable of being efficiently handled by buses. This has in some instances permitted a saving through relief from track and maintenance charges. Track removed during the year totaled 7.6 miles, leaving the mileage of the Public Service Railway on Dec. 31 at 838,640, in addition to 49.632 miles owned by the Public Service Railroad, a total of 888.272 miles.

STATEMENT OF MILEAGE OF THE PUBLIC SERVICE RAILWAY DEC. 31, 1924

	Miles
First main track	530.834
Second main track and turnouts	298.161
Connections, crossovers, wyes and loops	12.375
Carhouse and yard tracks	46.902
Total	888.272

Total number of passenger cars available for operation:

Closed	Open
1897	399

Number of new passenger cars since 1903:

Closed	Open
1493	327

Track reconstructed with new rail during 1924	19.721
Track reconstructed with same rail during 1924	7.811
Extensions built during 1924	2.32

It was found possible during the year to discontinue the use of the Hoboken and Pavonia carhouses. The cars formerly operated from them were assigned to other houses in the vicinity without interference with service. At the same time the use of the Broadway Terminal, Paterson, as an operating terminal was done away with and Paterson cars are now all operated from the Market Street carhouse.

The 5-cent unit plan of fares recommended by the State Board of Public Utility Commissioners and adopted for certain of its lines by the company in 1923 was put into effect upon other lines during 1924, notably the entire Central Division and on additional lines in the Essex and Passaic Divisions. The company says the 5-cent rate is substantially equivalent to the rate in existence at the time of its adoption, but that the use of the nickel unit makes collection easier and more speedy.

Bus Operations Reviewed

Progress was made during the year in forwarding the plan for a co-ordinated system of cars and buses. Many vehicles have been purchased from former operators and the company's original purchase of 100 new, modern buses was supplemented by an order for a second 100 of the same general type, delivery of which is now being made. Many of the buses taken over were in poor condition, the facilities for the rehabilitation were not on hand and for a time it was difficult to keep a sufficient number of vehicles on the streets to maintain schedules.

To overcome this difficulty there was established in the Day-Elder factory building at Irvington, recently purchased, a completely equipped bus repair shop with a capacity of 50 buses, in which it is possible to maintain and rehabilitate equipment in accordance with the high standard set. In the meantime an organization has been assembled which will be able to handle repair and overhauling work much more effectively and economically than was before possible.

A number of large garages for the storage, dispatching and minor maintenance of buses has since been secured. On the Essex Division two bays of the Hilton carhouse have been converted for bus use by the construction of concrete floors over the pits and the installation of heating and lighting systems; a suitable building in Queen Street, Newark, has been leased and remodeled, and part of the Orange and Passaic Valley carhouse in Orange has been converted for garage purposes.

In the Passaic Division the Lakeview carhouse in Paterson has been fitted up and makes a commodious garage admirably suited to its purpose. In the Southern Division a new bay was added to the Newton Avenue carhouse

TRANSPORTATION STATISTICS OF PUBLIC SERVICE RAILWAY FOR TWELVE YEARS

Year	Trolley Passengers	Bus Passengers	Total Passengers	Trolley Mileage	Bus Mileage	Total Mileage	Trolley-Hours	Bus-Hours	Total Hours	Passenger Receipts per Trolley-Mile, Cents	Passenger Receipts per Bus-Mile, Cents
1913	404,411,105	.....	404,411,105	49,853,408	.....	49,853,408	5,696,066	.....	5,696,066	30.97	.....
1914	407,277,914	.....	407,277,914	50,792,889	.....	50,792,889	5,665,119	.....	5,665,119	30.72	.....
1915	414,422,040	.....	414,422,040	51,873,660	.....	51,873,660	5,573,670	.....	5,573,670	30.49	.....
1916	451,698,012	.....	451,698,012	54,964,708	.....	54,964,708	5,911,131	.....	5,911,131	31.37	.....
1917	476,974,983	.....	476,974,983	56,087,403	.....	56,087,403	6,021,225	.....	6,021,225	32.44	.....
1918	451,220,806	.....	451,220,806	54,039,150	.....	54,039,150	5,698,089	.....	5,698,089	36.00	.....
*1919	396,689,234	.....	396,689,234	57,644,927	.....	57,644,927	6,039,453	.....	6,039,453	39.29	.....
1920	453,534,694	.....	453,534,694	60,798,743	.....	60,798,743	6,539,207	.....	6,539,207	43.21	.....
1921	435,679,801	.....	435,679,801	58,309,883	.....	58,309,883	6,212,276	.....	6,212,276	44.11	.....
1922	410,212,814	.....	410,212,814	56,419,982	.....	56,419,982	5,983,122	.....	5,983,122	45.59	.....
1923	354,194,933	1,952,059	356,146,992	49,272,078	505,322	49,777,400	5,206,092	60,663	5,266,755	42.75	22.26
1924	427,828,444	79,383,643	507,212,087	53,945,515	15,669,848	69,615,363	5,662,340	1,928,498	7,590,838	41.04	26.06

* Mile zone system in effect from Sept. 14 to Dec. 7.

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and alterations were made to the original north bay, providing ample accommodations. In addition, a number of smaller garages have been secured and are being operated.

The company feels that with sufficient equipment, with the repair shop and garage facilities acquired, with the new buses in service and with the experience gained through operation, prospects are bright for a decided advance in bus operating results during the coming year.

RATES

During the year the litigation involving the rate of fare lawful to be charged by Public Service Railway was ended. On May 28 Judge Rellstab of the United States District Court signed a final decree declaring that the valuations placed upon the company's properties by the State Board of Public Utility Commissioners were far below true values for rate-making purposes and that the challenged rates based thereon were confiscatory and illegal.

On Nov. 12 the United States Supreme Court, pursuant to a stipulation signed by both plaintiff and defendant, dismissed the appeal taken by the board from the decision of the special tribunal which, in October, 1921, granted a preliminary injunction restraining the board from carrying out its order fixing rates of fares.

The 5-cent unit schedule of fares which was put in effect on Oct. 1, 1923, at the suggestion of the utility board, for a period of four months has been continued and extended by the company and it is the intention to still further apply it as conditions warrant.

During the year the Public Service Railway retired $408,000 of equipment trust certificates of series "D," "E" and "F" in accordance with the equipment trust agreements. The $1,291,000 North Hudson County Railway 5 per cent improvement mortgage bonds maturing May 1, 1924, were extended for two years at 6 per cent.

$899,617 Balance for Year for Illinois Power & Light

Clement Studebaker, Jr., president of the Illinois Power & Light Corporation, Chicago, Ill., explains in presenting the annual report for the year ended Dec. 31, 1924, that the financial position of the company has been steadily growing stronger since its organization, a large increase in working capital represented by net current assets having been attained during the year. Capital expenditures were made during the year in the amount of $11,284,363. Other than funds derived from earnings and the sale of preferred stock, those required for capital investment and refunding of maturing underlying bond issues were secured from the sale of first and refunding mortgage bonds on favorable terms. A reduction in the interest charge on bond financing occurred during the year when a block of $5,000,000 of bonds was sold in December bearing 5½ per cent, whereas the bonds sold early in the year were at the rate of 6 per cent. The market quotations of all of the company's securities have also steadily advanced as their strength from an investment standpoint has become better known.

While the first year, 1923, was one of consolidation and financing, the year 1924 was primarily one of organization and development of general policies looking to the strengthening and harmonizing of the various companies as an operating entity. The gross income was $29,184,288. Net earnings before the deduction of interest, dividends and allowances for depreciation were $9,607,966 and after all these allowances the balance carried forward was $899,617.

During 1924 the company acquired by purchase and incorporated into the system utility properties which are rendering to their communities different kinds of service such as electricity, gas, ice and in a few instances bus transportation.

Mr. Studebaker says the coming year gives promise of being one of continued advance in the various branches of the business. The large capital investments that were needed by the properties at the time they were consolidated into the present companies, some of which have been made or are under way, promise to produce adequate earnings on the capital invested and the directors feel that their best efforts should be put forth to insure the growth of the plants and facilities in proportion to the increasing demands of the communities served.

DISTRIBUTION OF NET EARNINGS OF ILLINOIS POWER & LIGHT CORPORATION IN 1924

Total net earnings		$9,607,966
Less fixed charges:		
Interest charges, etc.	$4,975,922	
Bond discount amortized	207,024	5,182,946
Surplus available for dividends and depreciation		$4,425,019
Dividend on preferred stocks, Illinois Power & Light Corporation and subsidiary companies		1,633,721
		$2,791,297
Appropriated for depreciation, retirements, replacements, etc.		1,891,680
Balance		$899,617
Surplus, Jan. 1, 1924	$1,034,957	
Add adjustments	17,563	1,052,521
		$1,952,139
Dividends paid on common stock, 1924		700,000
Surplus per balance sheet		$1,252,139

COMPARATIVE STATEMENT OF EARNINGS OF THE ILLINOIS POWER & LIGHT CORPORATION

	1920	1921	1922	1923	1924
Gross earnings:					
Electric light and power	$7,891,608	$9,209,945	$10,442,751	$12,400,996	$13,871,432
Gas	1,302,671	1,623,824	2,195,048	2,722,533	2,973,364
Interurban lines	7,175,660	7,161,772	6,939,641	6,676,610	6,032,489
City lines	4,714,116	4,596,796	4,506,913	5,178,391	4,849,246
Heat	557,246	527,454	574,258	620,363	685,777
Water	71,926	77,872	90,415	100,190	101,125
Miscellaneous	381,140	302,215	315,583	231,769	170,266
Other income	.....	.....	.....	.....	500,585
Total gross earnings	$22,094,370	$23,499,883	$25,064,611	$27,930,854	$29,184,288
Operating expenses, maintenance and taxes	16,352,776	17,066,428	17,746,168	18,811,807	19,576,322
Total net earnings	$5,741,594	$6,433,454	$7,318,442	$9,119,047	$9,607,966

Plattsburgh Property Sold

At a meeting of the Mayor's committee at Plattsburgh, N. Y., with H. B. Weatherwax, vice-president of the Plattsburgh Traction Company, John F. O'Brien, chairman of the board of the Plattsburgh National Bank & Trust Company and part owner of the Dock & Coal Company, offered to purchase the property of the Plattsburgh Traction Company for $10,000, subject to the existing liens. Operation will be continued by the present owners, the Delaware & Hudson Company, until May 1. At that time Mr. O'Brien will assume control. Mr. O'Brien said that he was taking over the Plattsburgh Traction Company as a civic duty, and that he had no intention of scrapping the lines as long as they pay operating expenses.

The situation confronting the Plattsburgh Traction Company is referred to in the review of the earnings of the Delaware & Hudson Company's electric railway properties elsewhere in this issue of the ELECTRIC RAILWAY JOURNAL.

Verdict Favors Dissenting Manhattan Stockholders

The Appellate Division of the Supreme Court of New York decided on April 3 against the Interborough Rapid Transit Company, New York, in two cases on the subject of whether or not that corporation must pay 7 per cent dividends to the few holders of Manhattan Elevated Railway stock who had never assented to the "readjustment plan of May 1, 1922," whereby owners of about 95 per cent of that stock agreed voluntarily to accept dividends, beginning at 3 per cent, in 1922 and gradually working higher until now it is 5 per cent.

Phoenix System May Be Abandoned

The Phoenix Railway, Phoenix, Ariz., contemplates giving up its franchise and junking its system. No reason has been given for the move except that the railway company has been losing money in the operation of its lines. The city some time ago charged the company with failure to live up to its franchise obligations. The case of the city to revoke the franchise is in the Superior Court.

In the meantime the Phoenix Motor Coach, Inc., and the City Transit Company are seeking permits to operate buses on the city streets. The application of the City Transit Company has been on file for some time. It calls for the operation of four trunk line bus routes covering practically the same routes traversed by the railway with feeders to other sections of the city. The City Transit plans to run 14 standard type 29-passenger buses with three coaches in reserve. It is the

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intention of the City Transit Company, should it be given the permit, to request the City Commission to place on the ballot to be voted on by the people in May, 1926, an ordinance for an exclusive franchise to operate buses in the city for a period of years, subject to certain terms and conditions to be worked out at a later date.

Phoenix is a city of 30,000. The railway has been operating 32 miles of line.

Earnings Decline

Columbus Railway Reports $200,000 Decrease in Net—Decline in Traffic —$5,000,000 on Rehabilitation

The net balance in the treasury of the Columbus Railway, Power & Light Company, Columbus, Ohio, at the end of the year 1924 was $566,602. In 1923 the net balance was $768,966, or a decrease for 1924 of $202,364. The gross income also fell off $43,413. These facts were revealed in the annual report of Norman McD. Crawford, the treasurer, to the stockholders. The operating expenses in 1924 were slightly higher than in 1923. Evidences of the company's carrying out a thorough rehabilitation program during the year 1924 are noted in the fact that total expenses charged to capital account amounted to $5,545,638. The principal items included affecting railway operation were $510,536 for track and roadway expenses, $2,842,834 for power stations and substations and $434,743 for a general office building. With the depreciation reckoned at $653,902 the total chargeable to property account was $4,891,736.

An accompanying table shows the traffic statistics for the years 1924 and 1923. The year 1924 has been the poorest month in the matter of total passengers carried compared with the preceding years. In 1920, 91,760,315 passengers were carried; in 1921, 85,446,483, in 1922, 85,588,813, in 1923, 87,519,868, and in 1924, 83,271,398. These figures refer to total passengers. Yet the number of transfer passengers was higher in 1924 than it was in 1920 and in 1921 but below the record in 1922 and 1923.

The revenue per revenue passenger in cents in 1924 was 5.09 higher than any of the four preceding years. Car mileage also was higher in 1924. In 1920 the car mileage was 8,747,000; in 1921, 8,516,300; in 1922, 9,021,024; in 1923, 9,377,377, and in 1924, 9,515,369.

INCOME ACCOUNT OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1924	1923
Railway operating revenues	$3,494,760	$3,702,221
Power, light and heat operating revenues	4,867,815	4,749,233
Non-operating revenues	26,615	11,268
Total gross revenues	$8,389,191	$8,462,724
Operating expenses	$4,956,324	$4,955,526
Taxes	808,545	839,461
Gross income	$2,624,322	$2,667,735
Deductions from gross income:		
Interest on funded debt	$868,929	$806,733
Interest on unfunded debt	53,266	13,354
Other deductions	64,942	62,042
Total deductions	$987,139	$882,130
Net income available for sinking fund dividends and other financial requirements	$1,637,182	$1,785,604
Deductions from net income:		
Sinking fund	$287,439	$233,650
Dividends—		
Series A preferred stock	121,636	121,636
Series B preferred stock	301,123	300,998
Common stock	360,381	360,354
Balance (credit to profit and loss account)	$566,602	$768,966

PROFIT AND LOSS ACCOUNT OF THE COLUMBUS RAILWAY, POWER LIGHT COMPANY

	1924	1923
Balance at beginning of year	$1,847,327	$1,467,196
Credits		
Balance from each year's operations	566,602	768,966
Delayed income credits	3,762	16,589
Miscellaneous credits	786,690	2,009
Total credits	$3,204,383	$2,254,762
Debits:		
Dividends (paid in stock):		
Series A preferred stock	$	$
Series B preferred stock		
Delayed income debits	27,584	28,480
Miscellaneous debits	123,072	378,954
Total debits	$150,656	$407,434
Balance at end of year	$3,053,726	$1,847,327

TRAFFIC STATISTICS OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY

	1924	1923
Revenue passengers	66,548,546	70,177,236
Transfer passengers	16,722,852	17,342,632
Total passengers	83,271,398	87,519,868
Per cent of transfers to total passengers	20.08	19.82
Revenue per revenue passenger in cents	5.09	5.08
Revenue per passenger including transfers, in cents	4.08	4.08
Car mileage	9,515,369	9,377,377

Negotiations Rather than Arbitration at Winnipeg

It is understood that the city of Winnipeg, Man., through its special rail committee, will enter direct negotiation rather than arbitration for taking over the street railway in 1927. According to the *Canadian Financial Post* the members of the committee will first ascertain what properties the company would turn over with its traction system and the price it would be prepared to take before discussing in detail the question of purchasing. In the meantime all data pertaining to the valuation of the system and separation of properties will be compiled and submitted to the Aldermen for close study.

These data will include copies of by-law 543, which contains the whole contract for operation of the rail system in Winnipeg, judgment of the Privy Council on the portion of the Pinawa power plant rightly chargeable to the transportation system, valuation of the physical properties made by the Public Utilities Commission and a copy of the draft agreement drawn up two years ago.

Deficit of $210,849.—For the year ended Dec. 31, 1924, the Sacramento Northern Railroad, Sacramento, Cal., reports railway operating revenues of $1.403,281 with operating expenses $1,302,441. The net revenue was $100,840 and the operating income $14,852. The gross income was $46,389. After the deductions from gross income the income deficit transferred to profit and loss was $210,849.

Tax Lien of $720,683 Against D. U. R.—A tax lien for $720,683, has been placed on the properties of the Detroit United Railway, Detroit, Mich., by one of the United States collectors of internal revenue. It represents additional income taxes which the United States government claims is due for the years 1917, 1918 and 1923. The Security Trust Company, one of the receivers, says that the claim is being contested by its attorneys, and that tax officials are in Washington in conference with the revenue officials on this matter.

Deficit in February.—After showing a profit for two successive months, the first recorded since the service-at-cost-franchise became effective, the earnings of the Youngstown Municipal Railway, Youngstown, Ohio, for February showed a deficit of $7,477. The number of passengers carried in February was 2,783,069, compared with 3,089,708 in January and approximately 2,900,000 for December. The deficit in the stabilizing fund on March 1 was reported to be $1,242,422.

Earnings of Spokane Lines Off.—No separate statement of earnings of its railway lines is contained in the report of the Washington Water Power Company, Spokane, Wash., for the year ended Dec. 31, 1924. Gross revenues were $5,299,926 and the surplus for the year $1,666,741. After the payment of dividends the surplus was $41,181. D. L. Huntington, president, in referring to the Spokane United Railways, in which the Washington Water Power Company has a substantial interest, said that it had an unsatisfactory year of operation. He said that the decrease in revenue mentioned in the report of the previous year due to the increased use of automobiles continued through 1924, with the result that the revenues of that property decreased $103,265, offset only in part by operating economies.

Consultants for Detroit United.—A. L. Drum & Company, Chicago, Ill., have been retained as consultants by the receivers for the Detroit United Railway, Detroit, Mich., to advise on the reorganization of the property and on steps for building the business up to a profitable basis.

Cumulative Vote Used to Elect Dayton City Directors.—Thomas A. Ferneding, former secretary of the City Railway, Dayton, Ohio, by combining his strength with that of Henry Mead, had both himself and Mr. Mead elected as directors of the company at the recent annual meeting by using the cumulative vote. At the meeting Harrie P. Clegg, J. Sprigg McMahon and G. H. Gorman failed of election. Valentine Winters, president of the company, continues as a director and as president of the company.

Measure Aims at Revaluation.—A measure looking toward a revaluation of the Philadelphia Rapid Transit Company, Philadelphia, Pa., was introduced in the Senate on April 4 by Senator Horace Schantz of Lehigh. It appropriated $100,000 to finance such investigations. Such a fund would provide the Public Service Commission with the

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means of complying with the recommendations of Dr. Milo R. Maltbie for a definite valuation. Under the measure the commission is given authority to expend the appropriation in any manner necessary to investigate and appraise utilities when such information is required on which to fix rates.

Preferred Dividends on Regular Basis.—The directors of the Louisville Railway, Louisville, Ky., recently voted a dividend of 2½ per cent on the preferred stock. The dividend is payable on April 10 to stockholders of record on March 26. The last of the deferred dividends on the preferred stock was cleaned up last December. The action of the company in getting preferred dividends back on a regular basis has resulted in a material advance in the quotation on the common stock.

Merger Plan Perfected. — Confirmation of the purchase of five Pennsylvania and New Jersey public utility companies by A. E. Fitkin & Company, New York, has been announced. The companies involved are the Scranton Railway, Altoona & Logan Valley Electric Railway, Carbondale Gas of Pennsylvania, Monmouth Lighting and the Shore Lighting of New Jersey. The proposal to take these properties over was reviewed at length in the ELECTRIC RAILWAY JOURNAL for March 14, page 428.

Par Offered for Municipal Service Holdings.—The Keystone Public Service Corporation, into which the Fitkin interests of New York have merged their recently acquired Pennsylvania properties, probably will take over the traction, power and light systems of the Municipal Service Corporation in that state. The Georgia and Virginia systems probably will be taken over by a new corporation to be organized in the near future. It is understood that holders of the common stock of the Municipal Service Company will receive more than $100 a share for their stock. The agreement of the purchase provides for the delivery of 75 per cent of the 60,000 shares outstanding to A. E. Fitkin & Company, who agreed to take 100 per cent. Reference to this proposed purchase was made in the ELECTRIC RAILWAY JOURNAL for April 4, page 563. The railway properties involved in the deal are the Citizens' Traction Company, Oil City and Franklin, Pa.; the York Railways, York, Pa., and the Youngstown & Suburban Railway, Youngstown, Ohio.

$20,000,000 Paid for Scranton and Other Properties.—Van Horn Ely, president of the American Electric Power Company, Philadelphia, Pa., is quoted as authority for the statement that the price of the properties recently sold to A. E. Fitkin & Company, New York, was about $20,000 000. The company is calling for payment four bond issues totaling $4,850,000 on July 1 and Sept. 1. Among the properties to change hands were the Scranton Railway, Dunmore-Moosic Lake Railroad, Scranton Bus Company, Altoona & Logan Valley Electric Railway, Lake-Mont Park Company and Logan Valley Bus Company. The negotiations which resulted in this sale were reviewed in the ELECTRIC RAILWAY JOURNAL for March 14, page 428.

Book Reviews

Growth of American Trade Unions 1880-1923

By Leo Wolman. Published by National Bureau of Economic Research, Inc., 474 W. 24th Street, New York, N. Y., 1924. 170 pages. $3.

Beginning with the birth of the Federation of Organized Trade and Labor Unions, the direct forerunner of the present American Federation of Labor, at Pittsburgh in November, 1881, this book traces the history of organized labor in the United States down to the present time. In determining the facts here presented, the National Bureau of Economic Research has followed its policy of providing men of all shades of opinion with objective knowledge of actual conditions. It has confined itself to stating facts as it found them. With opinions about the promise or the danger to American life from the growth of trade unions the book does not concern itself.

In a foreword by W. C. Mitchell, professor of economics Columbia University, the reason why this task was undertaken is explained. The first work essayed by the National Bureau of Economic Research was to determine as accurately as possible the size and distribution of the income produced and consumed by the people of the United States. Among the problems encountered in this research was that of the fluctuations in the national income from year to year. What produced these fluctuations? How were they shared by the various classes of income receivers? After the report dealing with the size and distribution of income had been published a new series of investigations was begun, dealing with income fluctuations. This study of the growth of American trade unions from 1880 to 1923 is an outgrowth of these investigations.

Changes in membership of American trade unions in the past 44 years are described. Analyses are given of the relation between the business cycle and changes in union membership. Tables indicate for each union and for each year its state of affiliation with or independence of the American Federation of Labor. In order to indicate the general nature of the growth or decline of the labor movement before 1897, incomplete series of membership statistics are presented from 1880 to 1897.

Twice during the last half century the membership of the American trade unions has reached remarkable peaks, from which it has later descended. The first peak was achieved in 1887, when its membership rose to about 1,000,000; the second in 1920, when it exceeded 5,000,000. In each case the labor movement failed to hold its maximum number. Reasons for these fluctuations are explained at length in the book.

To enable the reader better to understand the character of the American labor movement detailed descriptions are given of the changes in membership of fourteen groups of unions and of the most important unions within each group. Several interesting facts are brought to light in the author's analysis of the transportation group. For example, both the electric railway employees' union and the teamsters' organization participated in the general increase of membership in the transportation group during the years 1919 and 1920. Electric railway employees gained 40,000 members and the teamsters 55,000. But in the subsequent period of general decline the teamsters lost 40,000 members, while the electric railway employees more than held their own.

Tables and charts are presented showing the growth of other unions and groups of unions. Total membership figures for the years 1914 to 1923 are given for the trade unions of Australia, Canada, France, Germany, Italy, Holland and the United Kingdom. Comparisons are made also between the membership of trade unions and the numbers of people who are gainfully employed in industry. A chapter is devoted to a study of women in the American labor movement. While these latter subjects are perhaps not of direct concern to those interested primarily in the electric railway industry, they are details necessary to give a fair picture of the general situation.

All in all, this book is an interesting and valuable contribution to the study of the labor question in America. Its value is enhanced by the fact that it deals only with facts and avoids the expression of opinion. Its publication by the National Bureau of Economic Research provides a handy reference work for any business executive employing large numbers of workers.

Skinner's Mathematical Theory of Investment

By E. B. Skinner. Revised edition. Published by Ginn & Company, Boston, Mass. 269 pages. $3.40.

This is a revised edition of a well-known treatise brought out ten years ago. Two important changes distinguish the new edition: the more extensive use of the method of interpolation with one new chapter on the subject, and much new material on depreciation. Perhaps the greatest appeal of the book to engineers, public utility experts and steam and electric railway operators is made by this new chapter. In many respects the book is unusual as a contribution to investment literature. Its value appears to lie not so much in what is contained that is new as in the presentation in organized form of the mathematical chapters needed by insurance companies, investment bankers, and public service commissions. The object of the book is to familiarize the student of business or of public affairs with the mathematical material used in the modern office. The theory of interest, both simple and compound, the amortization of debts by various plans, the theory of bond values, depreciation, sinking funds, inheritance taxes, old-age pensions, and life insurance are among the subjects treated. The book is concluded with valuable tables.

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Railway Electrification

By H. F. Trewman. New York: Sir Isaac Pitman & Sons, Ltd. 244 pages, illustrated.

In a very clear manner the economics of railroad electrification are discussed. Systems in vogue are analyzed and costs are stated. The conclusion is that, in England particularly, electrification is profitable for all large terminals, for all roads within a 25-mile radius of large cities and for heavy-density trunk lines where freight haulage predominates. The direct-current system is favored for terminal and suburban electrification, and the author advocates a standard gage and standard electrification system. He computes a national saving in fuel of 60 per cent, but shows that capital investments required for complete electrification are so large that only piecemeal methods should be used in the electrification of English roads. The book is a valuable addition to the economics of railroad electrification.

Bus Operating Practice

By Hauer and Scragg. Published by the International Motor Company. American News Company, New York, distributor. 260 pages.

Numerous charts and other illustrations are used by the International Motors Company to add to the forcefulness of the record of the more important problems that confront bus-operating companies as set down in the book "Bus Operating Practice," by Hauer and Scragg. Although the record was brought together by a bus manufacturer the book really has all the value and dignity of a reference treatise. In a simple and direct fashion the growth of the bus industry is traced, and then all the important things that would come up in operation are considered in order, among them routes, operating permits, passenger terminals and selling the service.

The chapter headings, after all, probably give the best idea of the subjects it has been attempted to cover, which for that matter really have been covered in a readable and authoritative way so far as the development of the business has provided a background from which to draw lessons and form conclusions. These headings are: The Growth of the Bus Industry, Selecting Profitable Bus Field, Securing the Right to Run, Passenger Terminals and Waiting Rooms, Selling the Service, Operation, Indirect and Supplementary Service, Costs, Selection of Equipment.

City Will Help Oklahoma Railway

City Commissioners of Oklahoma City, Okla., are quoted as having given assurance that they will co-operate fully in trying out the remedies for the ills of the Oklahoma Railway recommended by the experts who have made a report in the matter. Co-operation of the city will involve amendment of parking rules and enforcing of traffic law provisions. George A. Henshaw, one of the receivers, says that steps will be taken immediately to carry into effect changes recommended by the report of the engineers. Whether the reformation of operating plans will include abandonment of the terminal station, which was recommended in the original report, is not certain.

Personal Items

J. F. Egolf Heads Illinois Association

New President of the State Body Is the Operating Head of Aurora Elgin & Fox River Electric Company

J. F. Egolf, the new president of the Illinois Electric Railway Association, is general manager of the Aurora, Elgin & Fox River Electric Company. In that capacity he has had outstanding success in the establishment of favorable relations between the railway management and its employees, and through them with the company's power and railway customers. Under his management the properties with which he is connected have been rehabilitated and have passed from a period of financial stress and receivership to an era of improved service and brightened outlook.

J. F. Egolf

In his steady rise from a conductor on the Columbus Street Railway, Columbus, Ohio, in 1898, to general manager of the Fox River properties Mr. Egolf fitted himself for increased responsibility by close observation and study of transportation work outside of his immediate duties. Through personal experience in transportation, track, shop and accounting departments of the various properties with which he has been connected, he laid the foundation for detailed familiarity with the problems of each department. This, coupled with a close contact with his men and the ability to understand their viewpoint, while at the same time maintaining discipline and efficiency, has characterized his career. Mr. Egolf is an ardent advocate of the idea that the platform men are his transportation salesmen and attributes the success of his work on the Fox River properties to the development of that principle in the minds of his men.

After serving as conductor and motorman in Columbus from 1898 to 1902, Mr. Egolf entered the mechanical department of that property as a car repair man. In the spring of 1903 he went with the Columbus, Buckeye Lake & Newark Railway as a motorman, and again served for two years on the platform, after which he was transferred to the dispatcher's office. This company was later absorbed by the Ohio Electric Railway, whereupon Mr. Egolf was sent to Springfield, Ohio, as chief dispatcher. In 1907 he was appointed assistant superintendent.

Additional experience as dispatcher and chief dispatcher was obtained with the Chicago, Lake Shore & South Bend Railroad. In 1914 he was made manager of the Springfield & Xenia Railway by the Warren Bicknell Company, Cleveland, Ohio. In July, 1918, this company transferred him to the Interurban Railway & Terminal Company, where he had charge of all operations until 1922. In that year he became general manager for the receiver of the Fox River Division of the Aurora, Elgin & Chicago Railroad. This property was subsequently purchased by the Western United Corporation, and on Feb. 1, 1925, Stone & Webster were engaged to operate it along with all the other subsidaries of the Western United Corporation. Throughout these changes, Mr. Egolf has been retained as general manager, having charge, in that capacity, of all the railway property of the Aurora, Elgin & Fox River Electric Company and of the lighting property in Elgin.

H. S. Newton Heads Monongahela Industrial Department

Henry S. Newton, formerly manager of the Parkersburg-Marietta division of the Monongahela West Penn Public Service Company, with headquarters in Parkersburg, W. Va., has been placed in charge of a newly created industrial department. C. H. Hardesty, traffic manager of the company, has been designated as acting manager of the Parkersburg - Marietta division. Through the creation of this new industrial department the Monongahela West Penn system, with main offices at Fairmont, intends to take an active part in aiding the industrial development of northern West Virginia. It proposes, through its manager, to have contact with all industrial organizations, chambers of commerce, boards of trade and like organizations in securing and locating suitable industries along its lines.

Mr. Newton has been in the employ of the Monongahela West Penn Public Service Company since early in 1918 and has been in charge of the Parkersburg-Marietta division since 1919. He has been identified with the Ohio Valley Electric Railway, Huntington, W. Va.; the Mesaba Railway, Virginia, Minn.; the Hartford & Springfield Street Railway, Warehouse Point, Conn., and also with the Syracuse Street Railway, Syracuse, N. Y. In addition to these affiliations he was at one time general manager and chief engineer of the Syracuse, Lakeside & Baldwinsville Railroad and general manager of the Beaver Valley Traction Company.

Mr. Hardesty, who will be acting

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manager of Mr. Newton's old territory, has been with the Monongahela company since December, 1917, and has been traffic manager since 1921. A department of traffic was created for Mr. Hardesty in 1922. His duties at that time were to control both the local and Parkersburg-Marietta division, the passenger, freight and express traffic. He also was assigned the duty of determining the rate on such traffic and was given supervision and direction of all passenger and freight offices and passenger and freight agents.

Gen. Lincoln C. Andrews Heads All Dry Enforcement

Supervision of the major federal agencies charged with the enforcement of the prohibition act was placed on April 1 in the hands of Gen. Lincoln C. Andrews, New York, receiver of the New York & Queens County Railway and other electric railway lines on Long Island.

Taking oath as an Assistant Secretary of the Treasury, General Andrews was given direct supervision over the prohibition unit, the coast guard and the customs service. All three of these agencies heretofore had been under the supervision of Assistant Secretary Moss.

As noted in the ELECTRIC RAILWAY JOURNAL for March 28 General Andrews has perfected arrangements to hold the receiverships.

A. L. Valentine with Seattle & Rainier Valley Property

A. L. Valentine is now engineer of maintenance of way of the Seattle & Rainier Valley Railway, Seattle, Wash. This position was formerly held by H. L. Hawkins, who was also master mechanic. A. Flannigan now is electrical engineer and master mechanic.

Mr. Valentine's career has been a very active one. When the Seattle Municipal Railway was put in operation he was in charge as superintendent of public utilities of Seattle. In 1886 he was employed by the Puget Sound & Grays Harbor Railroad as a member of the surveying party. For the next three years he was employed at the office of the city engineer of Seattle. Later he became associated with the Port Townsend Southern Railroad as engineer in charge of terminals and subsequently he was associated with the Northern Pacific Railway in connection with the Seattle terminals. During the years that followed Mr. Valentine was connected with the Oregon Improvement Company and the Columbia & Puget Sound Railroad, the Northern Pacific Coal Company and the Great Northern Railroad. In 1904 he was elected to the office of county engineer of King County, Wash., and two years later he was re-elected to this position. In the fall of 1909 Mr. Valentine was appointed superintendent of public utilities by Mayor John F. Miller to fill out an unexpired term, and on Jan. 1, 1910, he was appointed to a full term of three years. He was reappointed for a term of three years on Jan. 1, 1913, by Mayor George F. Cotterill. During 1912 Mr. Valentine was chairman of the Board of Public Works of Seattle.

Alexander Jackson Consultant

Former Head of Time-Table Department of New Jersey Road in Business for Himself

Alexander Jackson has resigned as superintendent of time-tables of the Public Service Railway, Newark, N. J., to go into consulting work for himself in constructing time-tables, making traffic studies and laying out of rerouting plans. All his experience has been along lines concerned directly or collaterally with the work in which he proposes now to engage as an independent consultant.

In his own specialty Mr. Jackson has a reputation that is nationwide. In 1919 he won the American Electric Railway Association medal for the best paper presented before a company section. The award was made to him at the meeting of the association in Atlantic City that year. This paper was entitled "Doing Your Bit." It was published in the ELECTRIC RAILWAY JOURNAL for May 31, 1919, page 1049, under the title "Plain Words on Transportation Service." Several years later Mr. Jackson presented a paper before the Canadian Electric Railway Association that attracted a great deal of attention. This contribution was made to the proceedings of that association in June, 1923. The paper was entitled "A Traffic Survey for Interurban Companies." In it Mr. Jackson outlined his methods of making traffic surveys for time-table study.

Alexander Jackson

Mr. Jackson began his railway career as a conductor in Brooklyn. His first employment was with the Brooklyn Rapid Transit Company, then the Brooklyn Heights Railroad, in 1895. Soon thereafter he was promoted to be an inspector and later began the development of his specialty, when in 1897 he was transferred to the time-table department. He continued in time-table work in Brooklyn until he became chief of this department. In 1903 he resigned from the Brooklyn Rapid Transit Company and went to New Jersey with the Public Service Railway, operating 900 miles of road, to take charge of and standardize time-tables of that company, then recently formed as one of the subsidiaries of the Public Service Corporation of New Jersey. In 1906 Mr. Jackson returned to the B.R.T. as chief inspector of surface lines. There he remained until 1908, when he resigned to return to the Public Service Railway as superintendent of time-tables. If Mr. Jackson had stayed in the business until May of this year he would have celebrated his 30th anniversary of service in street railway work.

He has long been active in the work of the American Electric Railway Transportation and Traffic Association, and in 1905 was chairman of the committee on time-tables and schedules of that body.

United Officials Promoted

Officers of Tri-City Group Advanced to Greater Responsibility Following Expansion of Parent Company

Four officials of the United Light & Power Company, Grand Rapids, Mich., which has taken over important properties in Columbus, Kansas City, Kan., and Lincoln, Neb., have been promoted to positions of greater responsibility. Each of the men has been in an executive position with the United Light for some time past.

R. B. McDonald, general manager of the Peoples Power Company, which operates in the cities of Davenport, Moline and Rock Island, becomes president of the tri-city group of subsidiary companies, a position heretofore held by B. J. Denman. He also becomes first vice-president of the Tri-City Railway & Light Company. He remains in charge of the central station but in addition will have direction over the $2,000,000 steam generating central station which the United Light is completing east of Davenport. Mr. McDonald has risen to this position from a storeroom helper.

HELD MANY IMPORTANT POSTS

In 1899 he secured his first position, clerk in the store room of the public utility company at Lincoln, Neb. Not a college man, but with a natural aptitude for mechanics and electricity, the young man worked up to a position of electrician in the power house at Lincoln.

In 1906, when Frank T. Hulswit, builder and president of the future United Light chain, was looking for a man as superintendent of the Fort Dodge, Iowa, power house, he installed Mr. McDonald in that position. Mr. McDonald was made general manager of the plant in a few years.

He grew in experience and judgment as the corporation expanded and was sent by Mr. Hulswit to the tri-cities in 1917 to take charge of the power plant at Moline, Ill., where he became general manager of the Peoples Power Company.

C. N. Chubb, formerly general manager of the Peoples Light Company, the gas and electric company of Davenport, will become divisional chief of the Iowa and Nebraska properties with

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the title of vice-president of the United Light corporation.

H. E. Littig, promoted to be general manager of the Peoples Light Company, Davenport, has risen from the ranks. Thirty-one years ago he joined the Davenport utility as a conductor and was advanced first to the position of cashier of the Tri-City Railway, then to bookkeeper and rapidly along the line until in 1918 he assumed the rôle of secretary of all the tri-city properties. He continues these duties for the present.

MR. WEEKS A VICE-PRESIDENT

H. E. Weeks, treasurer of the tri-city group and general manager of the securities division of the United Light in charge of customer-ownership and employee-ownership stock, becomes a vice-president of the United Light & Power group with his authority in this department extended to the Nebraska division. Following legislative work in Illinois Mr. Weeks was made secretary of the public utility companies of Alton, Ill. He served in this capacity until 1906, when he was induced by Mr. Hulswit to go with the newly organized United Light Corporation as secretary and treasurer of the tri-city group and vice-president of the Tri-City Railway & Light Company.

Walter Jerome, secretary to L. S. Storrs when he was president of the Connecticut Company, New Haven, Conn., has moved to New York to continue as secretary to Mr. Storrs in his new capacity as managing director of the American Electric Railway Association. Mr. Jerome has worked with Mr. Storrs a number of years.

Howell Ellis, for five years Statehouse reporter for the Indianapolis *Star*, has been named secretary of the Public Service Commission to succeed L. C. Laughry, who is to enter law practice. Mr. Ellis assumed his new position April 1. He is a graduate of De Pauw University, with a master of arts degree.

William Cloutman of the legal staff of the New York Transit Commission has been appointed to have charge of the legal matters relating to the receivership of the New York & Queens County Railway, Long Island City, N. Y., that have been looked after by Gen. L. C. Andrews. H. Pushae Williams, who was appointed by Justice Van Siclen, will continue as counsel for General Andrews, the receiver.

Obituary

J. H. Van Brunt

J. H. Van Brunt, formerly vice-president and general manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., died recently at his home in Kansas City. Mr. Van Brunt resigned from the St. Joseph property in 1920 after 31 years of continuous service. He began his business career with the banking house of R. B. Newcombe & Company, New York, in 1885. Four years later, when Newcombe & Company and other interests purchased the St. Joseph property, Mr. Van Brunt was sent to St. Joseph to take charge of accounts. He was identified with the St. Joseph company in different capacities since that time and up to 1920. In 1902 he was elected vice-president and general manager. At the close of the World War he resigned to engage in business on his own account in Kansas City. In 1918 he was elected president of the Missouri Association of Public Utilities. In recent years he has been operating a radio distributing concern in Kansas City. Mr. Van Brunt was born in Redbank, N. J., in 1868.

V. S. Curtis

Victor Stuart Curtis, secretary and general traffic agent of the Connecticut Company, New Haven, Conn., died at the Bridgeport Hospital on April 6. Mr. Curtis entered the service of the Connecticut Company on Oct. 14, 1914, as secretary. In addition to his duties as secretary on Aug. 1, 1916, he was appointed general traffic agent.

Mr. Curtis was born in Stratford in 1872. He attended the Bridgeport High School and following his graduation joined his father in the express business, later becoming manager of the Bridgeport office of the Adams Express Company. In 1904 he became manager of the Adams Express Company in that city. When the American Railway Express Company took over the express business Mr. Curtis joined the New Haven Railroad official force. Two years later he went to the Connecticut Company.

Mr. Curtis was widely known among electric railway men, particularly in New England.

E. J. Bagnall

E. J. Bagnall died on March 16 in Cleveland, Ohio, at the age of 67 years. He was one of the pioneers in the electric railroad and electric light industries. Mr. Bagnall was connected with the Brush Electric Company, Cleveland, prior to 1880 and shortly afterward formed the firm of Bagnall & Dutton, which took over, managed and operated the Brush electric light station in St. Louis, the first electric light station in that city. He changed this plant from a failure to a success.

Later he was associated with the street railways at St. Louis, tested and disapproved the storage battery system, installed and tested the Short system of railways and then installed a section of the present system on Finney Avenue, the first permanent electric railway in St. Louis, now part of the United Railways. He also designed and built the first electric railway power house in St. Louis. For this work he was obliged to develop many important appliances for the station, the line equipment and motor control.

After completing this work he returned to Cleveland and organized the Adams Bagnall Electric Company, which developed the A-B arc lamp, recognized as in a class by itself until all arc lamps were superseded by the tungsten lamp.

James Collins Jones, general counsel for Day & Zimmermann, Philadelphia, Pa., and managed properties, including the Lewiston & Reedsville Electric Railway, the York Railways, York, Pa., and about twelve other utilities, died on March 14, after a short illness, from double pneumonia.

I. B. Sager, veteran member of the staffs of the East St. Louis & Suburban Railway and the East St. Louis Light & Power Company, East St. Louis, Ill., died on March 20. Mr. Sager was a pioneer in the East St. Louis territory. He built the city's first light and power plant back in 1889. His plant was on the Mississippi River front and was intended primarily to furnish current to freight depots and railroad offices along the levee. When the East St. Louis & Suburban interests bought his power plant Mr. Sager joined that organization and remained a member of the staff up to the time of his death. He was 68 years old.

Major Fred Coutts, long identified with the British tramways, died on March 10. For nearly 20 years he was engineer and manager of the Paisley & District Tramways Company. When the undertaking was bought by the Glasgow Corporation a year or two ago Mr. Coutts was appointed manager of the Dearne Valley Light Railway (Yorkshire). This system was constructed by a combination of local authorities, and was opened for traffic in July of last year. Soon after that Mr. Coutts was appointed general manager of the Yorkshire Electric Tramways and the West Riding Automobile Company.

John Allison Smith, who served the Boston Elevated Railway, Boston, Mass., and its predecessors for 31 years, died on March 14. Mr. Smith was born on Feb. 28, 1868, and entered the service of the West End Street Railway as conductor in 1888, but was obliged to resign on account of serious illness; he returned again as conductor on June 21, 1893. He became starter in 1896, was appointed chief clerk of division nine in 1897 and on Nov. 1, 1907, he was made superintendent of division nine. On Nov. 1, 1919, he was appointed assistant to the superintendent of transportation and on July 1, 1924, was assigned as assistant to the supervisor of time-tables.

Milton Sanford Barger, general treasurer of the New York Central Lines and treasurer of the Ontario Light & Traction Company, the New York & Harlem Railroad and the New York State Railways, Rochester, N. Y., died aboard the steamship *Berengaria* recently while he was en route to Europe on a pleasure trip. After his graduation from Harvard, Mr. Barger followed in the footsteps of his father, Samuel F. Barger, who was a director of the New York Central, and established himself with the same organization. In 1902 he was appointed assistant treasurer of the New York Central & Hudson River Railroad, and was made treasurer of the Harlem Road four years later, and treasurer of the Central Lines West of Buffalo, in 1912. During the federal control period Mr. Barger was treasurer of all Central Lines. He was born in New York City on Feb. 24, 1875. Dutch and Huguenot ancestors of his settled in New York early in the seventeenth century.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Final Road Tests of Gas-Electric Bus

Details of Chassis Design for Mounting Electrical Drive Units Include a Number of Ingenious Innovations—Fuel Consumption Lower than on Mechanical Driven Unit

FINAL road tests on the first of the 200 gas-electric buses ordered by the Philadelphia Rural Transit Company from the Yellow Coach Manufacturing Company have been completed at the manufacturer's plant in Chicago. These tests have been exhaustive and are said to have demonstrated several advantages of this type of construction from the standpoint of quietness, simplicity of control, smooth acceleration and fuel economy resulting from a more nearly uniform engine speed than is obtained in a mechanical drive vehicle.

The general features of the new design were described in the Dec. 13, 1924, issue of ELECTRIC RAILWAY JOURNAL and in an article by J. A. Queeney of the Philadelphia Rural Transit Company outlining some of the considerations which led up to the adoption of the gas-electric unit published in the Jan. 24, 1925, issue. Additional details are now available as the result of the manufacturer's final road tests and the completion of the design of chassis and body.

The drive from the six-cylinder, 4¼-in. x 5½-in. sleeve valve engine, developing 108 hp. at 2,200 r.p.m., to the 25-kw. generator is by a propeller shaft extending through the hollow generator armature shaft. Thus the generator is driven from the rear end of its shaft through a new type of rubber ball universal joint. A similar type of universal is used at the front end of the propeller shaft. The armature shaft is carried on ball bearings. This type of drive was developed to permit torsional flexure, thus relieving the generator of engine torque impulses. In comparison with a close coupled connection between the engine and generator, this arrangement is expected to prevent excessive wear and stress on the rear crank shaft bearing on the engine, which might result from lack of alignment between the two units.

CHANGES IN CHASSIS DESIGN

Application of the electric drive to the Yellow Coach type "Z" chassis necessitated many changes, amounting to practically a new vehicle. This included slight modifications of the steering gear, a complete new frame and various changes to the rear axle. No changes were required in the radiator, engine or front axle.

With a 900-lb. generator mounted just back of the engine a cross-member at this point in the frame to which the unit could be attached was required. This cross-member is of the Yellow Coach standard tubular type. Two lugs on the tube support the generator at its forward end, and a drop-forged openwork girder supports the rear of the generator in a single bearing. This gives three-point suspension and allows the generator to be removed from the chassis by lowering it.

Similar mountings are used for the two motors. A tubular cross-member provides a support for a lug at the forward end of each motor, while a channel sill furnishes a two-point fastening for each motor at the rear. They may be lowered out of the chassis by disconnecting the driveshaft and removing three bolts on each motor.

In the rear axle the differential is eliminated and a dual worm drive is used. The housing is a one-piece double banjo type drop forging. The gear reduction is 11:1. The semi-floating driveshafts have a maximum diameter of 4 in. Dual brake equipment, similar to that used on the standard "Z" chassis, is used. Both brakes operate directly on the rear wheels. The shoes are 5 in. wide, while the drum diameter is 21 in., giving a brake surface area of 659 sq.in.

The long wheelbase of 230 in. required modification of the steering mechanism to reduce the turning radius. The chassis channels are 4 in. x 10 in. section. A height of 20 in. above the ground is obtained by dropping the frame just back of the engine and giving it a kick-up over the rear axle. The frame side members are extended beyond the rear axle a sufficient distance to carry the rear platform on a double-deck bus. This gives a continuous frame length of 30 ft. The chassis is a self-contained unit in so far as the power, control and wiring are concerned. The controller is mounted on the outside of the frame to the left of the driver's seat and the motion from the control handle to the drum is transmitted through bevel gears. The control lever quadrant is in the floor board. This has four positions, namely, forward, neutral, braking and reverse. The importance of maximum accessibility and ease of dismantling has been particularly borne in mind throughout the design. All wiring is inclosed in flexible metal conduit and is fastened to the chassis by insulated cleats. Connections at the motors and generator are made by flat terminal joints.

For both single and double deck bodies the same type of chassis is used. The double-deck design seats 67 passengers, 39 on the upper deck and 28 on the lower. The rear end is entirely inclosed, while the upper deck is semi-inclosed. There is also a forward entrance door to the lower deck, so that by keeping the rear door closed the bus may be operated by one man. A folding door inside the rear vestibule shuts off the staircase to the upper deck. Doors are arranged to close air-tight with molded rubber on the edges, which fit into specially designed channels at the posts. They are supported on ball-bearing mounted shafts. The upper deck floor is a self-supported member of ⅝-in. Haskelite, reinforced at the aisle by three ½-in. boards. Diagonal floor strips cover the upper deck floor with the exception of the aisle, where the strips run lengthwise. The upper deck roof is similar to the type used in Detroit and Chicago.

Lower deck seats are upholstered in leather. Interior finish of both upper and lower decks is mahogany.

Illumination on both decks is provided from a specially constructed 550-watt generator. Brass sash are used both above and below and are arranged to lower into side pockets.

Single-deck bodies seat 33 passengers on leather upholstered cross seats. On both double and single deck bodies the floor over the generator and brake adjusting mechanism is a one-piece aluminum casting ⅜ in. thick. Trapdoors in this allow access to the brake adjusting levers and to the commutator of the generator. By entirely removing this floor plate ample room is provided for disconnecting and lowering the generator. All side posts, letterboards and other exterior woodwork are covered with sheet aluminum.

FUEL ECONOMY INDICATED

The road tests recently completed indicate a fuel consumption below that of a gear-driven bus of the same size and type. Acceleration up to 25 m.p.h. is obtained in 25 seconds, making an average rate of 1 m.p.h. per second. At lower speed the acceleration is still better. Ten miles per hour is obtained in five seconds, or at the rate of 2 m.p.h. per second. These figures were obtained from tests on a loaded chassis, the total load being 20,000 lb., which is considerably in excess of a fully loaded single-deck bus.

At idling speeds of the engine, that is, below 400 r.p.m., the voltage generated is so low that only a negligible flow of current takes place through the motor. It is therefore possible to have the generators and motors connected at all times. Under this condition the controller handle is in the forward position. As a safety measure a neutral position is provided in the controller to open the electrical connections.

With the controller in the forward position the bus is started and accelerated simply by opening the engine throttle. Due to the differential winding of the generator, the electrical characteristics are such that as the load required by the motors decreases as balancing speed is approached, the voltage rises. This increased voltage, combined with the decreased torque requirement, still further increases the speed of the motors. Since the rate of acceleration of the bus is predetermined, regardless of how suddenly the throttle is opened, the engine cannot be stalled during the operation of acceleration.

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Cars Damaged in Fire in Bronx

Forty-nine cars were partially burned in a fire at the West Farms carhouse of the Union Railway at 174th Street and Southern Boulevard in New York City on April 6. The damage to the equipment and building is estimated at $200,000. The cars will be rebuilt.

Fortunately the fire was confined to a strip of the roof which burned straight through the center of the building. The walls and the floor are intact. The carhouse will be rebuilt for temporary use.

The employees of the company handled the fire most creditably. At its start they attacked the blaze with chemical extinguishers and small hose lines, and although four alarms were sounded and most of the fire apparatus in the Bronx responded for service, the early work of the railway's own men in combating the blaze is credited by company officials with helping materially to keep the fire from getting beyond control.

Tests Made of Catenary Material at Erie

During the past several months the Anaconda Copper Mining Company, New York, N. Y.; the American Steel & Wire Company, Chicago, Ill.; the Aluminum Company of America, Pittsburgh, Pa., and the Copperweld Steel Company of New York, N. Y., erected at Erie, on the right-of-way of the East Erie Commercial Railroad, four distinctly different kinds of catenary material for an exhibition and test held on April. 9. The General Electric Company furnished the facilities and equipment. Three companies put up two spans each and the Aluminum company four spans. The different types of material used included hard drawn copper and phono-electric. In the case of the Aluminum company the catenary supporting wire was steel cored aluminum. All of the fittings and the lacing wire were of aluminum. The tests included collection of heavy current, and were made under actual working conditions. Elaborate precautions were taken to insure data on each installation without any influence from the adjoining spans. The installation will be permitted to remain in place over the tracks to determine the relative deterioration.

Westinghouse Merchandising Department Moves to Mansfield

All activities of the merchandising division of the Westinghouse Electric & Manufacturing Company will hereafter be directed from Mansfield, Ohio. J. S. Tritle, manager of the merchandising department of the company, will become general manager of this department. Mr. Tritle has moved his headquarters, with his entire staff, from New York to Mansfield. The majority of the articles comprised in the merchandising department are produced at the Mansfield works.

Heretofore the engineering and manufacturing operations have been supervised by officers at East Pittsburgh, while the sales activities have been directed from the merchandising headquarters in New York. All engineering work will now be conducted in Mansfield under the supervision of Mr. Tritle. Those engineers at East Pittsburgh who have been engaged on the products made in Mansfield will be moved to the Ohio plant. It has been recognized for a long time that such a change was desirable in order to obtain unified effort in the conduct of the business.

Growing Demand for High Grade Mica

For a large part of its supply of mica industry in the United States is essentially dependent upon foreign sources. Both for quality and quantity of its product India easily ranks first among the world's producers of mica. The best Indian muscovite mica is red in color and for this reason is known as ruby mica. This mica is unsurpassed anywhere for its ability to withstand high electrical pressure.

The importance of mica to the industrial world lies principally in two properties—it divides naturally into thin even sheets of considerable strength and flexibility and it is not only an excellent electrical insulator but makes such insulation safe by offering great resistance to heat. Whereas total world production of mica in 1890 was valued at only $250,000, the value of this mineral handled in the markets of the United States alone in 1923 was more than $2,800,000. Imports of mica into the United States in 1923 both in quantity and value were nearly four times the average of the five years immediately preceding the outbreak of the war in Europe. According to the National Bank of Commerce, New York, total mica imports into the United States in 1924 were somewhat less than those of 1923, but the amounts were still large. The United States has recently been taking about half the exports from British India, or from three to four times its average pre-war takings in that market, and is at the same time importing about 340,000 lb. of mica yearly through Great Britain, most of which is probably Indian mica. Next to those of India, the deposits of Canada offer the most important foreign source of the mica consumed by the electrical industries of the United States.

The growing demand for mica of the better grades has given rise to increased interest in sources of supply hitherto little used. A large part of this interest has been devoted to the mica fields of Africa, where it has been found possible to obtain considerable quantities of high-quality mica at an advantageous cost level.

The mining of mica is to a large extent a highly speculative industry and is surrounded by greater economic hazard than obtains in almost any other mining operation. The occurrence of this mineral is most irregular and there are no rules to guide the prospector.

During the war production of mica was stimulated in South America and although the output fell off sharply with the end of the wartime demand there is still a considerable quantity of high grade sheet mica available from this source.

Studebaker to Build Buses

A. R. Erskine, president of the Studebaker Corporation, at the annual meeting on April 7, said that more than 1,000 Studebaker big six chassis carrying special bus bodies are in daily operation on bus lines in all parts of the country. According to him the Studebaker engine has been found to be particularly suitable for these demands and the company is planning to put into production a specially designed long wheel base chassis for bus work.

March sales were 14,923 cars against 12,398 last year. Sales in the first quarter were larger than for the corresponding period last year. Mr. Erskine said that production in the second quarter would be 40,000 cars, and that export sales have shown from 50 to 100 per cent increase each month since last September.

Paul G. Hoffman and F. W. Longfellow were elected directors to fill vacancies. Mr. Longfellow succeeds the late Frederick P. Delafield. Mr. Hoffman also was made a member of the executive and finance committees, as well as vice-president in charge of sales.

Heater Company Wins

According to the final decree of the United States District Court, the St. Louis Pneumatic Devices Company is enjoined from manufacturing or selling apparatus covered by the patents of the Consolidated Car Heating Company. The decision to this effect was handed down by Judge C. B. Faris of the Eastern Judicial District of Missouri on March 27. The court found that the defendant, J. M. Dapron, doing business under the name of the St. Louis Pneumatic Devices Company, had infringed upon the patent granted to J. M. McElrow, later sold to the Consolidated Car Heating Company. It was further ordered by the court, the plaintiff agreeing, that no damages should be paid by the defendant.

Manufacturer Co-operation

An example of co-operation between the manufacturer and the electric railways was shown on a card inclosed with dividends of the Ohio Brass Company, Mansfield, Ohio. The card read:

Whenever you pick up, in your automobile, a person waiting for a street car, you incur a legal liability and reduce the revenue of an electric railway—one of our customers who helped make this dividend possible.

Metal, Coal and Material Prices

Metals—New York	April 7, 1925
Copper, electrolytic, cents per lb	13.587
Copper wire base, cents per lb	15.75
Lead, cents per lb	8.15
Zinc, cents per lb	7.48
Tin, Straits, cents per lb	51.125
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.35
Somerset mine run, Boston, net tons	2.125
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.65
Weatherproof wire base, N.Y., cents per lb.	18.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.12½
Turpentine (bbl. lots), N. Y., per gal	0.98

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Rolling Stock

Toronto Transportation Commission, Toronto, Canada, is now rebuilding the 160 remaining pay-enter cars taken over some time ago from the Toronto Railway. These are being converted into front-entrance, pay-leave cars. When the change has been completed all motor cars will be front entrance. Trailers for these trains will be of the same type as those used in Montreal with the exception that they will be equipped with automatic rear exit doors.

Gary Street Railway, Gary, Ind., recently ordered five new single-truck safety cars. The specifications follow:

Date order was placed	Feb. 17, 1925
Date of delivery	April 10, 1925
Builder of car body	McGuire-Cummings Manufacturing Company
Type of car	One-man safety double end
Seating capacity	24
Length over all	30 ft. 2½ in.
Truck wheelbase	8 ft. 0 in.
Width over all	8 ft. 0 in.
Height, rail to trolley base	10 ft. 2⅞ in.
Body	Semi-steel
Interior trim	Mahogany
Roof	Arch
Air brakes	General Electric Company
Axles	3 in.
Car signal system	Electric
Car trimmings	Bronze
Couplers	1¼-in. round draw bar
Curtain fixtures	Rexall metal rollers
Curtain material	Pantasote K-2 color No. 86
Destination signs	Illuminated
Door-operating mechanism	Pneumatic
Fenders	HB lifeguards
Heaters	Twelve truss plank
Headlights	Incandescent with dimmers
Journal boxes	3-in. x 6-in. MCB
Motors, type and number	Two GE-258
Enamel	Old Dutch
Registers	Ohmer
Seats	Five wood cross-seats on each side
Springs	Quarter elliptic hung on coils
Trolley base	Ohio Brass Company
Trucks	McGuire-Cummings No. 90
Wheels	26-in. rolled steel

Southern Public Utilities Company, Charlotte, N. C., has ordered six double-truck one-man cars for use in Greenville, S. C. The new equipment will be larger than the present one-man cars.

San Francisco Municipal Railway, San Francisco, Cal., has not yet decided on the plans for the fifteen new cars it has in mind to purchase. The new cars are badly needed, but the supervisors have not yet found time to act upon the question of their design. It is thought that the cars will be of a type similar to those on the Geary Street line. These are semi-steel, each with a seating capacity of 50.

Springfield & Xenia Railway, Springfield, Ohio, has ordered three new combination passenger and smoking interurban cars from the St. Louis Car Company.

Seattle Municipal Railway, Seattle, Wash., will purchase two new buses for use on Empire Way. An appropriation of $12,000 was authorized for this equipment.

Southern New York Railway, Inc., Oneonta, N. Y., suffered the loss by fire of eight cars and all the machine shop tools. The damage, partially covered by insurance, is estimated at upward of $100,000.

British Columbia Electric Railway, Vancouver, B. C., is reported to have placed an order with a British firm for eight underslung buses to be constructed in England and shipped to Canada for assembly.

United Railways & Electric Company, Baltimore, Md., through its subsidiary, the Baltimore Transit Company, purchased five additional buses since the recent acquisition of the East Fayette Street Bus Company. It is expected that six more will be bought.

Hot Springs Street Railway, Hot Springs, Ark., has purchased two new Reo motor coaches of the latest model 21-passenger type. The coaches will be delivered April 20.

Evansville & Ohio Valley Railway, Evansville, Ind., has ordered five combination interurban cars from the American Car Company, St. Louis.

Gary & Hobart Traction Company, Hobart, Ind., recently placed an order with the G. C. Kuhlman Car Company for three light-weight interurban cars each with a seating capacity of 44.

Kansas City Railways, Kansas City, Mo., has estimated that it will have to purchase 63 buses in order to meet the terms of the new bus franchise granted to it on April 7. Both single and double deck buses will be required.

Illinois Power Company, Springfield, Ill., has placed an order for three 25-passenger Mack city-type buses.

Track and Line

Montreal Tramways, Montreal, Que., includes the construction or reconstruction of 54 miles of tracks in the 1925 program now before the city, the company and the Tramway Commission's engineers. At least 30 miles of track will be laid during the 1925 season.

Eastern Massachusetts Street Railway, Boston, Mass., has received bids for the reconstruction of 5,600 ft. of railway track on Hancock Street in Quincy, Mass.

Southern Public Utilities Company, Charlotte, N. C., will re-lay the curve of the track from North Main Street into College Street in Greenville, S. C.

Power Houses, Shops and Buildings

Toronto Transportation Commission, Toronto, Canada, has begun excavation for a two-story garage to be built on its Hillcrest property. It is planned to provide facilities now for the accommodation of 90 buses. Ultimately these quarters are to be extended to take care of 200 buses.

Portland Electric Power Company, Portland, Ore., has begun construction of a two-story brick and concrete addition to the Jefferson Street substation. The building, including the installation of electrical machinery and equipment, will cost between $90,000 and $100,000. Ground was broken in March and it is expected to have the structure completed in 90 days. The project became necessary because of a rapid demand for both direct and alternating current service on the west side, this substation being the tie-in plant between the east and west side power supply. This service includes the 600-volt direct current for operating the railway department on the west side.

Trade Notes

National Paving Brick Manufacturers Association, Cleveland, Ohio, through its board of governors, elected officers at its regular quarterly meeting on March 17 at Cleveland. W. P. Whitney, president of the Springfield Paving Brick Company, Springfield, Ill., was elected president of the association for the ensuing year. Other officers of the association were re-elected.

Electric Service Supplies Company, Philadelphia, Pa., has increased its sales force to include J. H. Spraggon, who for twelve years has been connected with the Westinghouse Electric & Manufacturing Company in various capacities. For the last six years Mr. Spraggon has been selling in the New England territory for the Westinghouse company.

Standard Scale & Supply Corporation, Pittsburgh, Pa., has announced that R. H. Chappel was recently elected treasurer and general manager. This corporation is entirely new and separate from the old Standard Scale & Supply Company of Beaver Falls, which is out of existence. It manufactures railroad track and truck scales, the narrow drum concrete mixer and handles contractors' equipment in general. Branch offices, warehouses and stores are located in Pittsburgh, New York, Philadelphia, Chicago and Cleveland.

W. N. Matthews Corporation, St. Louis, Mo., elected directors at the annual meeting of the stockholders on March 3. They are W. N. Matthews, Claude L. Matthews, James R. Kearney, M. C. Cooley and C. C. Fredericks. At the annual meeting of the board of directors, held on March 11, the following officers were elected: W. N. Matthews, president; Claude L. Matthews, vice-president and treasurer; James R. Kearney, vice-president and manager electrical sales, and M. C. Cooley, secretary. C. C. Fredericks, formerly vice-president and general manager, has left its employ. The company announces that its affairs were never in better condition and it looks forward to a good business for the balance of the year.

General Electric Company, Schenectady, New York, through the Edison Lamp Works of Harrison, has issued a 50-page bulletin entitled Adequate and Efficient Motor Bus Lighting. The booklet, which is illustrated, gives some facts on the evolution of the motor bus and includes a summary of lighting conditions as found in buses during 1923.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., has announced that as W. G. Willcoxson is no longer connected with the company, it will be temporarily represented in Chicago territory by F. O. Bailey, manager of sales, and A. D. Stuver.

Six Wheel Company, Philadelphia, Pa., manufacturer of the Safeway six-wheel motor coach, has announced the appointment of C. Eustace Dwyer as general sales manager and A. P. Warner as assistant general sales manager.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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Repair Equipment Parts Before Excessive Wear Occurs

IN DISCUSSING maintenance methods at a recent association meeting one speaker showed that maintenance costs are often increased by keeping parts in service when they should be repaired. By removing parts in time they can be reconditioned, while if allowed to remain in service too long they destroy themselves and an entire replacement is necessary. Wear resulting from looseness has been found to increase very rapidly with the amount of movement so that the more parts have become worn the faster is the subsequent wear.

With the present extended use of welding for building up worn surfaces and the well-known economies of such methods there is little excuse for allowing parts to become excessively worn. Equipment parts are now considered as scrap only when they have reached such a condition that it is no longer economical to reclaim them by welding.

All departments of the railway can economize through such reclamation of worn parts. Perhaps the largest field of usefulness is in connection with rolling stock maintenance. Many companies have determined definitely that they obtain large reductions in equipment defects and troubles through their ability to keep parts tight by welding and remachining. Loose bearings in housings and motor frames and loose outside fits for housings have caused many bearing troubles. There is no longer an excuse for shimming up such parts in order to secure a temporary tight fit which soon loosens and results in increased trouble. One armature damaged so that rewinding becomes necessary will cost as much as the welding and remachining of many housings and bearings.

In making all repairs one important point is to make them before excessive wear has occurred. By doing so repair costs are cut and the best reclamation results.

Blaming the Other Fellow Will Not Eliminate Noise

REDUCING as much as possible the noise of car operation is now widely recognized by electric railway men as highly desirable. A certain tendency exists, however, to transform this commendable effort to improve transportation service into an excuse for backhanded criticism of those responsible for existing conditions. The way engineer is inclined to argue that the real trouble is that the rolling stock is not properly maintained. On the other hand the master mechanic is likely to believe that the trouble is with the track.

So long as activity in the direction of reducing noise is limited to the pot calling the kettle black, little progress will be made. Neither track department nor mechanical department is wholly to blame, nor is either one altogether blameless. In reality the noise may result in part from defects in track, in part from defects in cars, and also from certain features in the original design of roadway and rolling stock.

Too much adverse criticism should not be directed at those responsible for designs made a number of years ago, for the subject of noise reduction was not generally considered of much importance until recently. To improve matters now plenty of opportunities are available for use by both mechanical and track departments. Let each do what it can within its own field. Special attention to methods of eliminating noise is being given by both the equipment and way committees of the American Electric Railway Engineering Association. Their reports undoubtedly will be helpful in pointing out ways to attain this end.

Waste Elimination in Industry a Matter of National Importance

MUCH good should come from the conference held by the National Civic Federation last week, and which is reported elsewhere in this issue. Waste elimination and the minimizing of industrial controversy, the subjects discussed by Herbert Hoover, Gerard Swope and William Green, reach down to the essentials of all modern industry. As Mr. Hoover clearly pointed out, the elimination of industrial wastes provides the greatest opportunity for an increase in wages and higher standards of living for the worker. Looking at it directly from the viewpoint of the electric railway industry, greater efficiency means an increased production per man employed. This in turn means reduced operating expenses, higher wages, or both.

One of the places where the greatest gain in manefficiency can be made is in the electric railway shop. With the wide range of operations in car repair work it is not surprising that there is a large waste of labor. It is not, however, impossible to reduce this form of waste greatly. Standardized methods, organization of repairs so that the same operation can be performed many times in succession, either by allowing a certain job to accumulate or by the production of a number of like parts in advance of the need for them, correct shop layout and efficient routing of work, are all ways in which an increase of output may be obtained.

Another phase of waste elimination that was discussed at the conference is reduction of idle time due to industrial disputes. There have been many such in the street and electric railway industry in its 40 years of existence. Deplorable as such clashes are in general, they are even worse in the electric railway industry, for they deprive the men of their wages, the public of needed service and the company of needed revenue. Unlike many manufacturing businesses, such losses can never be made up. Particularly at this time, when the United States Supreme Court has just decided that con-

This is the issue in April that is devoted essentially to maintenance subjects

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trol of labor such as was contemplated by the Kansas Industrial Court is unconstitutional, any action looking toward greater stabilization of labor is to the advantage of all parties.

Conformity to Existing Details Should Be Considered in Design

ADVANTAGES of new equipment, great as they are, could often be enhanced by considering the matter of conformity in certain details, with existing designs. A criticism frequently heard, is concerning the lack of interchangeability of parts with equipment now in service. A recent order for car equipment specified a type of motor brought out fifteen years ago. Inquiry as to the reason for this choice developed the fact that this railway had but one type of motor, although it was operating 500 motor cars. Officials of this road considered the advantages of uniformity as outweighing the advantages of improved design.

Larger parts of railway motors, such as frames and housings, are seldom replaced, and interchangeability with existing equipment is of no particular advantage. But repair parts such as armature coils, commutators, brushes, brush-holders, field coils, bearings, gears and pinions must be kept on hand in considerable quantities for replacement. Any reduction in the number of types that have to be carried in stock is a great help. Several railways have rehabilitated their motors with a view to reducing the number of types of bearing. Others have made wholesale changes in gear ratio so as to provide uniform gearing. These small things might have been taken care of in the original design without decreasing the number of valuable new features, had the matter been studied in that light.

A number of things that may be considered as auxiliaries to the motors are affected by the design. Among them are motor suspensions, connectors for motor leads, lengths of motor leads and the position on the motor where they are brought out. Uniform arrangement of such details by the motor manufacturers would do much to reduce the number of parts carried in stock and also provide a uniformity that will speed up repairs. Along with the desire to have improved equipment there is a feeling among the railway men responsible for maintenance that much can be done with advantage toward securing greater uniformity of small parts.

Municipal Ownership Fails to Attract Votes

ON THE same day proposed local transportation ordinances were recently turned down by overwhelming votes in both Chicago and Milwaukee. The two ordinances were quite different in plan. There was, however, one point of marked similarity—both provided for ultimate ownership of the lines by the cities.

The Chicago ordinance was called municipal ownership because title to the lines was to pass immediately to the city. Operation, however, was to have been in the hands of a board on which both the city and the security holders would have been represented. As pointed out in ELECTRIC RAILWAY JOURNAL for March 7, this board was designed to curtail the political patronage dispensers, at least until such time as the city actually obtained controlling representation on the operating board. This period was variously estimated at from 25 to 40 years.

From the standpoint of the electric railway industry as a whole, the greatest danger in the ordinance offered to Chicago by its Mayor lay in the municipal ownership label. Those enthusiasts who see in municipal ownership of utilities some magical method of changing human nature so that the mixing of local government with business will produce efficiency would have been quick to claim Chicago as a convert to their cause. In Milwaukee, while no stretching of definitions would have justified use of the municipal ownership label, provisions for ultimate municipal acquisition of the lines occupied a prominent place in the plan.

Chicago has generally been considered to contain a strong sentiment for municipal ownership. Even the ordinances, adopted in 1907, under which the Surface Lines operate, contain specific provisions covering municipal purchase of the lines. Milwaukee is a community of strong socialistic sentiment.

Both ordinances were overwhelmingly defeated, even though from the standpoint of the car rider they contained many desirable provisions. The inference from this is obvious. The municipal ownership hobby in these cities at least is apparently joining the remainder of the equine family as an obsolete factor in municipal transportation.

Modern Machine Tool Equipment May Effect Substantial Economies

METHODS used to carry out various shop processes depend largely on the machine tool equipment available. For example, many railway shops are without power punches. In such shops, as a result, many operations are performed on drill presses that could be carried out much more quickly and economically were a power punch available. To cite another illustration, pneumatic hammers are not found in railway forge shops to the extent that they should be, and much hard work is necessary. The men directly in charge of maintenance nearly always realize the value of and need for such machine tools. But as new tools must be charged to capital account, many railway executives feel that they cannot finance the added expenditure, failing to see that operating savings would soon equal the first cost.

As a prerequisite to obtaining proper attention from the executive, information is needed to determine the extent of the economies that will result from the use of new machine tools in electric railway maintenance work. Few companies keep detail costs. As most tools are used on a large variety of work and any specific operation is not performed over and over, it is hard to make a concrete estimate of the cost of individual operations.

Many machine tools used by electric railways are also of an old type that should be replaced. A survey made by this paper a year ago showed that 40 per cent of the machine tools used in the industry are more than twenty years old. If master mechanics would list their machine tools which are in this twenty-year classification, and figure the cost of producing on such tools some of the particular jobs that are done most frequently, comparisons of the cost of doing the same work with modern tools could be made. By taking into consideration capital charges on the investment proposed and making allowance for time consumed in necessary idleness an accurate idea of savings would be established. Analysis of these costs should help materially in convincing executives of the need for new equipment, and with such information available it is certain that the purchase of many machine tools would be justified.

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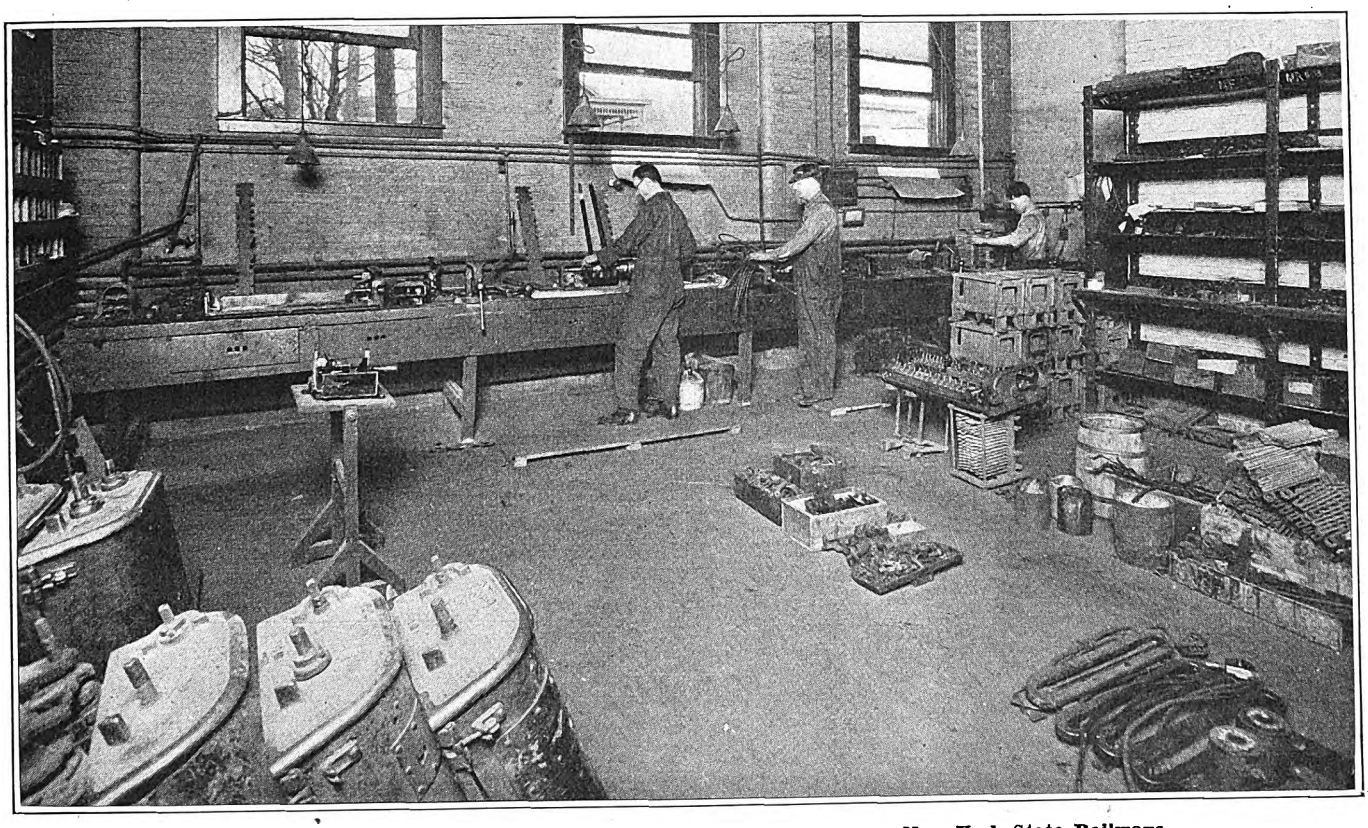
Modernizing Platform Controllers

K Type Hand Controllers Are Being Rebuilt by the New York State Railways to Include Late Improvements of Manufacturers—Wiring Is Increased in Size—New Type Contacts and Shunts at Fulcrums of Cut-Out Switches Are Installed —Special Jigs and Fixtures Used in the Work



Controller Overhauling Department at Wolf Street Shops, Syracuse, New York State Railways

RECONSTRUCTION and overhauling of controllers has been systematized for all the various shops of the New York State Railways. A definite program for doing maintenance work on controllers was started two years ago at the Wolf Street shops, Syracuse. About 65 per cent of the controllers for cars maintained at those shops have now been given this extensive rehabilitation.

Controllers are removed from cars that come in for general overhauling, and in addition from other cars which are in for repairs as fast as the work can be taken care of in the controller department. The various types of controllers in service on the company's properties include K-6, K-10, K-12, K-28 and K-35. While the work naturally varies with the type all controllers are entirely dismantled. The frame is scraped and cleaned carefully and is lined with asbestos, which is shellacked on so as to hold it firmly. Cover hinges and bolts which have become bent are straightened. Any bolts with stripped or badly worn threads are replaced. The bearings for the drum shafts are brought back to original size either by bushing or by welding and reboring. Pawl fulcrums and rollers are gone over and if worn they are replaced. New springs are installed throughout. Finger bases are removed from the contact blocks and dipped in a bath of sulphuric acid. Wooden contact blocks found in good condition are scraped, cleaned and painted with orange shellac for reuse. Molded types of contact blocks are cleaned of all carbonization. In replacing the finger blocks, holes over heads of screws are plugged with asbestos to overcome danger of short circuits or grounds.

Controller Wiring Standardized

All connections in the controllers are replaced with new stranded, weather-proof insulated cable. For resistor and reverse connections the equivalent of No. 6 wire is used. Leads to finger bases and terminals for main motors are of No. 4 equivalent wire, ground leads are No. 3 and trolley leads No. 2.

On the older types of controllers some trouble has been experienced from overheating of the contacts and fulcrums of cut-out switches. In some cases this heating has been sufficient to melt the solder at terminals, allowing the leads to loosen and cause open circuits. An improved type of contact for these switches, which was developed by the railway for K-28 controllers, is now being furnished by the General Electric Company. This provides double the amount of contact surface that the old clips had and provides increased spring tension on the contacts. Phosphor-bronze spring washers are also used at fulcrum points. These washers keep the springs tight and provide increased contact surface.

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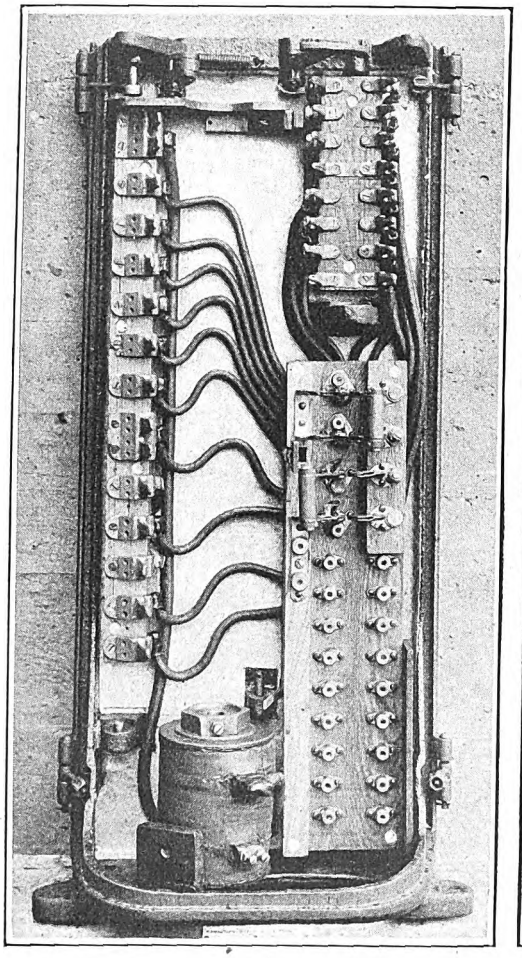
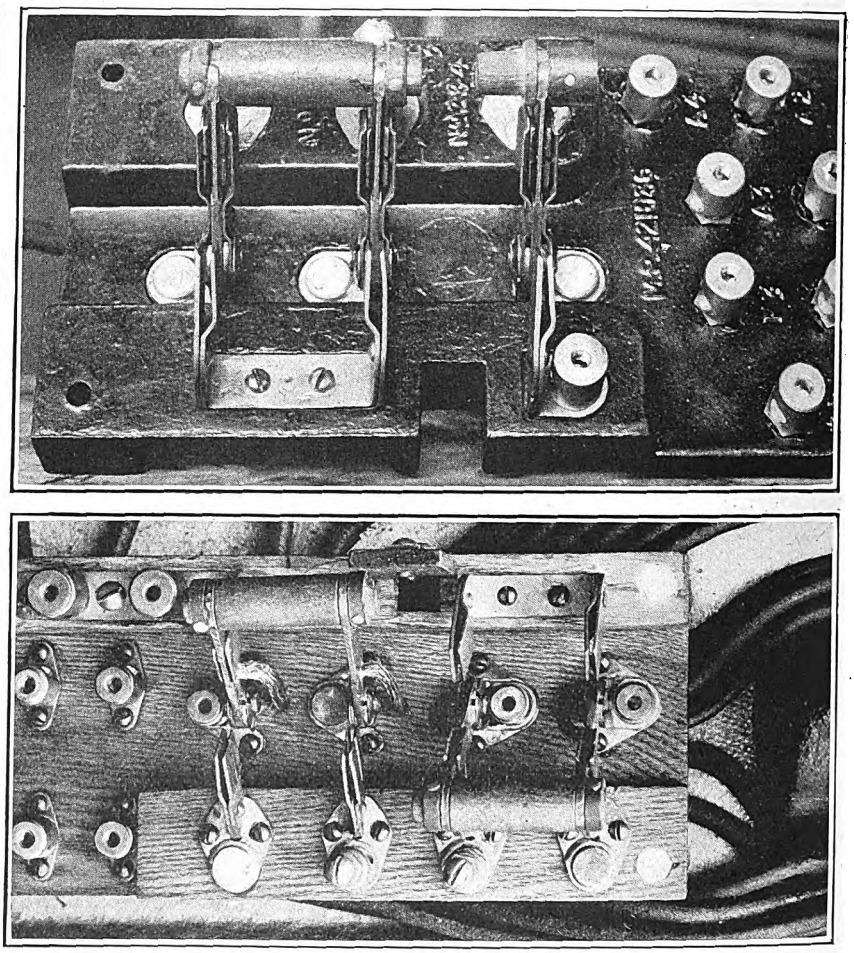
A molded type of connection board is being installed in K-28 controllers. Braided shunts are being installed around the fulcrums of K-6 cutout-switch blades and spring washers are also added. The shunts are brazed to the contact blades at one end and to the fulcrum base at the other.

Standard practice of the railway is to use reversible trigger-lock fingers. Weak or burned finger springs are replaced and the contact portion is dressed up so as to make a good contact across the entire width. Arc shields and arc deflectors, if in good condition, are scraped, filed and buffed. Holes and uneven surfaces are repaired with Westinghouse No. 521 arc cement. New arc deflectors replace any that cannot be repaired satisfactorily.

Blow-out coils are removed and tested with a Century testing outfit. If the test shows any turns to be short circuited, the coils are torn down and the entire winding is reinsulated. After the coils are rewound they are again tested with the Century testing outfit.



Controller Frame with Finger Blocks and New Wire in Position



At Top, Improved Type of Contacts for Cut-Out Switches. At Bottom, Braided Shunts Installed Around Fulcrums of Cutout Switches

Rebuilding Controller Drums

All controller drums are rebuilt. The standard practice of the railway is to use hexagonal shafts with K-6, K-28 and K-35 controllers and a round shaft with one side flat for K-10 and K-12 controllers. The body castings for the drums are cleaned and sand blasted. On K-35 controllers when the circuit is opened the arc formed has a tendency to follow down to the body casting and burn underneath the contact segments. This leaves the front ends of the segments without support. Body castings that have become weakened in this manner are built up by brazing with an acetylene torch and then machined to the proper contour. When reassembled, arc shields are fastened to the front sides of the castings underneath the contact segments in order to protect them from the arc.

The star wheels on some of the drums have been found to be loose. When this condition exists new pins are inserted and the holes are filled in and redrilled to provide a tight fit. Some star wheels which have rough edges from wear and from pitting due to flashing are ground off.

Old contact segments that are not too thin are cut down to make shorter length segments. Some ingenious jigs and fixtures are used in connection with the cutting and redrilling operations. Accompanying illustrations show the jigs as used at the Utica Park shops, which are typical of those used at each of the shops.

The fixture for holding a contact segment while it is being cut consists of a circular center section of the same diameter as the inside of the segment. The upper outside edge of this central portion has a scale of degrees. A sample segment of the type desired is placed around the fixture and the number of degrees spanned by it is read on the scale. This is used as a guide for the segments to be cut off. The old segment to be cut is then clamped in position so that it will cover the required arc. The clamp swings from the central shaft as a fulcrum. A loose piece on the outside is normally held away from the center portion by springs, but when the segment is in place it is tightened

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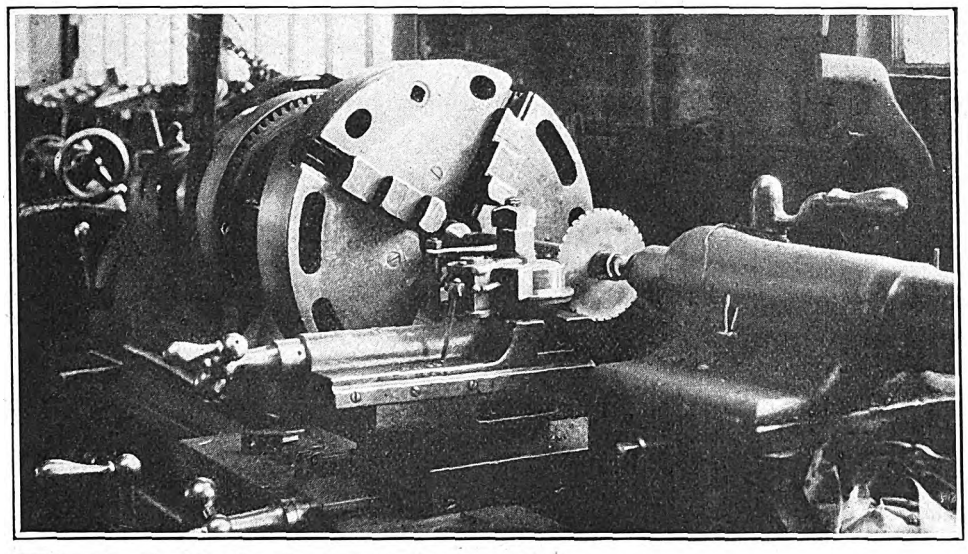
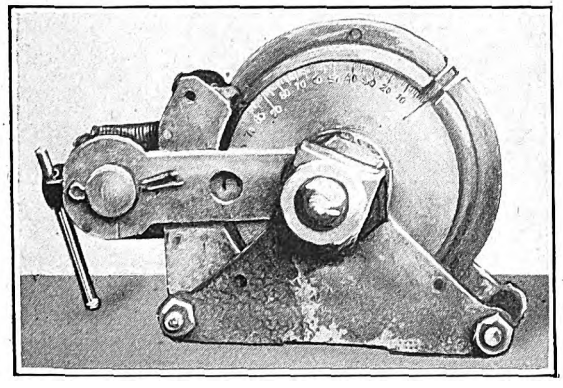
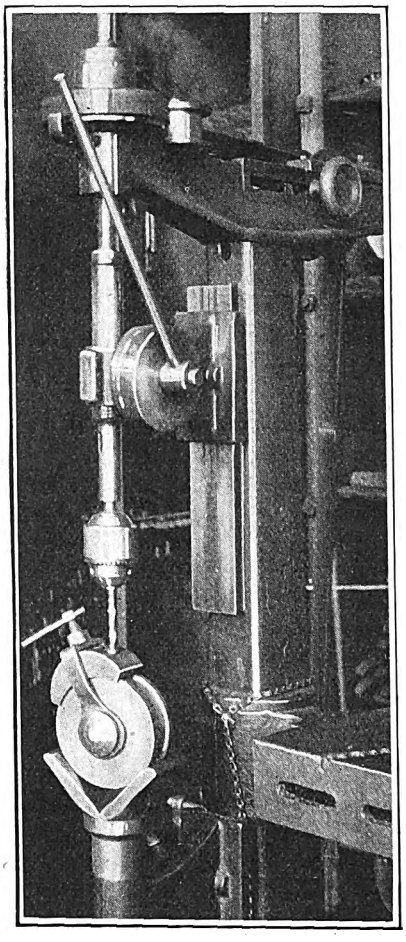
with a hand screw so that it fits over the segment and the hand screw holds it firmly in position.

The cutting is done in a lathe, the jig being fastened to the carriage as shown in one of the illustrations. The central arbor of the jig fits into the tool-post slide and is clamped by two nuts on top. A circular saw mounted on an arbor between the lathe centers cuts off the segment to exact length. As the circular part of the fixture with the segment clamped in position is free to rotate about its central shaft, segments can be placed in position rapidly and can be cut to desired lengths without changing the position of the jig on the carriage. In cutting, the segment is fed to the saw by the cross feed of the lathe carriage.







Special Jigs for Cutting and Drilling Contact Segments

Above, Set Up for Cutting Contact Segments.

At Left, Fixture Used to Clamp Segments While They Are Cut.

At Right, Jig for Drilling Controller Contact Segments.

The jig for drilling segments is quite similar to the cutting off fixture, but is arranged for mounting on a drill press. Its cylindrical body has the same outside diameter as the inside of the segments. Two sides are flanged so that the segment to be drilled fits into a groove. The segmental part of the jig with a bushed hole for guiding the drill is separate and fits over the contact segment. A clamping attachment operated with a hand screw pivots about the center of the jig.

To locate the segment for drilling the first hole a sample segment is used. The outside segmental part of the jig with its bushed hole is then put in place and is clamped in position by swinging the clamping arm over the loose part and tightening the hand screw. Radial drilling of the hole is obtained by the use of a V-block rest on the drill press. After the first hole is drilled, it is placed over a stud on the jig so that the second hole will be drilled accurately. The position of the loose part of the jig is fixed by two dowel pins which fit into corresponding holes. The countersinking operation is performed with the same jig, a special countersink being used which bottoms on the jig when the required depth has been reached.

After the contact segments are assembled on the controller drums, vertical position, alignment and rotundity are checked in a special fixture. Its two end brackets have adjustable centers so that the controller drum can be rotated. A straight edge is clamped in position on two brackets in such a position that by rotating the drum any eccentricity of the contacts is apparent at once. In this way the alignment of all the segments which are supposed to make or break electrical contact at the same time can be checked accurately. The vertical spacing of the contacts and the contact width is checked with templates of sheet steel which are placed over the drum at various positions. The same templates check the positions of the end insulation disks and the star wheel. The contact making and breaking positions and adjustment of the fingers to insure proper contact are checked after the drums and fingers are assembled in the controller frames.

The K-12 type of controller in its original form had a central blowout coil with pole piece extending over the contacts. The reverse cylinder occupied a space over the blowout coil with contact fingers on both sides. Controllers of this type are now being reconstructed by the railway so as to use finger blocks with individual blowout coils. The space previously taken by the blowout coil is utilized to provide a longer reverse cylinder with contact fingers on but one side. Eight controllers have already been changed to this form.

Many failures of controllers and other equipment are prevented on the Utica lines by an insulation resistance test made under the supervision of C. J. Jones, foreman

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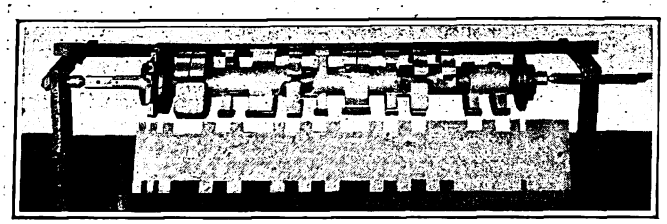


Fixture for Checking Controller Drums After Assembling

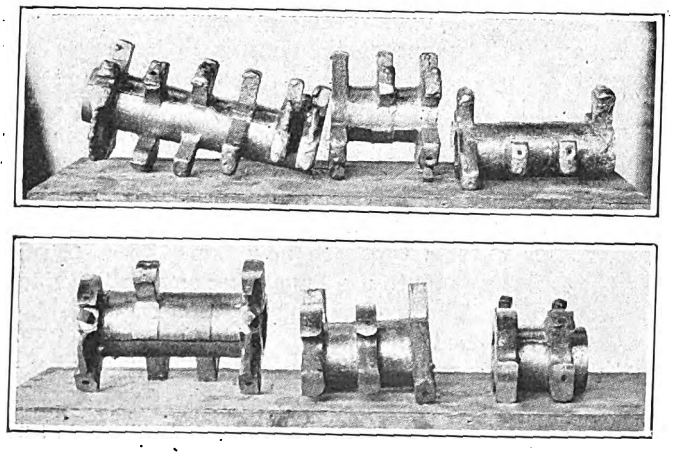
of the electrical department. This test is made with a voltmeter with a 550-volt scale and having an internal resistance of 65,800 ohms. The positive terminal of the voltmeter is connected to the trolley. A long flexible lead connected to the negative terminal is used to test the insulation resistance of the various electrical equipment and the wiring by touching this to the various controller fingers. The insulation resistance in ohms corresponding to any scale reading may be computed by the formula:

$$\text{Insulation resistance (ohms)} = \text{resistance of voltmeter (ohms)} \left(\frac{\text{line voltage}}{\text{meter reading}} - 1 \right)$$

with 550 volts on the line a reading of 10 volts on the particular meter used at Utica corresponds to an insulation resistance of approximately 3½ megohms. Experience at Utica has shown that any part which shows a resistance of less than 3½ megohms, which corresponds with a reading of more than 10 volts, should be repaired at once or trouble will result.

In making the test of the controller insulation the reverse drum must be centered so as not to make contact, all switches leading to grounded equipment must be turned off and the permanent ground to the motors must be removed. By touching the R-7 resistance finger, the insulation resistance of the wiring and grid resistors is measured. Armatures and fields of the motors are tested by touching the corresponding fingers in the controller.

Controller trouble is easily located by this test. Where composition finger boards are used, carbonization or dirt between bases frequently causes considerable leakage of current. It is difficult to discover such points by visual inspection, but by applying the insulation resistance test the weak points are quickly located. Where armature contacts show a. leakage the motor brushes are removed and each armature lead and the armature itself is tested separately to locate the weak spot. If the leak is in the field contacts the fields are separated and tested individually.



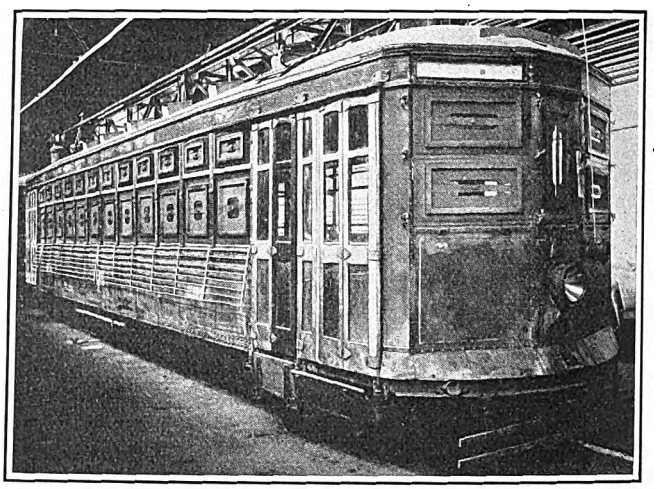
At Top, Controller Drum Body Castings Built Up by Brazing. At Bottom, Finished Body Castings After Welding

Improved Window Guard for Spray Painting

Rubber Vacuum Cups Pressed to Window Glass Securely Hold the Guard in Place While Car Is Being Spray Painted

By J. H. Lucas
Superintendent of Equipment the Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

ONE of the problems encountered in spray painting cars when the sash are not removed during the process of painting is that of devising a satisfactory method of protecting the glass from the paint. Since early in 1921, when the spray method was adopted for painting and varnishing cars at the Cold Spring shop of the Milwaukee Electric Railway & Light Company, various types of guards have been tried out to protect the car windows and other surfaces that were not be coated. One of the first methods tried out to protect



Vacuum Cups Hold the Guards in Place Over the Windows While Cars Are Spray Painted

the window glass from the paint used on the exterior of the car was to use cardboard guards tacked over the windows. This procedure was slow, the cards bent readily and pieces broke off in the corners. After about two months trial this method was discontinued in favor of covering the glass with a special paste of calcium chloride and flour. The paste was intended to prevent the paint from adhering to the glass. With this plan it was found that in summer the windows could be readily cleaned by scraping and washing, but in cold weather the paste solidified and made the cleaning of windows after spray painting rather difficult and expensive.

The next method tried was to paste paper on the windows before painting. This was tried on a number of cars, but the method was found slow and expensive. Considerable labor was involved in cutting the paper to size, pasting it on the glass and then scraping off the paper and cleaning the windows. A wooden guard was next developed that could be clamped in place in front of the sash and readily removed after painting. This type of guard was used for over a year. It was described in an article on the spray painting practice in Milwaukee, published in ELECTRIC RAILWAY JOURNAL for July 7, 1923, page 3. The wood guards were quite satisfactory when new, but in time they warped out

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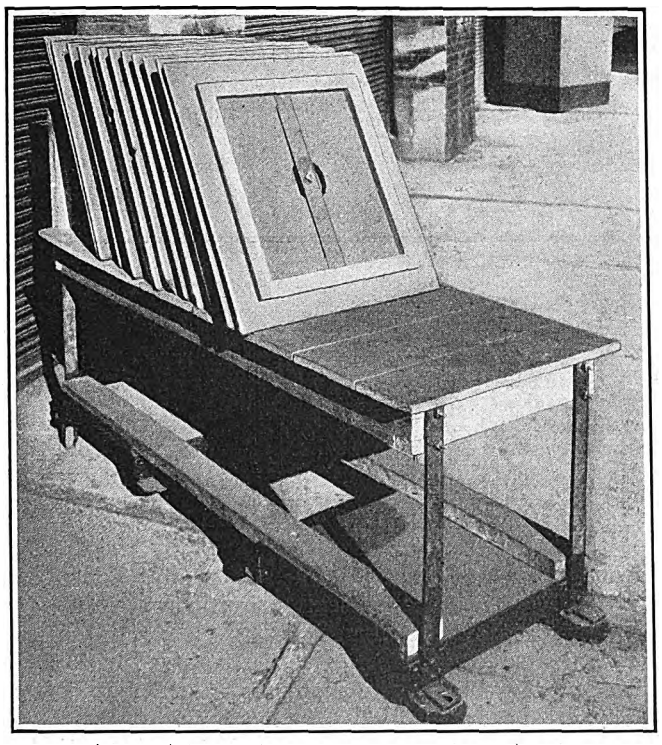
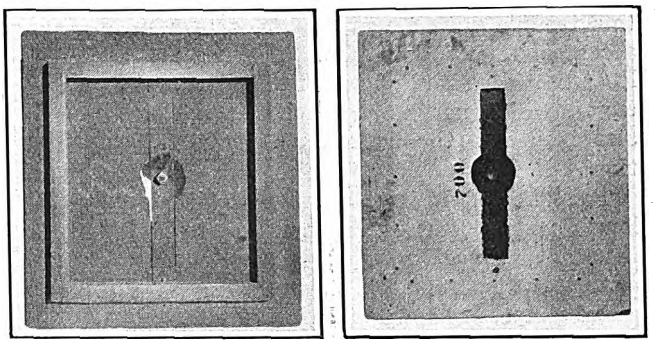


Guards Are Transported About the Shop on a Small Hand Truck



New Type Window Shield

At left, guards of press board or Agasote are reinforced with a light wood frame to prevent warping.

At right, view of the inner side of the guard. The small rubber vacuum cup that holds it in place against the glass and the metal strip to which the cup is attached are shown.

of shape and paint adhering to the sliding members made it increasingly difficult to clamp them in place. In addition, when these guards had been used several times for applying a coat of color or paint the edges became heavily coated with the color material and they would mar the finish when used with a varnish coat. This required expensive touching up after varnishing.

In experimenting with methods of improving these guards attention was called to the type of small rubber vacuum cup which when pressed against glass or any other smooth surface adheres tenaciously. It was found that this device would work satisfactorily for holding guards over the windows while spraying painting, and a new type of guard was developed. This is shown in accompanying illustrations. The new guards are made of press board or Agasote in various sizes to fit the different sash. The small rubber vacuum cup is fastened to a metal cross-piece. Wood stiffeners are placed on the back of the press board, as illustrated.

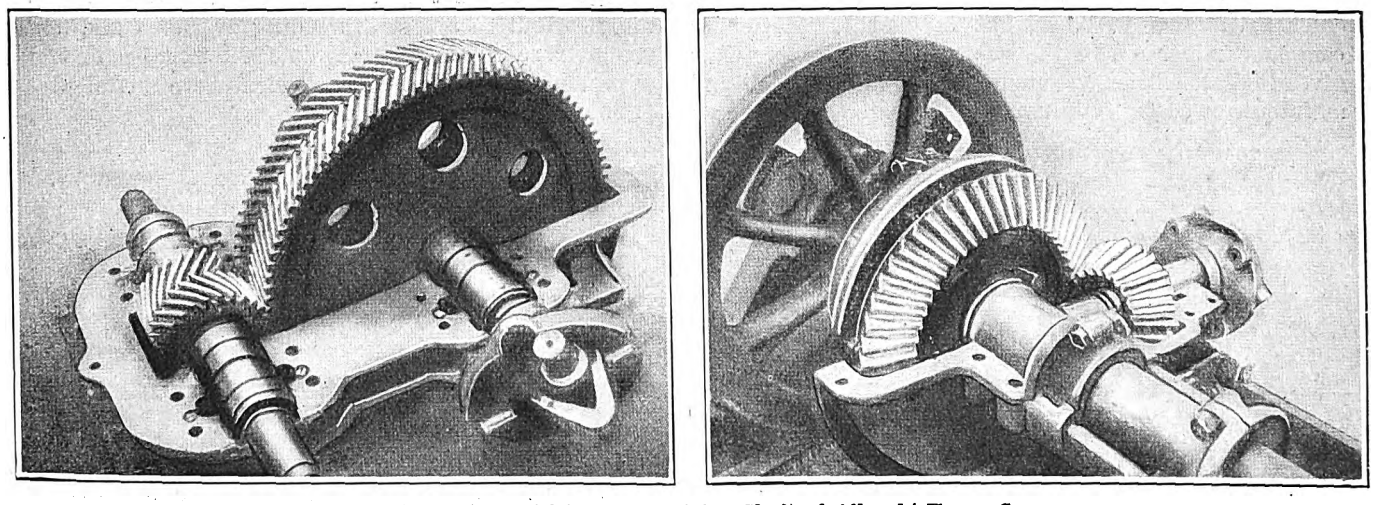
These guards are less expensive to make than the previous wooden clamp type. They can also be more quickly put in place and removed than the earlier type and they overcome most of the undesirable features previously encountered. The labor for setting and removing the guards has been reduced one hour, while the touch-up and cleaning labor after spray painting has been decreased approximately 2½ to three hours per car. A small truck or cart, illustrated, has been constructed for conveniently transporting a complete car set of guards from the storage rack to the car to be painted.

Lubricating Motor Gears

German Operators Favor Cast-Steel or Pressed Gear Cases—Complete Immersion of Gears in Oil Is Considered to Give Highest Efficiency

TOO much attention cannot be paid to producing an absolutely dustproof, waterproof and oilproof gear case. The existing forms are far from fulfilling the basic requirements. Only cast steel or pressed steel casings have given satisfaction, according to an article by Chief Engineer Willenberg of the Wiesbaden Street Railway published in *Verkehrstechnik*. Their manufacture requires expensive patterns or dies. Designs with rivets, welds or their combination have failed because they cannot withstand the rough service. Every time such a casing hits a high paving stone or other obstacle, it becomes dented and rips open. The chief reasons for these failures are the use of too thin steel and welding at the wrong place, usually at the edges.

The Siemens-Schuckert Company has tried to obviate



Gearing Between Motors and Driving Shaft of Albrecht-Krupp Car

At left, gearing between motor and transmission shaft; at right, bevel gearing to wheel axle

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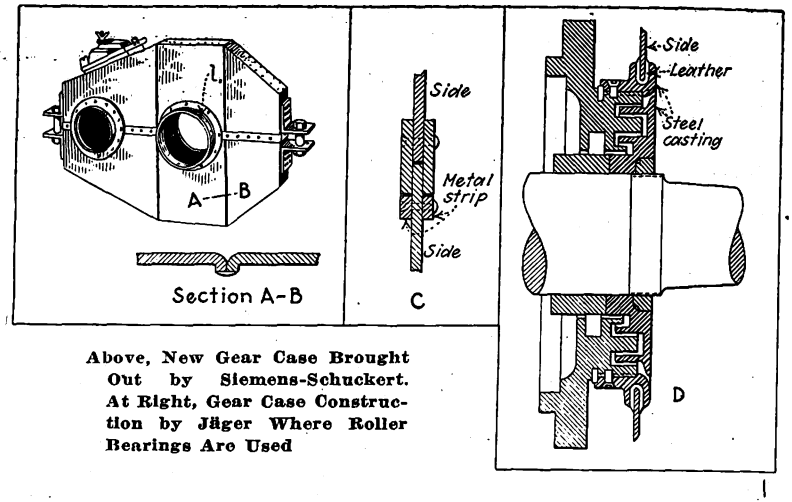
this trouble with a new design, shown in an accompanying illustration. The seams are located at the sides, and are made on bent-over edges, which not only give better welds but also reinforce the casing, as shown in section *A-B*.

To make a tight joint between the upper and lower parts a long overlap with a felt gasket is used. Such a joint is sealed more effectively against water splashed against it by adding metal strips, as shown at *D* in the illustration. Repairs are expensive in case of damage, but certain sacrifices have to be made to perfect a tight case.



Above, New Gear Case Brought Out by Siemens-Schuckert. At Right, Gear Case Construction by Jäger Where Roller Bearings Are Used

The opening for the axle requires difficult construction, and very little has been done so far to remedy this. With the wheel gage of 1 m. (39 in.) commonly used in Europe little space is available for a well-designed stuffing box. The best construction used so far consists of a disk of leather which stands on edge against the axle and grips it tightly. The Siemens-Schuckert design uses a wide leather collar indicated as *l* in the illustration. This reaches over the shoulder of the axle bearing. It is pressed tightly around the shaft by a clamp to prevent the entrance of water and dirt. This construction, however, does not prevent the oil or grease from a leaky casing getting out.

Where the armature shaft passes through the sheet steel casing, an edgewise leather disk or a narrow leather collar has been used, as on the outer axle hole. It is found frequently that the wall of a cast-iron case rests directly against a groove in the shaft, with nothing in between. But this hole, like the leather disk, is quickly hammered out due to its short distance from the casing support. This construction is ineffective because it is not only essential to keep road dust out of the casing and away from the armature bearing, but also to prevent the gear case lubricant from being drawn into the armature bearing. There is usually a negative air pressure in a motor, so that a barrier must be provided between the casing and the bearing.

The firm of Jäger in Elberfeld, in co-operation with the railway system of Berg, has brought out a gear case design, as shown, for motors with roller bearings. A deep groove fitted with leather gives an effective protection toward the outside, while a throw-ring returns dripping oil back into the gear case, keeping it away from the bearing.

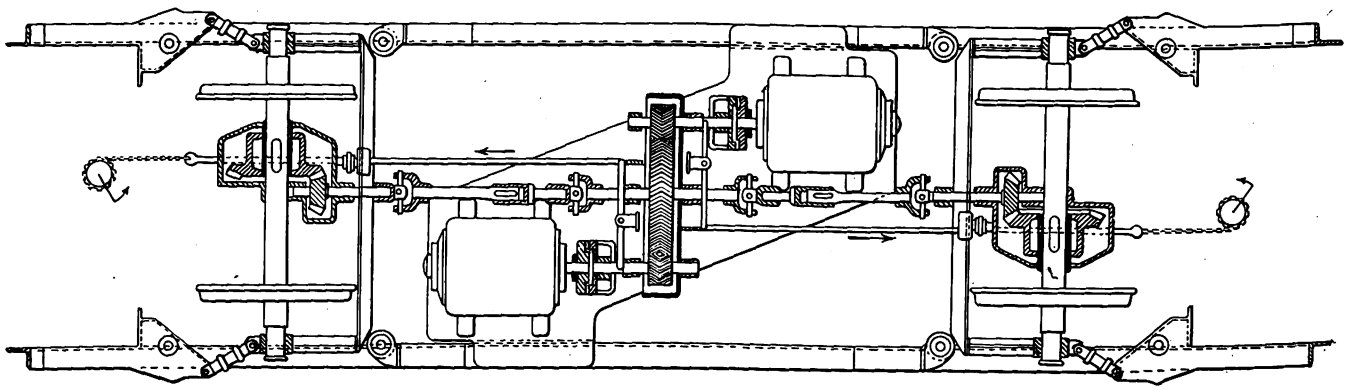
The real goal to be sought in gear lubrication is complete immersion of the gears in an oil bath. This gives highest efficiency, smallest wear, and least oil and maintenance cost. Only two trolley systems are known to the author which actually use such an oil bath. One of them is the worm drive car built by the Oerlikon company in 1905 for Zürich, about which no details are available. The other case is the Albrecht-Krupp car. Both of these car constructions are materially different from the customary design with suspended motors. In both of these cases the motor is fastened to the car body, with its axis parallel to the rails.

The new Albrecht-Krupp car differs from that of Dortmund only in that each motor has its own pinion. The first completely inclosed gear operates in an oil bath in a heavy cast-iron gear casing. Both pinion and spur gear have double side bearings and are equipped with angle-teeth with such an angle of inclination that the same number of teeth are always in mesh. Connections to the axles are by bevel gearing, also operating in an oil bath. The pinion is in one piece with the shaft, and has double bearings. The halved large bevel is spring-connected to the car shaft.

The Albrecht-Krupp car has two gears in series whose over-all efficiency is equal to the product of the efficiencies of the individual gears. Endeavors are already under way to try to get along with only one set of gears per motor.

Tons of Copper in Boston Elevated System

STATISTICIANS of the Boston Elevated Railway have calculated that the total weight of copper in the transmission and distribution system of the company is 6,584 tons. Of this, 511 tons are in trolley wire, 708 tons in transmission cables and 5,365 tons in the distribution system, including overhead and underground feeders and return. In 1923, 82 miles of trolley wire and 91 miles of span wire were installed and 41,900 trolley cars were used.



Driving Mechanism of Albrecht-Krupp Car—Each Motor Has Its Own Pinion Bevel Gearing Drive to Axles

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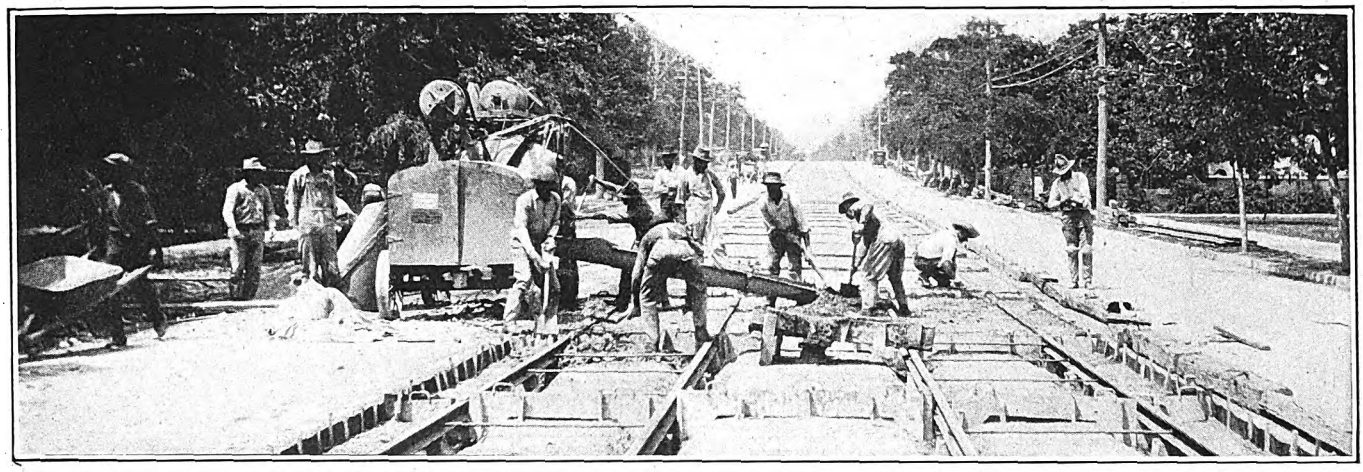

Monolithic Concrete Track Construction in Hot Springs with Expansion Joints Every 15 Ft. Held in Place Temporarily by Means of Steel Templates

Tieless Track Laid in Hot Springs, Ark.

Federal Light & Traction Company Has Adopted a Standard Type of Track Construction Using Longitudinal Supports for the Rails and Monolithic Concrete for Subgrade and Paving—Maintenance Costs Have Been Reduced Materially

By G. J. Gauthier
Engineer Federal Light & Traction Company

CONFRONTED several years ago with the necessity of making additional capital expenditures for street paving and also with increased operating costs, the Federal Light & Traction Company of New York, which controls street railway systems in Hot Springs National Park, Ark.; Springfield, Mo.; Las Vegas, N. M.; Tucson, Ariz.; Aberdeen, Wash., and elsewhere, made a careful study of track and paving design. As a result, it has adopted as its standard track structure an unusual type of tieless concrete construction, which has greatly reduced maintenance cost and provides a smooth and hard surfaced pavement.

In 1915 this company laid its first tieless track in Tucson, Ariz. The following summer the same type of construction was tried in Hot Springs National Park, Ark., the installation being made on a line where a seven-minute headway was operated. Experience there with this tieless structure during the ensuing eight years was so satisfactory that 12,500 sq.yd. of right-of-way was rebuilt in the same way in 1924. Under franchise agreements the railway is required to repave its own track area whenever the streets where it operates are repaved. An additional 2,300 ft. of double track right-of-way is now being reconstructed using this type of pavement.

The outstanding features of this design are the elimination of ties and the use of concrete as the material for both subgrade and surface paving. It has been found by the railway that when the proper aggregate is used and concrete is carefully placed, it makes an extremely durable pavement. Even where municipal regulations preclude the use of concrete paving for the entire street area, the company has secured permission to use it in the track area.

During the reconstruction of the track in Hot Springs last year traffic was maintained by means of emergency buses. It was possible to a certain extent to keep other vehicular traffic off the street during the construction period. After the concrete for the pavement had been poured the right-of-way was protected from all vehicular traffic during a period of 28 days by means of old ties placed end to end just outside the track area.

Old track was jacked up and torn out. Ties and rails were removed from the right-of-way before any work was done to prepare the subgrade. Excavation for the subgrade was made to the full width of the right-of-way. In depth, an allowance was made for the compression resulting from rolling. To compact the sub-base a 10-ton steam roller was used. After the subgrade had been evened up longitudinal ditches were cut to accommodate concrete supporting girders for the rails.

Standard construction of the Hot Springs Railway includes 60-lb. A.S.C.E. T-rail. In most cases, if the old rail does not show signs of serious wear it is relaid again after it has been thoroughly cleaned of dirt and rust. While continuous joints were installed in the track laid in 1916, "Apex" welded joints were used entirely in the work done in 1924.

On straight track and on curves having a radius of 2,000 ft. or more, tie rods of ¾-in. diameter were spaced 5 ft. apart. They were spaced 3 ft. apart on curves having a radius less than 2,000 ft. and more than 300 ft. Spacing was 2 ft. 6 in. on curves with a radius of less than 300 ft.

During the assembling of the new track the rails were supported on concrete or brick piers placed about 5 ft. apart. The track was finally brought up to exact grade by means of hardwood wedges driven between the tops of the piers and the base of the rail. A final

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lining of the track was done with a transit, and temporary braces were placed every 10 ft. to hold the line during the pouring of the concrete. All of this work was done by the construction forces of the Hot Springs Street Railway under the supervision of an engineer from the New York office of the Federal Light & Traction Company. Under favorable conditions as much as 500 sq.yd. of pavement was laid in the course of a single day.

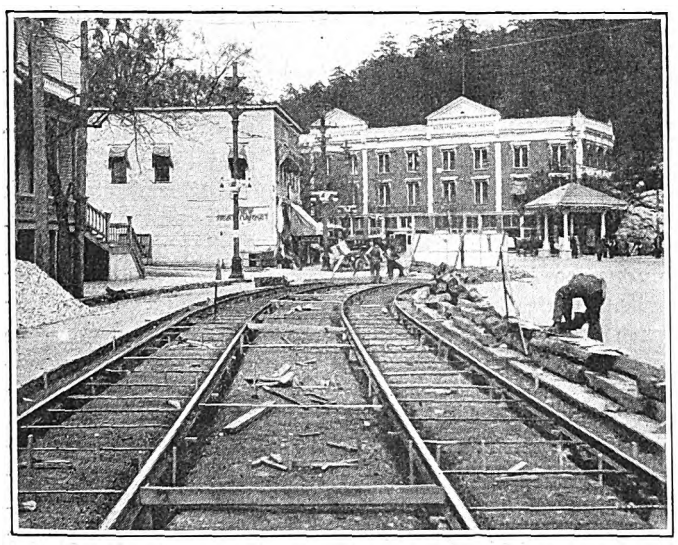
For the sub-base a concrete mixture of 1-2½-4 was used, while the surface topping was a 1-2-2 mixture. For the aggregate clean sharp river sand was used, together with crushed stone of size not larger than would pass through a 2-in. ring for the base or through a 1-in. ring for the surface. Materials for the aggregate were dumped along the side of the street before the work commenced. Cement was delivered by small trucks in close proximity to the mixer.

A Jaeger gasoline-driven concrete mixer equipped with loading scoop and center swinging chute was mounted on a truck. The use of the swinging chute permitted the complete pouring of a section of track between expansion joints at one setting. The base was poured first and then the mixture changed for the top surface. A mixture sufficiently wet to puddle easily without the use of tampers was used. The top surface was poured almost immediately after the pouring of the base. Immediately after the top had been brought to a rough surface crowning of the track to form a flangeway was done by running a template over it. This template conformed to the cross-section of the finished surface and was worked back and forth across the mass until the concrete was brought to a true surface.

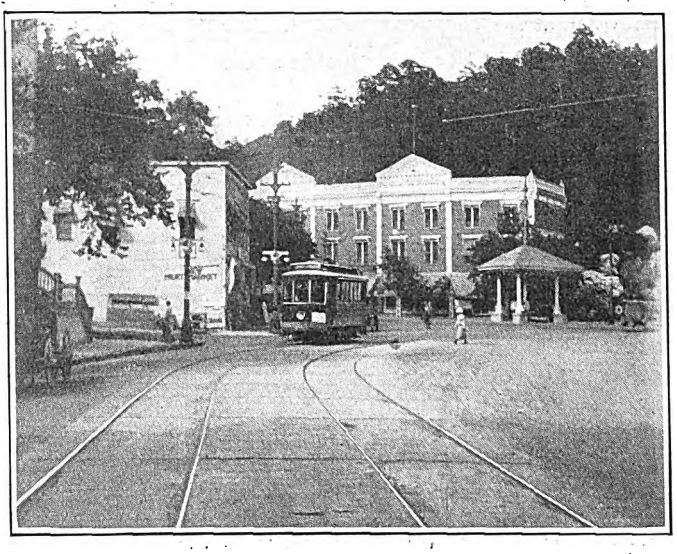
Lateral expansion joints were provided in the concrete structure every 15 ft. and extended entirely across the right-of-way. They were made locally and consisted of a filler of ½ in. of asphalt between two sheets of thin felt paper. The filler was cut to conform to the cross-section of the work and placed against a steel template made in pieces to facilitate removal, the asphalt filler projecting about 1 in. above the surface of the finished concrete. After the concrete had been placed the steel plate was removed and used again leaving the filler in place.

The surface of the concrete was then finished with a wooden float. No shaping or floating was done after the concrete had taken its initial setting. Within twelve hours after the concrete was placed the top was swept lightly with a stiff broom to roughen the surface slightly, and it was then covered with a 2-in. layer of sand. This was kept moist for three days. The freshly concreted track area was kept closed to all traffic, both railway and vehicular, until the concrete had hardened.

Aside from a few temperature cracks which developed in the concrete surface and which were filled in with hot asphaltum, the concrete track pavement laid in Hot Springs National Park in 1916 does not show any appreciable wear. No low joints have been found after more than eight years of service, and the only maintenance which has taken place has been to refill the expansion joints once or twice a year with hot asphaltum. Thus paving repair and replacement has been practically eliminated, and no track maintenance has been required. This is probably accounted for by the solidity of this type of concrete construction used, the design allowing no wave motion of the rail after it has been concreted in, while the rail is also protected against any lateral movement. Moreover, there is ample strength in the concrete to support both rail and vehicular traffic.



Track Reassembled, Surfaced, Lined and Blocked Up Ready for Concreting



Finished Appearence of Concrete Track Structure of the Tieless Type Used in Hot Springs, Ark.

The cost of this type of construction has varied somewhat with the town in which the work was done. For the work done in Hot Springs, Ark., in 1924, cement cost $3.13 net per barrel delivered on job, sand $2.35 and crushed rock $3.60 per cubic yard delivered, common labor $3 per day of nine hours. On a piece

COST PER LINEAL FOOT OF DOUBLE-TRACK RIGHT-OF-WAY

Excavation and earth removal, including rolling and tamping	$0.598
Track labor, including removal of old track, cleaning of rails, drilling and installing tie rods, welded joints labor, reassembling of track, lining and surfacing, including also watchman and timekeeper	1.339
Track materials, including new rail needed for replacement, special work, welded joints and welding materials, all bolts, tie rods and roadway tools	1.712
Concrete labor, mixing, placing, finishing	.572
Concrete materials, all cement, sand, crushed stone, expansion joints, including proportional cost of concrete mixer	4.257
Grand total labor and materials	$8.478

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of double-track right-of-way 17 ft. 9 in. wide, 3,529 ft. long, including the installation of a crossover, expenses were as given in the table on page 617.

As there are 1.97 sq.yd. of pavement per lineal foot of track, the entire cost of preparing the track as well as the cost of pavement was approximately $4.30 per square yard.

Use of Undersize and Oversize Armature and Axle Bearings

Variation of the Distance Between Armature Shafts and Truck Axles Causes Many Motor Troubles—Close Fitting Bearings Are Essential to Accurate Alignment

BY P. A. PONTIUS
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

IT IS very important to maintain the gear center distance on railway motors closely and essential to pay particular attention to armature and axle bearings. Both are subject to wear inside and outside, thus affecting the gear center distance.

When a motor is put in service the armature shaft will wear down and the original bore of the armature bearing will increase, losing the close fit between shaft and bearing bore. Thus the armature gear center distance will be lost. By using undersize bearings (i.e., bearings with smaller bores than on new motors) the original condition of a new motor can be regained. To meet this condition some railways have made up standard undersizes of bearings for each type of motor. Five different bores for each bearing have been developed by one manufacturer, the diameters varying by increments of 1/32 in.

On each of these five different sizes the babbitt lining is kept 1/16 in. thick as on bearings of new motors. This is done in order to prevent the armature from touching the pole tips in case the babbitt lining should melt due to overheated bearings.

When a worn armature bearing has to be replaced, the diameter of the shaft-bearing surface should be calipered. If worn undersize it should be machined smaller to the nearest size of bearing bore mentioned above. The maximum amount that the shaft is reduced by wear and turning should be limited to 1/8 in. less than standard. If the shaft journal is reduced more than 1/8 in. smaller than standard, the shaft may be weakened to such an extent that it should be replaced.

Oversize Outside Diameter—In the foregoing it is assumed that the outside diameter of the bearing is standard and has a good tight fit in the housing or motor frame, according to the design of the motor. When bearings become loose in their seats (in housing or motor frame) it is necessary to provide an accurate fit again. This may be done by reboring the bearing seat and using oversize bearing shells or by building up the seat through welding and reboring to standard size. Where oversized bearings are used they should have an outside diameter 1/8 in. larger than standard and with the five different bores mentioned.

If the housing bore can be welded satisfactorily so as to avoid distortion or misalignment of the housing fit in the frame, the oversize bearing can be eliminated by reboring the housing to standard size. The use of shims to hold worn bearings tight in the worn housing or motor frame is not good practice. The wear at the bearing seat is not the same at all points of the surface fit and, therefore, the use of shims will shift the center of the bore, since the bearings will collapse more at the high points of contact. As a result the gear center distance and the air gap will be different from those for which they were originally designed. Excessive collapsing of the bearing shell may also lead to hot bearings if the bearing is not bored or broached after it is pressed into the housing. When the strength of the casting will permit, the worn seat should be rebored to a diameter 1/8 in. larger than standard.

If the outside diameters of bearings are increased in steps of 1/32 in. in the same way that the diameter of the bore is decreased, 25 different sizes of bearings for every shaft journal would be needed. If the outside diameter is limited to two sizes (standard and 1/8 in. oversize), five different bores in steps of 1/32 in. will require a total of ten different sizes. This should be the extreme limit of variation. With these ten sizes, and renewal of the shaft and housing after the 1/8 in. undersize journal fit and the rebored housing are worn out, it is possible to keep close gear center distance.

A further reduction from ten to six sizes of bearings for every shaft journal can be obtained, if increments of diameter of 1/16 in. instead of 1/32 in. are used for the undersize bearings. This would lead to the following preferred sizes: (1) Standard outside diameter with standard bore, (2) standard outside diameter with 1/16 in. undersize bore, (3) standard outside diameter with 1/8 in. undersize bore, (4) 1/8 in. oversize outside diameter with standard bore, (5) 1/8 in. oversize outside diameter with 1/16 in. undersize bore, and (6) 1/8 in. oversize outside diameter with 1/8 in. undersize bore. The above preferred line of undersize bearings has already been accepted by some operators.

The production of undersize bearings by increasing the thickness of babbitt lining to 1/8 in. and reboring the babbit lining to fit the worn shaft has two disadvantages. The safety feature which is obtained by use of a 1/16 in. lining, so that the armature does not touch the poles in case of hot bearing trouble, is lost. Furthermore, the Brinell test of babbitt shows that the highest Brinell figure is obtained at the surface of a poured test piece. Therefore, it is good practice to mold the babbitted bearings as closely as possible to the finished size in order to increase the life of the babbitt lining.

To standardize on the two different outside diameters only has the advantage that the best wearing surface is obtained on the outside of the bearing as the castings are produced from either standard outside or 1/8 in. oversize patterns. The closer the bearing shells are finished to these two sizes, the more they will stand outside wear, as the Brinell test on castings shows that the highest Brinell figure is obtained close to the surface of the casting.

AXLE BEARINGS SHOULD NOT BE NEGLECTED

As the speed of rotation in the axle bearing is very much lower than the speed in armature bearings, the wear is correspondingly less. This leads to the neglect of axle bearings. They are, however, just as important in regard to the gear center distance as armature bearings and operators should take the same precautions with them as with armature bearings. If different sizes are decided upon, no smaller steps than 1/16 in. difference in diameter of bore and outside diameter should be selected.

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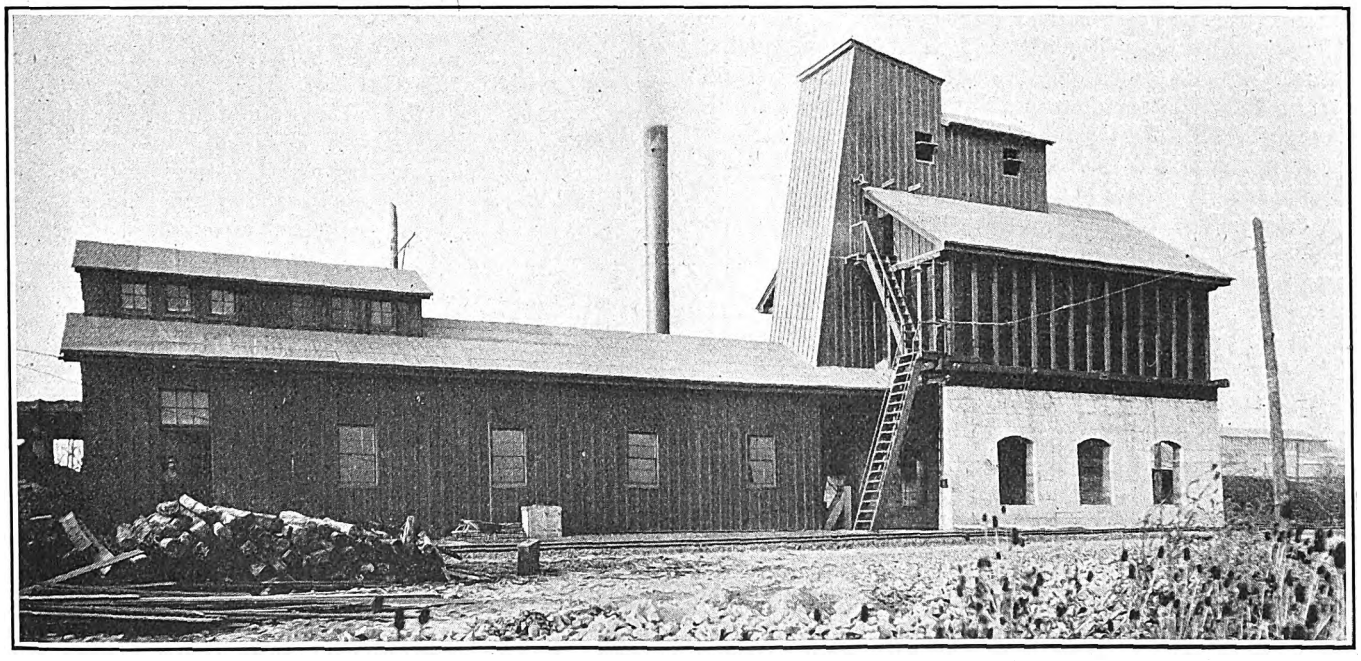
Modern Drying Plant Cuts Sand Cost in Half

Direct Heat Rotary Drier of the United Railways & Electric Company Is Operated by Three Men Working Nine Hours a Day Instead of Twelve Men Working Twelve and 24 Hours

AN IMPORTANT reduction in the cost of obtaining dry sand has been secured by the United Railways & Electric Company of Baltimore through the operation of a modern drying plant. This company operates some 1,500 cars in Baltimore and surrounding towns. Formerly it required a force of twelve men working in shifts 24 hours a day to maintain an adequate supply of sand when stoves were used for drying. The cost of drying sand and the manual labor of handling at that time was very high. Some years ago the railway decided to replace the old system by modern methods and built a plant which can be operated by three men. This plant is now operated only part of the time. The cost has been reduced to approximately half of what it formerly was.



Sand Is Dried in the House at the Left, from Which It Is Carried by a Bucket Elevator to the Storage Bin at the Right. From There It Is Dropped Directly into the Work Cars of the Railway

The new plant was designed by and built under the direction of the engineering department of the company. Wet sand is delivered by cars on an elevated trestle 228 ft. long and 12 ft. above the storage floor. This trestle is designed to carry either steam railroad or electric railway cars and to permit both center and side dumping.

From the storage pile below the trestle the sand is shoveled by hand into the pit of an elevator. The latter raises it and drops it into a chute opening directly into a rotary drier. After passing through the drier the sand falls into another pit, from which it is raised by a bucket elevator into the storage bin. Here the sand is separated from the gravel, which passes into a separate bin.

The drier itself is a revolving steel cylinder in which wet sand is agitated until the moisture has evaporated. Heat is generated under forced draft and the hot furnace gases pass through the revolving cylinder. Inside are a number of steel angle shelves which lift the sand and drop it as the cylinder revolves. Two heavy steel tires encircling the cylinder rest on cast-iron rollers. Rotation is imparted by a spur gear meshing with a gear ring which encircles the cylinder of the drier.

The furnace has a grate surface of 25 sq.ft. Using old wood ties for fuel, the drier has a capacity of approximately 5.5 cu.yd. of sand per hour. Its capacity is about 8 cu.yd. per hour using bituminous coal for fuel. This increase, however, is more than offset by the greater cost of coal. The railway therefore has adopted the practice of using its discarded ties for this purpose, as they are available in large quantities at practically no cost. Some disposition of old ties must be made in any case, as they cannot be allowed to remain alongside the rebuilt track, and to transport them to the sand drier is as easy as to get rid of them in other ways.

Heavy timber construction is used for the drier house, which is 22 ft. wide by 16 ft. long and 13 ft. high at the eaves. The storage bin for dry sand is supported on three reinforced-concrete walls. Below it are chutes to deliver the sand directly into cars. A tower between the drier and the storage bin houses the elevator and its mechanism.

Wood ties are cut to suitable lengths for use in the furnace by a circular saw operated by an independent electric motor. This is housed in a shed 20 ft. long, 12 ft. wide and 9 ft. high located at the rear of the drier house. Old ties are delivered directly to the saw shed by cars operated on a track running alongside the structure. A pile of such ties waiting to be cut up is shown at the left in the accompanying illustration of the drying plant.

At the end of the storage bin for drying sand is a gravel bin of 30 cu.yd. capacity. The gravel procured by the operation of this plant is a by-product that serves to increase the economy of operation. Formerly it was necessary for the company to buy gravel of this kind to be mixed with tar in making mastic pavement filler. More than enough for this purpose, however, is now secured as a byproduct of the sand drying plant.

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Underground Storage for Oils and Paints

Eighth Avenue Railroad, New York City, Has Provided a Solid Concrete, Fireproof Oil Storage House with Tanks and Self-Measuring Pumps Installed Below Grade

A SATISFACTORY storehouse for oils and paints located conveniently to the shop and also to the supply track has been provided by the Eighth Avenue Railroad, New York, in an interesting manner. The side of the shop on which the supply and storage tracks are located has windows extending down to within 4 ft. of the ground. As these were essential for efficient lighting of the shop, it was desirable in constructing any new building not to interfere with the entrance of daylight. This difficulty was overcome by making the principal part of the new oil storage house below grade, with the part above the ground level only sufficient to permit the containers to be rolled through an opening in the end of the structure when filling the underground tanks. This method of handling provided for filling at a single level, so that hoisting equipment for handling the barrels was unnecessary.

The storage house for oils and paints is constructed entirely of reinforced concrete. It is 30 ft. long and 9 ft. 6 in. wide inside and is provided with a headroom of 8 ft. The concreted walls are 12 in. thick below grade and 8 in. thick above. A stairway built of concrete is provided at one end, so that supplies can be obtained by the men for maintenance purposes as drawn off through self-measuring pumps. Two sheet-steel doors at the opposite end of the oil house above the ground level provide an opening for rolling in the containers as they are delivered.

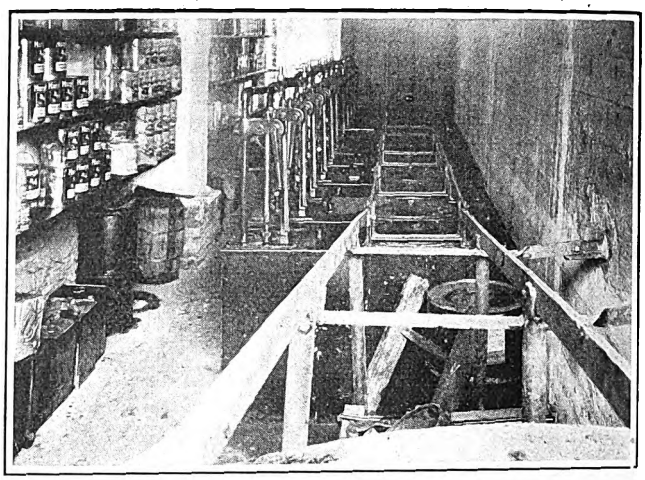
Arranged along one side of the oil house are eleven Gilbert & Barker tanks with self-measuring pumps. These provide storage for car oil, black oil, compressor

Rolling a Barrel of Car Oil into Position for Filling the Tanks in Underground Oil Storage

oil, auto oil, switch oil, kerosene, asphalt paint, insulating paint, linseed oil, turpentine and alcohol.

From the opening where the containers are rolled into the oil house a steel framework is sloped down to a level just above the tops of the tanks, forming a runway on which the containers can be rolled into position and stopped at any point over the manhole of the proper tank so that the contents run into the tank without difficulty. Thus no hoisting equipment is needed. This is accomplished with a minimum of labor and time, and there is no danger of damage to containers or waste of lubricants.

The floor of the oil house is of concrete with drains to insure dryness. Ventilation is provided by two rotary ball-bearing ventilators installed on the roof.



Interior of Storage House for Oil and Paint

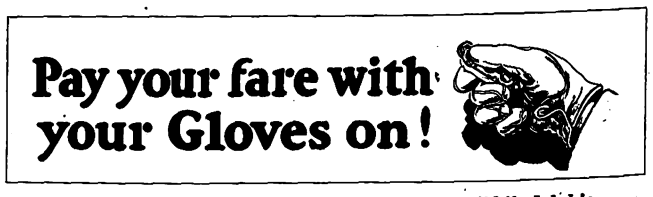
Storage of paints in cans is taken care of by three shelves extending the entire length of the house on the opposite side from the oil storage tank. The larger containers and those having semi-solid lubricants are stored on the floor underneath the lower shelves.

The oil storage is heated by steam pipes hung from the ceiling and light is furnished by four 50-watt lamps controlled from a switch at the stairway.

Magazine Token Holders in Philadelphia

LAST September the Philadelphia Rapid Transit Company raised its fare to 8 cents cash, with two tokens for 15 cents. At the same time the company decided to provide a holder for the tokens to popularize their use and lessen the time consumed on the car in change-making and fare collection. It was believed that this would help the cars, particularly the one-man cars, to maintain their schedule speed.

The holders, or "carfare carriers" as they are called in Philadelphia, have a capacity of 12 tokens each. The payment of $1 by a passenger to the conductor or



Car Card Advertising the Token Holder in Philadelphia

car operator entitles the passenger to a carrier with 12 tokens and also a ride. On the basis of 7½ cents for a ride, this charge is equivalent to the sale of a holder for 2½ cents. The cost of the holders is about 4 cents each to the company, but the difference between cost and selling price, 1½ cents, is absorbed by the company.

As the holder is practically indestructible, it is realized that sales of holders will eventually fall off and regular passengers will need tokens, and to cover this situation the company has established a rate of $3 for 40 tokens. This is called a "family package" and is

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expected to be popular with the heads of families and others who wish to purchase a considerable number of tokens at one time. From these packages customers will fill their existing token holders.

The Philadelphia Rapid Transit Company has popularized the use of the holders through references to them in "Service Talks," car cards, etc. An accompanying illustration is a reproduction of a car card advertising the holder. It points out that the passenger can pay his fare without removing his gloves. Up to date about 515,000 of these token holders have been sold in Philadelphia and they are being sold at the rate of about 15,000 a week. The holders, which are of steel, are made by the J. E. Mergott Company, Newark.

British Steam Railroads Carry Much Local Traffic in Cities

Comparison of Electric Railway Track Mileage in Six British and Six American Cities Is Likely to Be Misleading

BY WALTER JACKSON
Bus and Fare Consultant, Mount Vernon, N. Y.

AMONG the data in the report of the A.E.R.A. committee on foreign operation, published in ELECTRIC RAILWAY JOURNAL for Sept. 20, 1924, was a table comparing street railway track mileage, population, traffic, etc., in six British and six American cities. This mode of comparison has been used these last twenty years and suffers from the fact that it does not show the exceptionally important part played by the short-haul steam trains in most large British cities. The part played by the motor bus in urban transportation is another and later factor that deserves consideration.

In Edinburgh, for example, with a population of 420,000 the table shows 1.78 single track-miles per 10,000 inhabitants. A total of 71.8 single track-miles

	Miles from City Station	Daily Trains Both Directions		Miles from City Station	Daily Trains Both Directions
Edinburgh District			Birmingham District		
Portobello	3.0	123	Vauxhall	1.5	74
Turnhouse	6.5	38	Norton	5.5	82
Eskbank	8.0	53	Manchester District		
Glasgow District			Sale	2.5	120
Partick West	2.25	157	London Road	8.5	128
Partick Central	2.75	153	Sheffield District		
Rutherglen	3.5	153	Wincobank	3.5	50
Partick	4.25	186	Leeds District		
Newton	6.75	86	Bramley	3.75	58
Uddingston	8.50	77			

corresponds to 36.7 route-miles. But the Edinburgh transportation system also includes 35.25 miles (or more) of motor bus route. This service is of real importance, for in the fiscal year ended May 15, 1924, out of a total of 119,333,902 passengers 18,939,780, or about 16 per cent, were carried on the buses.

This omission is of less importance than that of the short-haul steam railroad service, as the same table apparently did not allow for bus operation in the fairly parallel case of Washington, with 438,000 population. Both cities have buses to supplement the street cars, but only Edinburgh has steam service that is a big factor in the local transportation situation.

While no record is available of the number of passengers carried, the above figures taken from the official steam railroad time-table indicate that this business is far more extensive than in America except for a few cities like Pittsburgh, Boston and Chicago. In all cases 10 miles from the city station has been taken as a maximum.

Glasgow has the cheapest street railway fare in the world, but even so the tramway has powerful steam railroad competition. What the short-haul steam railroads are after in Glasgow and other cities are the long rush-hour trains which can be handled at low cost. Zone tickets are sold on the basis of twelve rides a week. In some cases there is no collection on the trains. They are operated with a minimum of personnel, the ticket being taken up as the passengers depart through the "closed" station.

From the figures in the foregoing table it can be judged that Glasgow has a very extensive system of steam rapid transit. Because the trains are long and the station spacing very short, the speed is not much more than 15 m.p.h. For example, there are eleven stops in the 7¾ miles between Maryhill and Rutherglen, eleven stops in the 10 miles between Clydebank and Springburn, nine stops in the 9¾ miles between Glasgow station and Hairmyres, and also nine stops in the 10½ miles between Glasgow and Bothwell. Unlike Edinburgh, Glasgow is only now beginning to use buses. Co-ordinated tram and bus service has long been operated in Birmingham, Manchester, Sheffield and Leeds.

From the foregoing notes it is plain that omission of the steam railroads and motor buses from tabulations of this sort impairs the accuracy of the comparison. It is scarcely justifiable to say that the rides per inhabitant per annum are 50 per cent greater in large American cities than in British cities of like size. Nobody really knows just what this percentage is because the British steam railroads do not keep an exact count of their commuter or "season" passengers.

The Readers' Forum

Calendar of Meetings Helpful

SOUTHWESTERN PUBLIC SERVICE ASSOCIATION
DALLAS, TEX., April 2, 1925.

To the Editor:

Just a word of thanks and appreciation for your editorial in the March 28 issue as to the list of forthcoming utility association meetings, which you are starting to publish.

This question of arranging convention dates to avoid conflict is one of great difficulty and correspondingly one of great importance, and the assistance of the ELECTRIC RAILWAY JOURNAL will be helpful.

E. N. WILLIS,
Secretary.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURG, PA., April 2, 1925.

To the Editor:

In looking over the March 28 issue of the JOURNAL, I was pleased to note on page 509 your list of coming meetings of electric railway and allied associations.

I think it is a very good thing to set aside a definite place in which to publish such a list every week. I believe there are sufficient changes to warrant this, and I am sure that this information is very helpful.

LESLEY C. PAUL,
Railway Section, Department of Publicity.

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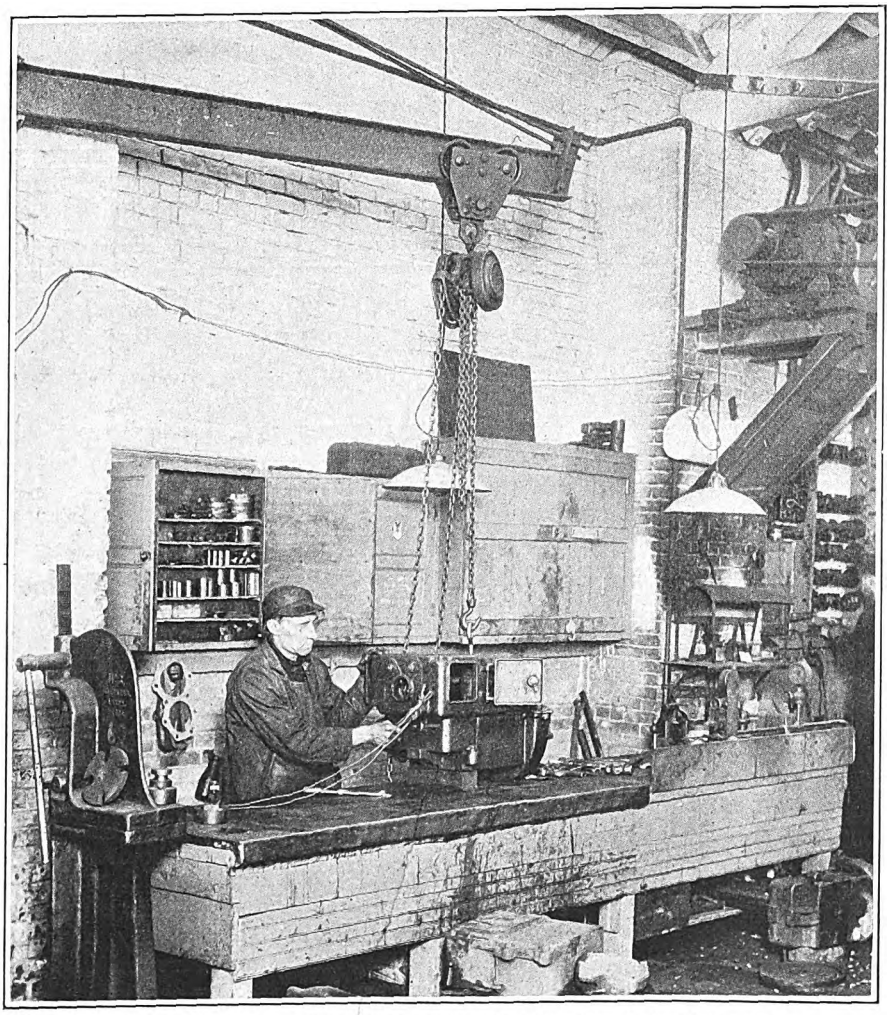
Equipment Maintenance Notes

Handy Compressor Overhauling Bench

ON A REGULAR overhauling schedule, compressors are removed from the cars and taken to the overhauling bench in the 155th Street shops of the Eighth Avenue Railroad. One section of the bench is devoted to the overhauling work and the other end is provided with gages, valves, etc., for testing the compressors after they have been reassembled. The overhauling end of the bench has a sheet-iron top which helps to keep oil and grease from the compressors. Located just at the end of the bench is a hand arbor press, which is used for pressing in bushings in various parts of the compressors and motorman's valves, when rebushing is necessary.

Much time and unnecessary walking is prevented by having storage closets immediately back of the bench. Parts which are renewed most frequently in compressor overhauling are kept in these closets, so that the workman does not need to go to the storeroom and spend time waiting for material when it is needed. A limited supply is kept in the closet, but sufficient to take care of each day's needs.

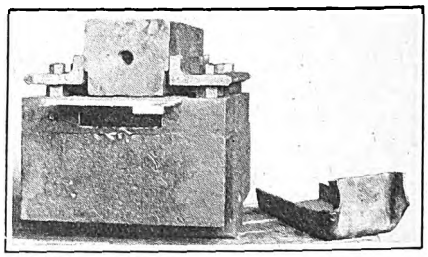
After compressors are overhauled they are given a running test on the bench. Tanks are installed underneath the bench, and the various gages are connected to show pressures and to indicate any leakages that may occur. This test insures that when the compressor is again installed on the car it will operate efficiently, and many adjustments which otherwise would be required on the car are done at the bench. A gib crane with chain block serves the bench, so that the compressors can be handled without labor.



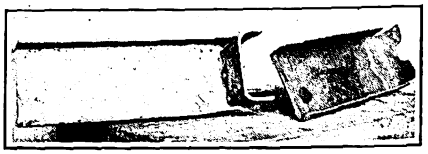
Efficiently Arranged Compressor Overhauling Bench in Shops of Eighth Avenue Railroad, New York City

Forming Pedestal Gib Plates

THE New York State Railways experienced difficulty with its pedestal gib plates wearing thin at the bottom end and breaking at the bend. To remedy this condition the railway made up dies so that the gib plates are bent with a reinforcement at the bottom and corners. An accompanying illustration shows both the old and new plates, and it will be seen that the new plate is shaped with a projection of approximately 1½ in. at the lower end on each side. The corners are also well rounded, and as the new type is formed from a plate without cutting, additional reinforcement is provided at the side of the bottom projection.



Special Forming Die Used with Pneumatic Hammer to Shape Pedestal Gib Plates



At Left—New Type of Gib Plates with Reinforced Corners and Side Projections at Bottom. At Right—Old Type of Gib Plate Previously Used

These plates are formed by using a pneumatic power hammer, and the construction of the die is shown in another illustration. This consists of a heavy base block which is arranged to fit in the anvil of the power hammer. The center part of this block is hollowed out so that the sides of the gib plate will be formed as the upper part of the die is forced down. A slight recess in the upper section,

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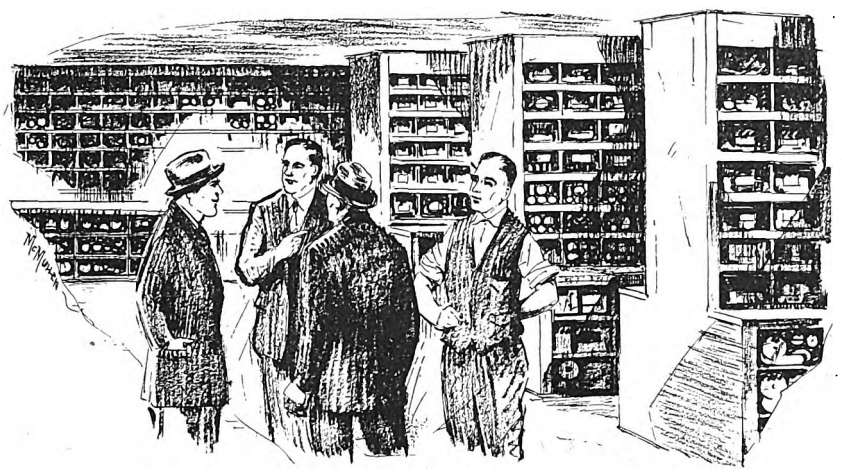
Dick Prescott Sees a Storeroom

And Is Favorably Impressed



VISITING the large Rushburg property on their trip of inspection, Dick Prescott, engineer of equipment, and Steve White, carpenter shop foreman of the Consolidated Railway & Light Company, accompanied the Rushburg engineer of equipment to the storeroom.

After being introduced to the storekeeper Dick stated the object of their visit.

"We are very much interested in your practice of eliminating duplicate parts," said Dick, "and we thought the storeroom was where the results would show up."

"You came to the right place," answered the storekeeper. "Let's come out here and you can see what we've accomplished."

Following the storekeeper out of his little office into the region of shelves and bins, Dick was impressed by the unusually clean and businesslike appearance. He noted, too, that no workmen were standing around waiting for materials.

"Now, in this section are what we classify as car-body fittings."

"You certainly have a mighty fine looking place," remarked Dick, glancing casually around.

"Thanks. We believe that a neat storeroom is the first step in efficiency. But you'll realize what reduction of duplicate parts means when I tell you this particular section occupies just about a third of the space it did two years ago."

"That, I take it," replied Dick, "is due to doing away with the many varieties of various parts."

"Exactly."

Leading them to several of the bins in the section, the storekeeper indicated the contents as he explained what had been done.

"Now, here are some examples. Two years ago we had ten different types of these grab-handle sockets. Each handle required one right-hand and one left-hand socket. Today we have three types. We had six different trapdoor handles. Now we have only one. There used to be four types of those conductor's signal bells. These have come down to one. There's our standard motorman's gong and bracket. We did have three different types and they wouldn't interchange between cars. The same thing is true of most of these handles, latches, hinges, hooks, register mechanism parts, and practically all the stock in this section. You can see for yourself that we rarely have more than two varieties of any part."

"It certainly looks like this plan is saving your company many thousands of dollars a year," said Steve White, whose many years of experience as carpenter shop foreman of the Consolidated at once enabled him to grasp the significance of this explanation.

"Yes," replied the storekeeper, "our mechanical department now realizes the saving being made in reduction of delays and handling, although it was inclined to doubt the program at first. But our own officials, outside of those in direct contact with the routine of purchasing and storekeeping, don't even now fully appreciate what we have accomplished from the statndpoint of reduced prices and prompt delivery."

"You mean that you don't have to order so many varieties of parts a few at a time?" queried Dick.

"That's it. Many of the old parts long ago became obsolete and had to be ordered in small quantities from samples. Consequently the prices were very high."

The four men moved along through the storeroom, and the obliging storekeeper pointed out many things he thought would interest the visitors. As they turned back toward the little office Dick consulted his watch.

"We certainly are very much obliged to you gentlemen," he said. "It has been mighty interesting indeed. I'm afraid, though, we'll have to hurry off without much ceremony now, as we planned on catching the interurban to Trackton this afternoon."

"You can just about make it," said the storekeeper. "Take a No. 4 car right out here at the corner. I don't envy you fellows that ride."

They had left the shop and were hurrying toward the corner, as Dick turned to Steve and said, "I wonder what he meant by that remark about the interurban?"

into which the plate fits, insures its being accurately centered over the opening in the base plate. The upper part of the die is guided by two angle irons, one on either side, which are bolted to the base.

With the plate in position for bending the power hammer drives the upper section of the die down and the sides of the plate are formed. While the plate is held firmly by the power hammer the end is bent up with a sledge hammer, and in this bending operation the projections at the bottom are left in their normal position as a reinforcement.

Meters Used as Reverse-Current Relays

THE Charleston Consolidated Railway & Lighting Company, Charleston, S. C., experienced trouble at its Five-Mile substation with two rotary converters racing when the voltage was interrupted on the a.c. feeders supplying the converters. The trouble was remedied by the use of two Sangamo type D-5 direct-current watt-hour meters arranged to act as reverse-current relays. The potential coils of both meters were connected across the main buses. The cables leading to the two machines were spanned as shunts to form the armature connections, one for each meter.

The gear trains were removed from the two meters. Leads were brought from the trip coils of the no-voltage release attachments on the machine circuit breakers. Each coil was connected to special contacts placed in the corresponding meter, one stationary and the other mounted on the meter disk. A stop placed in the meter prevents rotation in the direction opposite to the fixed contact.

With the rotary converters running at line voltage they are delivering energy to the line and the meters tend to run forward, but the stop prevents them. Should the voltage of a converter drop below the line pressure there is a flow of energy back into the machine. Then the meter disk swings backward, closing the relay contacts and opening the circuit breaker by short circuiting the no-voltage coil. This coil is in connection with a series resistor which prevents a complete short circuit.

This arrangement has provided a satisfactory type of direct-current, time-limit reverse current relay and has never failed to operate.

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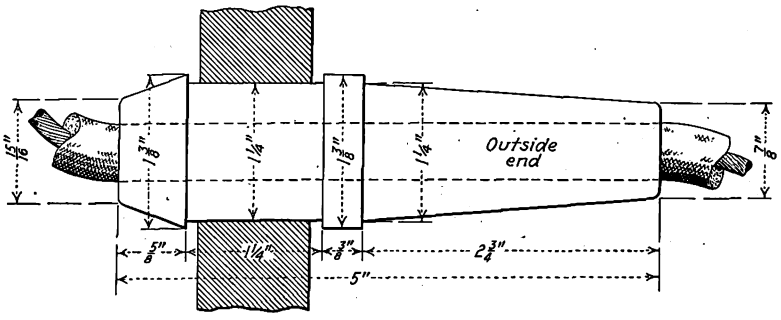
Rubber Bushing Protects Motor Leads

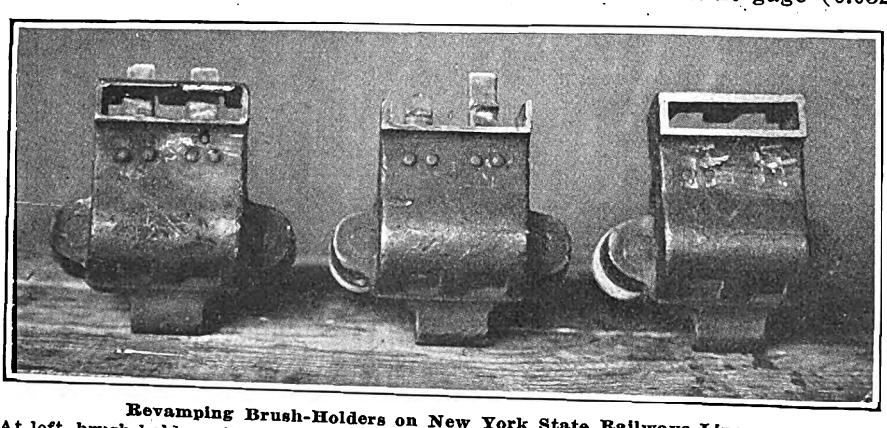
SHARP bends in motor leads, particularly at the points where they come out of the motor shell, often result in damage to the insulation and also cause breakage of the strands of the copper conductor. In order to prevent sharp bending at that point and also to provide an insulated bushing for the leads, the Department of Street Railways of the city of Detroit, Mich., uses a soft-rubber bushing of the type shown in the accompanying drawing. The end of this bushing extends outside of the motor shell for approximately 3 in. and so provides a support for the motor leads that prevents sharp bends. The inside end of the bushing is tapered, so as to facilitate ready insertion in the hole of the motor shell. The bushing is also provided with shoulders so that when once in place it will be held tight.



Soft Rubber Bushing for Motor Leads Used in Detroit that Prevents Sharp Bending

Repairing Brush-Holder Carbon Ways

WHEN the carbon brush ways of brush-holders used by the Utica lines of the New York State Railways become worn, they are brought back to standard size by cutting off the front portion and welding new cast-brass fronts onto the holders. The accompanying illustration shows the method of repair. The brush-holder at the left is one which is so worn that it requires repairing. The one in the center has had the front part cut off ready for the welding operation, while that at the right has been completely repaired. This method of repair insures an accurate fit of the brushes in the brush-holder slide and reduces troubles such as broken brushes and flashing, which result from too much clearance in the carbon ways.

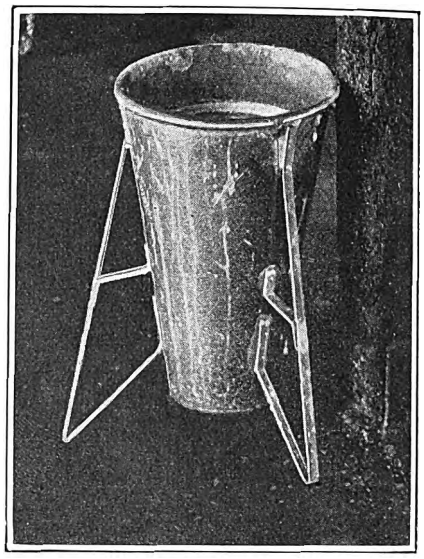


Revamping Brush-Holders on New York State Railways Lines
At left, brush-holder with worn carbon ways. In center, front section cut off preparatory to welding. At right, brush-holder after repairs are completed.

Convenient Acid Pot

SOLDERING acid is held in a three-legged conical shaped pot in the shops of the Department of Street Railways, Detroit, Mich. The pot is designed to stand on the floor instead of on a bench. Since the pot is deep and tapers toward the bottom, any splash of material falls back into the pot and is saved. Furthermore, the tapered shape causes any solid material which may drop into the pot to collect at the bottom, so that the acid can be used almost to the last drop without the necessity of cleaning the pot. A large saving in acid has resulted since this type of pot was put in use.

The pot is 12 in. high and the three legs raise the bottom an additional 1¼ in. from the floor. The inside diameters of the pot are 7¾ in. at the top and 4 in. at the bottom. The pot is constructed of No. 20 gage (0.032 in.) copper, and the inside is washed with lead. The three legs are made of ⅜-in. x ½-in. steel strap, and the bottoms of the legs are located on a 5-in. radius from the center of the pot. A removable cover is provided so that the acid is kept covered when not in use.



This Conical-Shaped Acid Pot Saves Material

Fixture for Checking Controller Drums

THE drums of platform controllers require particular attention in order to make certain that the contacts line up properly, that the star wheel is located so that the fingers will make contact at the proper points, that the stop for the controller drum does not permit overrunning of the fingers, and that the contact segments themselves have no high or low spots to cause uneven pressure of the contact fingers.

In order to make certain that these important points are not left to the individual judgment of the inspector, special fixtures have been provided at the controller overhauling bench in the shops of the Third Avenue Railway, New York City, for testing and inspecting controller drums after they have been repaired. Of the two fixtures illustrated the one in the foreground shows the construction and the one directly back of it has a controller drum in position for testing and inspecting.

The central part of the fixture consists of a cylindrical casting which is turned accurately on the inside to a diameter corresponding to the outside diameter of the segments. End-bearing supports are provided so that the controller drum can be placed in position and rotated on its own bear-

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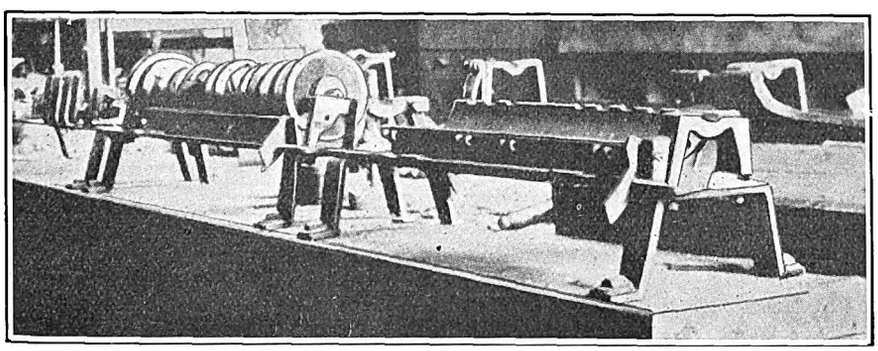
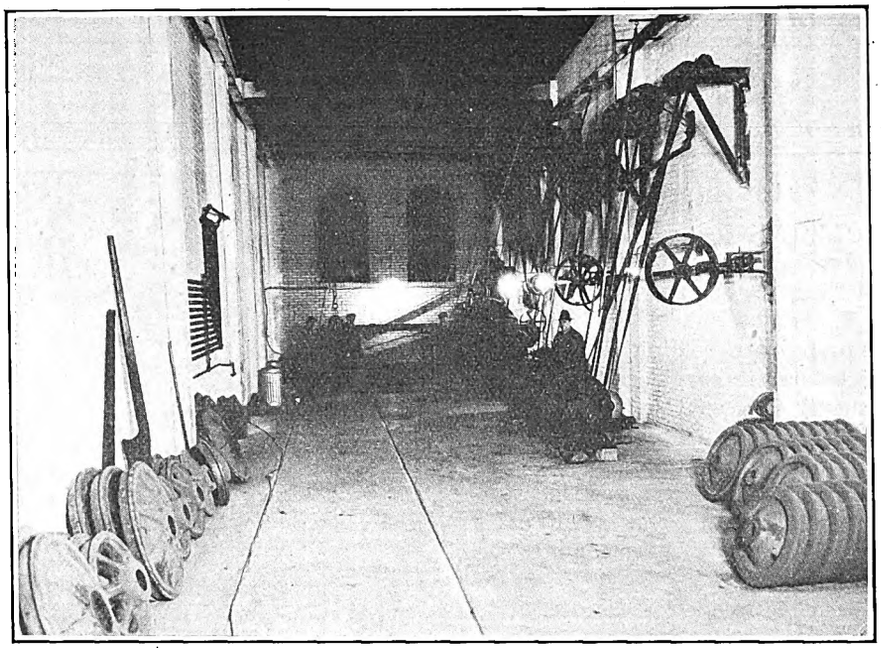
ings. As the cylinder is rotated any unevenness or misalignment of the contact segments is apparent at once. If the segments are too high they bind on the fixture, and if too low excessive clearance at the edges of the fixture results. The two edges of this semi-circular casting have notches corresponding to the positions that the various contacts should occupy along the length of the drum. Any segments out of alignment or in improper position are indicated as the drum is rotated. A pawl fits in the notches of the controller star wheel, so that as the drum is rotated the edge of the segment should line up with certain projections on the cylindrical casting. By means the ends of the contact segments can thus be adjusted accurately, so that when the drum is installed in the controller they will function properly. The opposite end of the fixture has a stop arrangement which makes contacts with the stop on the controller drum. The back edges of the segments are lined up by means of this stop to a position which prevents over-running or improper position of the fingers when the drum is in the full series or full parallel running positions. This fixture has proved a great time saver in making accurate inspections and adjustments.



Fixtures for Inspecting Controller Drums Insure Accurate Adjustment

Special Wheel Shop in Dayton

ALL wheel work of the City Railway of Dayton, Ohio, is done at the company's shop in a room that is set aside for this purpose exclusively. As the amount of this work is insufficient to keep the various machines busy continuously, the arrangement adopted enables wheels to accumulate as they are taken off the cars or axles until there is enough work on hand to allow it to be done efficiently. By setting aside a special room for this work the machine shop is kept clear of accumulated wheels.

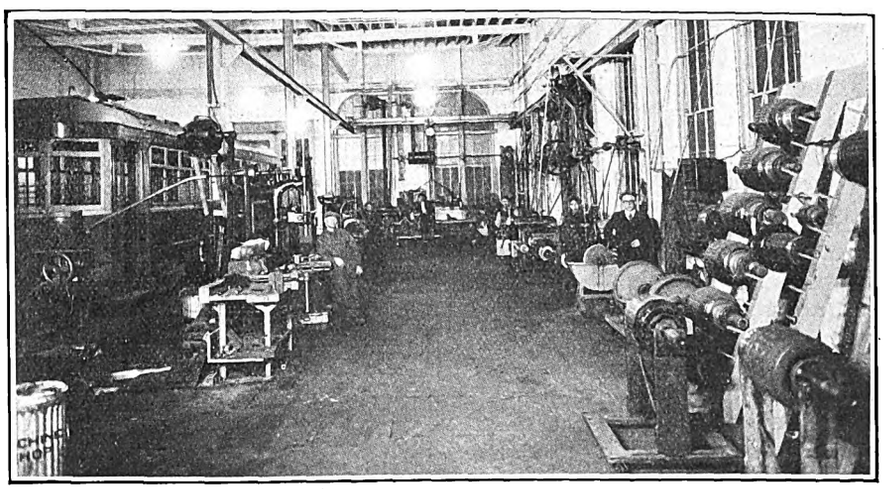


A Special Room Is Set Aside by the Dayton City Railway for Doing All Wheel Work Except Turning

Included in the machine equipment is a hydraulic press, a boring mill and a grinder. The shop management considers that the amount of wheel turning to be done does not justify the expense of a special wheel lathe. Consequently a large engine lathe is used both for wheel turning and for other work. Due to this arrangement, the turning is done in the general machine shop and not in the special wheel room.

In the wheel room a small overhead hand-operated crane serves the various machines and expedites handling of the wheels both before and after mounting on axles. The wheel grinder is used to true up the treads and flanges before they become so badly worn as to require turning. In this way considerable additional mileage is obtained and expensive turning is frequently avoided.

A small emery grinder is also included in the wheel room for sharpening tools and for other miscellaneous purposes. The accompanying views of the general machine shop illustrates the neat appearance and saving in room that is obtained by keeping the shop free of bulky wheels and machinery.



By Keeping the General Machine Shop Clear of Accumulated Wheels, a Ship-Shape Appearance Is Maintained and at the Same Time There Is More Room Available for Other Work

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New Equipment Available

Automatic Welder

FOLLOWING several years of development and trial, the General Electric Company, Schenectady, N. Y., is now marketing a line of automatic arc-welding equipments. Heretofore, it has been the custom to supply the separate parts only.

The new outfit is expected to find its principal application in the construction of standard products, repairing undersize shafts or axles and building up sharp flanges on car wheels.

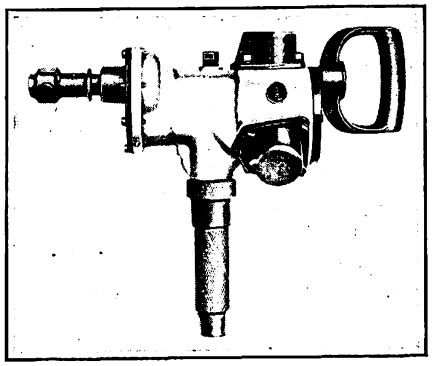
Speed of production, according to General Electric engineers, is especially marked when comparison is made between the automatic arc welder and either hand arc welding or hand gas welding. A complete outfit can be operated by a man and helper, while the completion of an equal amount of hand work in the same time would necessitate the use of four or more men. Estimates also indicate a lower overhead expense than with gas welding, excluding the item of labor. The use of push-button control provides simplicity and ease in operation. Uniformity of finished product and space saving by the reduction of the number of workers and quantity of stock on hand are among the other advantages claimed for this equipment.

A complete outfit consists of an automatic welding head and control panel, travel carriage and clamping device. Where it is desired, in order to meet special circumstances, the travel carriage and other component parts of the equipment may be assembled by the purchaser with his own device for holding the work in position.

Pneumatic Drill

SIZE DD of the line of light-weight reversible pneumatic wood-boring machines has been brought out by the Ingersoll-Rand Company, New York, N. Y. This drill is suitable for boring holes up to 1 in. diameter. Features of this machine include a three-cylinder motor, light-weight aluminum case, steel bushings cast in place in all the bearing holes, renewable crankpin sleeves and renewable cast-iron cylinders.

The rotating parts of the motor



Pneumatic Wood-Boring Machine

are all accurately balanced to eliminate vibration and wear. The new size drill has an average working speed of 705 r.p.m. It weighs 15 lb., including a spade grip handle and bit chuck, which are furnished as standard with this type drill. A breastplate or feed screw can be substituted in place of the grip handle when so desired, and a drill chuck in place of the bit chuck, so as to make the drill adaptable to a wider variety of work.

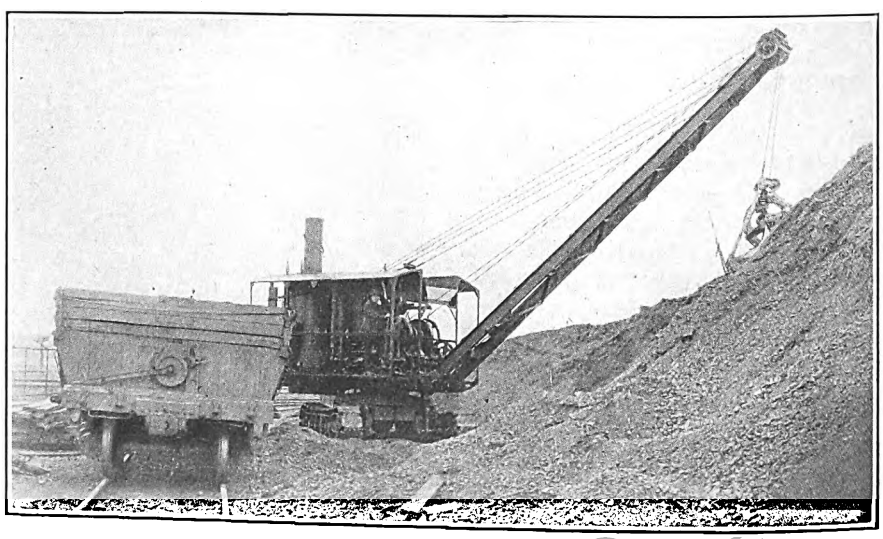
Crawling Tractor Crane

AN IMPROVED 10-ton crawling tractor crane has just been developed by the Industrial Works, Bay City, Mich. This new type is similar in outward appearance to former types, but the design embodies new engineering features, such as split gears for propelling, double clutch mechanism, long tractor belts and increased speed.

The system of split gears provides for controlling each tractor belt separately. Two concentric vertical propelling shafts at the axis of revolution lead to two independent but concentric trains of spur and bevel gears, each operating one tractor belt. Each belt is directly controlled by two powerful friction clutches and brakes in the revolving upper works, which give independent, definite and easy control over each belt while propelling. An all-gear drive from the engine to the sprockets with no chains in the mechanism is thus provided. Maneuvering the tractor in close quarters becomes comparatively simple through the use of the friction clutch and hand brake for each tractor belt. The provision for steering and propelling by friction clutches is an exclusive feature of this design.

The center distance between the two end sprockets is 10 ft. This long tractor belt gives increased stability for wide range of operation. Separate levers are provided for operating each function of the crane. These are placed on the operator's platform in the revolving upper works convenient to the operator. Particular attention has been given to the combining of strength with light weight and to making parts accessible so that they can be maintained easily. All speeds have been increased 25 per cent over those of previous cranes manufactured by the company. The increase in speed should produce corresponding savings in time and cost.

The crane is constructed so that it may be operated by either a steam engine, electric motor, gasoline motor, or fuel oil engine of the Diesel type. It is readily convertible into a shovel or pile driver, and any equipment intended for operation on a boom can be applied, such as clamshell or dragline bucket, electromagnet, or hook and block for grappling.



Loading a Dump Car with the New Tractor Crane

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Association News & Discussions

Master Mechanics Discuss Freight Equipment Interchange

SOME 40 members of the new Central Electric Railway Master Mechanics' Association met at Fort Wayne, Ind., for their first regular meeting following the organization of their association. President T. H. Nicholl presided. In accordance with the previously arranged program, the meeting was devoted almost entirely to a discussion of problems connected with the interchange of freight equipment.

E. B. Gunn of the Western Ohio Railway, acting as a committee of one, invited a steam railroad mechanical executive of long experience to take part in the meeting for the purpose of explaining steam railroad practice in the use of inspection cards for interchange equipment under the American Railway Association rules. This practice was compared in detail with that of the electric lines in the C.E.R.A. territory, and it quickly became evident that the meeting was of immense value in clearing up a number of questions regarding the proper use of the various inspection cards. It was the consensus of opinion that the committee on interchange rules would probably continue to function as a standing committee, not only to prepare such revisions of the rules as become necessary from time to time, but also to serve in the capacity of an advisory body on their application and interpretation.

A report of the committee on grab handles was presented by Chairman A. W. Redderson. The committee had prepared a drawing showing the suggested location of all grab handles and related apparatus at the ends of freight cars. This was discussed in some detail. It was decided that each member would be given an opportunity of comparing the suggested standard arrangement with the conditions on his own property and equipment. While the proposed arrangement of grab handles varies somewhat from steam road practice, the provisions of the federal safety appliance act were carefully checked with the proposed standards, so that the arrangement suggested would come within the provisions of the law.

Several slight changes in the constitution of the association were adopted. The membership was broadened to include three grades—active, associate and honorary. Active membership is open to all men in charge of mechanical department work on lines that are members of the C.E.R.A., and to their principal assistants. Not more than two men can be active members from any one property. Other mechanical men in the territory, and mechanical men from properties not members of the C.E.R.A. are eligible to associate membership. These have all the privileges of active members except the right to vote or to hold office. Honorary members, as before, are elected from engineers in the industry, when proposed by five active members.

The delegates to the meeting were guests at luncheon of the Indiana Service Corporation. In the afternoon an inspection trip was made to the repair shops in Fort Wayne, and to the shop site and newly completed carhouse of the local company.

In accordance with the new constitution, there will be three regular meetings of the association per year. These will be held on the second Thursday of February, May and September. It was decided to hold a special meeting on one afternoon during the C.E.R.A. summer meeting at French Lick, and the next regular meeting at Anderson, Ind., on Sept. 10.

N. F. P. A. Meets in Chicago

THE National Fire Protective Association will meet at the Congress Hotel in Chicago on May 12-14. At this time the proposed new code for car and carhouse wiring, which has been studied by that association in cooperation with a special committee of the American Electric Railway Engineering Association, will come up for adoption.

Annual Meeting of New York Association

THE New York Electric Railway Association, whose annual meeting will be held at Bluff Point, N. Y., announces that the management of Hotel Champlain has agreed to make a rate during the meeting of $10 per day, per person, including meals and the banquet. This year the New York State meeting will extend over two days, Friday and Saturday, June 26 and 27.

Buses Needed at C.E.R.A. Meeting

THE committee on transportation for the coming meeting of the Central Electric Railway Association to be held at French Lick Springs, Ind., on June 2-4 is endeavoring to provide buses to carry delegates from Indianapolis or from some point on the Interstate Public Service Company's lines to French Lick. Since bus manufacturers will probably plan to have sample equipments at French Lick for the inspection of those in attendance, the committee will welcome the use of these buses to assist in transporting the delegates to the meeting. Manufacturers who desire to place one or more vehicles at the disposal of the committee should communicate as soon as possible with the chairman, L. M. Brown, general superintendent Interstate Public Service Company, J. F. Wild Building, Indianapolis, Ind.

American Association News

American Executive Committee

THE executive committee of the American Electric Railway Association held a regular meeting at association headquarters in New York on April 14. Executive Secretary J. W. Welsh gave a statistical report of the activities of the association for the year 1924 and a statement of revenues and expenses of the association for the first five months of this year. Expenditures made in connection with the new headquarters of the association were comparatively slight, as most of them had been made by the owners of the building. Mr. Stevens reported that a lease for the offices for the Advisory Council on the twelfth floor of the same building had been approved.

For the committee on national relations Mr. Henry stated that the question of determining the scope of the amended transportation act of 1924 in so far as it applies to electric railways had been considered carefully. Electric locomotives used in interstate commerce would be subject to the act, according to the opinion of the committee's legal adviser. Electric motor cars, on the contrary, were not considered to be under the act. Mr. Henry stated that it was impossible to put the report of this committee in shape for final action at this meeting of the executive committee.

Mr. Storrs reported on the regulation of motor buses in interstate traffic, which has become desirable on account of the recent action of the United States Supreme Court. He asked for suggestions on proposed legislation. A general discussion followed the presentation of Mr. Storrs' report, in which it was brought out that this situation is the most serious one that has come up before the association in recent years. A motion was adopted to the effect that the entire matter be left in the hands of the committee on national relations.

Considerable discussion took place on proposed changes in the constitution and by-laws as given in the report of a special committee and presented by C. R. Ellicott. A number of suggestions were made and the subject was referred back to the committee for further study.

Mr. Storrs stated that with regard to the Hoover Safety Conference the

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American Electric Railway Association has gone forward with the idea proposed by Secretary Hoover. It is the only association that has actively furthered the work up to the present time.

For the committee on company and associate membership Mr. Palmer stated that there had been a gain of four company members since the last executive committee meeting.

The association appropriated a sum of $250 for an exhibit before the Associated Advertising Clubs of the World at its meeting to be held in Houston, Tex., this spring.

Speaking for the committee on arrangements for the Midyear Dinner, Mr. Hanna stated that the net number of tickets sold was 659. Out of the receipts it was possible to pay all bills and leave a surplus of $65.

There was a net gain of twelve individual members, according to Mr. Morgan, chairman of the committee on company section and individual membership. The executive committee approved Mr. Morgan's viewpoint that in the case of a holding company with a number of subsidiaries the subsidiary having the largest receipts should be the one selected for membership in the association, provided a number of such companies were not to be included.

Executive Secretary Welsh read the report of the exhibit committee for Chairman Morgan. The rate for space at the coming convention has been fixed at 65 cents per square foot, the same as at the last two conventions. The association has the permission of the Atlantic City authorities to place ten street cars on the boardwalk. A track has been laid up to the pier so that the handling charges for street cars will be very much less than in former years. The 65-cent rate for space was approved.

A resolution was adopted to the effect that the association frown on exhibits at locations outside the pier or at places not designated by the committee on exhibits. A proposal was made for a separate day for the inspection of the exhibits. Upon motion it was recommended that Wednesday, Oct. 7, be set aside for this purpose.

A form of uniform bill for adoption by state legislatures to promote highway and crossing safety was read by Mr. Briggs. This was designed to cover uniformity in legislation so that there would not be confusion and ambiguity as to the procedure to be followed by motorists. The matter was referred for action to the representatives of the association on the conference on street and highway safety of the National Safety Council.

A contribution to the conference on street and highway safety was ordered by the executive committee. A resolution from the Transportation and Traffic Association executive committee was presented to the effect that the former association requested the American Association to refer all matters regarding street and highway traffic to the T. & T. Association.

Invitations were presented by Mr. Coates to all A.E.R.A. members to attend the Central Electric Railway Association convention at French Lick June 2-4, and by Mr. Morgan to attend the New York Electric Railway Association meeting at Bluff Point, N. Y., on June 26-27.

It was moved and seconded that the next meeting of the executive committee be held at the Windsor Hotel, Montreal, Canada, on June 10. This date was selected on account of the convention of the Canadian Electric Railway Association, which had sent an invitation to the American Association to hold its next executive committee meeting in connection with that event.

Members present were President J. N. Shannahan, F. R. Coates, L. S. Storrs, R. P. Stevens, J. W. Welsh, H. D. Briggs, Paul Shoup, L. H. Palmer, J. H. Hanna, H. B. Flowers, E. F. Wickwire, Harry Reid, C. E. Morgan, E. P. Waller, G. H. Harries, C. L. Henry, R. I. Todd, Myles Lambert for H. D. Shute, and E. C. Faber for Barron Collier.

COMING MEETINGS OF *Electric Railway and Allied Associations*

April 20-25—International Regional Planning Congress, Hotel Pennsylvania and Grand Central Palace, New York City.

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 26-27—Regional Motor Transport Conference, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Claims Executive Committee

A MEETING of the executive committee of the American Electric Railway Claims Association was held at the association office, New York, on April 15. Those in attendance were H. D. Briggs of Newark, N. J.; J. S. Kubu of Cleveland; F. G. Herrell of Knoxville, Tenn.; and George Lorenz of Chicago. Mr. Lorenz represented G. B. Hellmuth, and Dr. Hart represented E. Fisher, members of the executive committee. The principal work done was to go over the program for the year and the assignments of the different committees. Other topics considered were the marking of car steps with the words "Watch Your Step," and various methods of resuscitation.

Use the Association Facilities

CIRCULAR letters have been sent out from association headquarters to all members and also to executives of non-member companies outlining briefly the various activities of the American Electric Railway Association and the services it renders to its members.

During the year 1924 some 13,300 requests for information were made of the association. A large share of these required a considerable amount of work for answer. "Too often," says Executive Secretary J. W. Welsh in his letter of transmittal, "some members avail themselves of our services only when they are in serious trouble. Of course, we are glad to oblige and do our best. The crisis passed, all too frequently they forget us. We send them regular announcements of the material and information at hand, but hear little from them again unless such an emergency arises. If one does, they come back. And every time they return and look us over they express surprise at the amount of help we can give them. Such members use us merely as an emergency truck in trouble."

The desire of the association, as stated in the letter, is to get all members to use the services of the association as a supply car. In this way it is possible to draw on the suggestions of many of the 500,000 workers who are engaged directly or indirectly in the electric railway industry.

Special Reports Available

THE following special reports have been prepared and are available to member companies in good standing upon request:

Bulletin No. 16—Working conditions of electric railway trainmen—This gives data for more than 200 companies on hours of labor, length and types of run, overtime rates, extra compensation allowed for special work, labor turnover, vacations allowed and other miscellaneous factors affecting working conditions.

Bulletin No. 17—State Regulation of Motor Bus Common Carriers—Contains copies of all state laws providing for the general regulation of motor bus common carriers, together with copies of rules and regulations for motor bus operators prescribed by state commissions under the laws. The compilation is preceded by an analytical index and digest giving ready reference to particular sections and listing states that have legislated on the various subjects. Special tax legislation is not included except where it is a part of a general regulatory act. All taxation measures and other miscellaneous acts affecting motor bus operations in any way will be summarized and indexed in a later compilation.

Bulletin No. 18—Rate of Return Allowed Electric Railways—Extracts from decisions of public utility commissions in which the rate has been fixed after an official determination of the amount upon which the company is entitled to earn a return.

Bulletin No. 19—Motor Bus Operations in the United States, Part IV—This is the fourth installment of a list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operators and where the information is available, statistical data on the character of their operations. The present installment cover the states of Illinois, Pennsylvania and South Dakota.

In addition to the above supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies (Bulletin No. 20) have also been prepared, bringing them down to date.

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The News of the Industry

Detroit May Proceed Alone

Rapid Transit Plan May Be Confined to City, with Near-by Towns Coming in Later

A resolution providing that the Rapid Transit Commission of Detroit, Mich., submit to the City Council its plan of routes to include Detroit only has been prepared by P. J. M. Hally, attorney for the commission, and placed in the hands of John C. Lodge, president of the Council. For the present any route into or through the surrounding municipalities will be eliminated. The commission has pledged itself to submit its plan of routes for the city to the electors of Detroit at the first opportunity.

The resolution was drafted after the commission became exasperated by the various obstacles placed in the way of passage of its bill and after Governor Groesbeck had expressed doubt as to the constitutionality of the bill presented to the State Legislature. The Greater Detroit program is given up and a plan for city lines only is to be considered now.

It is cited by the commission that it is now possible for Detroit to proceed within its own limits and postpone for the time being any consideration of the surrounding municipalities. It is realized that the congested condition on certain downtown thoroughfares constantly grows worse and that the situation may not be remedied by any other means than rapid transit, if the city's growth is not to be retarded.

The passing of the resolution by the City Council will make it imperative for the Rapid Transit Commission to remodel its plan, which contemplated routes serving Highland Park and Hamtramck as well as in Detroit.

Highland Park and Springwells are the homes of the Ford industries and Hamtramck is the home of the Dodge Brothers' plant, so to leave out these two municipalities will necessitate a change in the rapid transit plan.

Members of the commission expressed the belief that Detroit could build itself a system of elevateds and subways under the 1923 legislation or under the financial plan approved last fall in a charter amendment. The 1923 legislation contained the so-called Nagel plan of financing, which provided that the city authorities could set aside any value found to accrue to property by reason of a subway in a separate column and tax this valuation only for subway purposes at the regular tax rate. The latter plan provides for splitting the cost of rapid transit lines so that 19 per cent would be raised by a tax on the city at large, 51 per cent by assessments on real estate in benefited zones and 30 per cent through fares.

At the State Capitol the original bill sponsored by the Detroit Rapid Transit Commission has been pigeonholed. This measure provided for the spending of $200,000,000 for the construction of about 40 miles of subways, elevated or surface rapid transit lines. The Wayne County delegation to the Legislature fixed $60,000,000 as the limit that may be expended in the construction of the proposed rapid transit system without again petitioning the Legislature for revision of the financial limitations.

A substitute bill has been proposed which it is reported has been agreed to by various Detroit commercial organizations. This bill, it is understood, contemplates making $54,000,000 available from bond issues and $4,500,000 annually by direct taxation, leaving the question of limitation of special property assessment to the discretion of the City Council.

A new bill sponsored by the Governor would tend to set aside the plans of the Rapid Transit Commission in so far as changes in the existing state laws are concerned. It would necessitate the Council submitting charter amendments on which detailed plans of the commission could be based. When approved by the voters, the amendments would then have to be submitted at a separate election to obtain the adoption of the plan proper. The purpose is to let the people of Detroit decide just how they want the proposed rapid transit system built and financed and who shall take charge of the work.

Peace in Philadelphia

Mr. Mitten Still Opposed to Conowingo Power Plans, but Withdraws from Effort to Secure Control of Philadelphia Electric Company

THOMAS E. MITTEN, chairman of the executive committee of the Philadelphia Rapid Transit Company, Philadelphia, Pa., remains the implacable foe of Conowingo. That is the sum and substance of the recent battle between Mr. Mitten and the Philadelphia Electric Company which kept the City of Brotherly Love stirred up for several weeks. But sum and substance are not all. There were lively times in Philadelphia while the controversy raged—times too lively to be dismissed with a single sentence.

Conowingo, it should be explained, is the $52,000,000 development proposed to be carried out in the interest of the Philadelphia Electric Company in anticipation of its future power needs. P. R. T. lined up against the Conowingo project because "it is purely and simply a banker's project for the sale of securities." As the *Public Ledger* phrased it, P. R. T. contended that Conowingo was "forced upon P. E. by the Drexel interests for their own profit and for the profit of the engineers who are to build it, if it shall be authorized, upon terms which involve no risk to themselves and all to the P. E." As that paper saw it, "P. R. T., as the largest customer of P. E., undoubtedly has a vital interest in the question it has raised."

The railway did not mince words. Neither did the Philadelphia Electric Company for that matter. The language of the latter was, perhaps, more reserved, but it was no less telling than was that of the railway. Mr. Mitten said that "the present controversy is a contest between the old order and the new." He was not opposed to the development of water power, but he was opposed "to the development of any water-power project for the benefit of bankers and promoters." "The rule for the rich," said Mr. Mitten's spokesman, "must be the same as for the poor." The Drexels—meaning Drexel & Company, the bankers—dominate P. E. by virtue of P. E. stockholders' proxies, charged Mr. Mitten.

But Mr. Mitten went farther than that. In a plea for proxies he offered P. E. stockholders P. R. T. management, with the assurance of an additional 2 per cent upon P. E. common stock—an increase in the dividend from 8 per cent to 10 per cent. It was a direct appeal to the pocketbook. The annual meeting of the Philadelphia Electric was at hand. Big doings loomed ahead. It was, indeed, an unusual situation, this impending battle for control. Innuendoes were hurled about with reckless abandon, as they say.

For a while P. E. remained quiet. Then it, too, entered the fray. It said that every thoughtful citizen should resist "the Mitten attempt to grab control of the Philadelphia Electric Company for selfish and ulterior reasons." Yes! Those were the exact words. To illustrate "the absurdity" of the Mitten proposition, it said that if "P. R. T. got current from P. E. entirely free it would make a difference of only one-quarter of 1 cent per passenger carried in 1924, against the lowest fare of 7½ cents, which would have no practicable effect upon trolley fares in Philadelphia." Moreover, it indicated that the yearly increase in business to it from sources other than the railway was greater than the total of business by the P. R. T. from the P. E. Mr. Mitten's yearly consumption of power, if withdrawn, would not hurt P. E. much, anyhow. Moreover, P. E. sought to show that whereas it had reduced rates the tendency of fares on the lines of the Philadelphia Rapid Transit had been upward. It also

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printed a comparison from Moody's to show the difference in the margin of safety between P. E. securities and P. R. T. securities.

The fat certainly was in the fire. Meanwhile, the local papers took a hand. The *North American* discovered that the New York State Public Service Commission had declined to allow the Buffalo system to charge up to expenses the fees it pays Mitten management. The *North American* even suggested that the Pennsylvania commission "ascertain how much the Buffalo activities cost the P. R. T. in the way of time and energy expended by Mitten Management, Inc., for which the P. R. T. is paying more than $300,000 a year."

If Mr. Mitten could appeal to P. E. stockholders, W. H. Johnson, president of the P. E., could certainly appeal to his own partners in the electric company. And he did. Mr. Johnson's advice to the stockholders of his company was "to consider well a proposition to put power into the hands of those who are publicly attacking your company to promote their selfish interests."

And so the battle went into its final stages. It was exhaustive and exhausting. Necessarily, this is the barest outline of it. It all ended on the night of April 5 in this letter addressed by Mr. Mitten to the chairman and the president of the Philadelphia Electric Company:

> You are hereby respectfully informed that the campaign of this management to secure the proxies of the stockholders of your company has been this day discontinued and that the proxies thus far secured will not be voted in opposition to your management at your annual meeting.
>
> Your more than 20,000 small stockholders were so impressed with your published assurances that you were still in control that they, over and over again, expressed a willingness to lose all that they had invested in your company, if that should be the outcome, in order to stand by you in response to your call.
>
> This management having itself survived with its own company against the opposition of its bankers only a few years ago, through the rallying of its own employees and stockholders—much as your employees and stockholders are now rallying to you—fully appreciates the honor tendered you in recognition of past service, as well as the greatly added responsibility which now rests upon you.
>
> This management hopes most sincerely that the result of this contest will make you dominant in the affairs of your company and enable you to adequately protect the interests of those stockholders who have so signally expressed their confidence in you.
>
> NOTE—P. R. T. must continue its fight against the Conowingo power project—for reasons already given to the commission.

And so finis was written to the matter except for the fact that "P. R. T. must continue its fight against the Conowingo power project—for reasons already given to the commission."

Mr. Johnson's only comment for publication was that "Mr. Mitten's letter is as broadminded as it was unexpected. These two managements have always worked in harmony in the past and it is my hope that they will continue to do so in the future."

At which Philadelphia breathed a sigh of temporary relief.

1,120 Tickets Sold Under Youngstown Plan

The weekly ticket plan making possible the 5-cent fare on the lines of the Youngstown Municipal Railway, Youngstown, Ohio, will be continued for another week. During the first trial week Harry Engle, local street railway commissioner, reports that 1,120 tickets were sold. Mr. Engle has interpreted this to mean that only the few persons who use the cars regularly four or more times a day bought tickets.

Chicago Matters Before State

Traction Issue Likely to Be Before Legislature—New Co-ordination Proposals Outlined

A flood of legislation is the aftermath of the Chicago municipal traction defeat. City officials and campaigners scattered to resorts and the whole question was taken up by the mass of state Assemblymen, of whom there are twice as many in Chicago as Aldermen. Springfield, the state capital, henceforth will probably be the scene of many hot traction battles.

Henry A. Blair, head of the Chicago Surface Lines, arriving home ten days after the election from a trip, found his co-ordination, service-at-cost plan the leading one before the citizens, but its fruition dependent upon an amendment to permit a new type of franchise to utilities. This gives Governor Small the whiphand in future.

The Blair plan is rivaled by one of Samuel Insull, head of the elevated lines, but Mr. Insull did not go so far in co-ordination and other provisions highly desired by the city. Both plans are dependent upon co-operation between the two men who drew them.

The Blair plan:

> An indeterminate, or "terminable," franchise subject to "good behavior," or a twenty-year franchise to which additional periods can be added every ten years after the franchise has run half its life.
>
> As much subway as can be built with the $40,000,000 the city has received from the surface lines under the present franchise.
>
> Unified operation of surface and elevated.
>
> Auxiliary bus service.
>
> Extensions to double present carrying capacity.
>
> Rapid transit to every part of city.
>
> Service at cost.
>
> One fare with universal transfers.
>
> Provision for city purchase by direct payment or amortization.

"It should be possible," says Mr. Blair, "for a citizen to board a street car in front of his house, transfer to a rapid transit train and enter the business district through a subway, all for one fare."

The plan calls for $105,000,000 expenditure in six years and a system capable of carrying 2,000,000,000 revenue passengers a year.

This and other plans will come before the reorganized City Council under an order by Mayor Dever when his plan was defeated. He said it was evident that the people did not desire what he had to offer and it was now their turn to show what they wanted.

That the result of the election was a decided compliment to the Chicago Surface Lines and the elevated roads is conceded. Throughout the campaign speakers called the surface lines the best plant in the United States and a bargain at $163,000,000. Clean, well painted, fast running cars, company supervisors at all important points helping passengers and traffic and general good feeling between citizens and company served to bear this out.

Union at Cleveland Wants 18-Cent Increase

The car men's union at Cleveland, Ohio, has voted to demand a wage scale of 73 cents an hour for the first three months of service, 75 cents an hour for the next nine months and 78 cents an hour for all men in service more than one year. Their present wage scale is 55, 57 and 60 cents.

The men insist that their demand, to be presented to the Cleveland Railway before May 1, is really an increase of only 6 cents an hour, inasmuch as a board of arbitration last June granted them an increase of 12 cents an hour. This award of the board, however, has been rejected as illegal by both the Common Pleas Court and the Court of Appeals in Cleveland. The men are now attempting to have the case heard in the State Supreme Court.

The company's viewpoint is that the men are really asking an increase of 18 cents, inasmuch as the award of a year ago was illegal and the men have never received it. John J. Stanley, president of the company, has indicated his willingness to give the men an increase of 5 cents an hour.

If the State Supreme Court sustains the verdict of the Court of Appeals, not only will the union not get the 12 cents an hour awarded a year ago, but no new agreement will be entered into between the company and the union, inasmuch as the Court of Appeals has held that the closed shop provision in the original contract makes a proposal of this kind null and void on the ground of public policy.

So far the men have not formally presented their new demands to the company and it is not likely they will do so until the State Supreme Court has decided whether or not it will hear their appeal from the decision of the Court of Appeals.

Third Avenue Railway Joins New York Bus Bidders

The bus franchise application of the Third Avenue Railway, New York, asking for 26 Manhattan and Bronx routes to be operated at 5 and 10 cent fares, was delayed in reaching the office of the franchise bureau of the Board of Estimate. It was made public on April 10, bringing the number of applications filed up to 27.

The Third Avenue Railway and the New York Railways are the only two traction companies to bid for a franchise for routes proposed by the Municipal Board of Transportation. Neither the Interborough Rapid Transit Company nor the B.-M. T. renewed its application. These companies were conspicuous contenders for the franchises up to the time Mayor Hylan scrapped all applications and called for new ones along the lines laid down by the city board.

The Third Avenue Railway proposes a fee to the city of 2 per cent of the annual gross receipts and a guaranty of $25,000. It intends to operate within two months from the date of granting the franchise. The Surface Transportation Corporation, the bus subsidiary, will be run by the operating departments of the Third Avenue Railway.

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New Buffalo Fare Probably Insufficient

The 8-cent fare recently authorized by the Public Service Commission is insufficient and a still greater increase is needed if the International Railway, Buffalo, N. Y., is to undertake track and rolling stock improvements. Herbert G. Tulley, president of the railway, has so informed the commission and the municipal authorities. The commission a month ago allowed the company to increase its fare from 7 to 8 cents. It now is reported the company wants a 10-cent fare on all local lines. Mr. Tulley said:

> The International avers that its income under the present rate of fare is sufficient to meet only the bare operating costs of its property. The imposition of any additional track, roadbed, rail or paving costs without a corresponding increase in the rates of fare would work a financial burden which would be impossible for the company to carry.

A conference attended by representatives of the municipality, the Public Service Commission and of Mitten Management, Inc., which has the contract for the operation of local and interurban lines of the International, was held in Buffalo on April 15. It was called by the commission to discuss the report covering traction service recently made by the commission following an investigation by engineers of the utilities board. The report was not made public prior to the conference.

Traction representatives at the conference included Thomas E. Mitten, chairman of the board; J. A. Queeney, vice-president of Mitten Management, Inc., and Nelson Robinson, New York.

Minnesota Commission Will Hear Bus Application in May

Passed by the Legislature, a bill awaits only the Governor's signature to put Minnesota's bus lines under control of the State Railroad and Warehouse Commission. I. D. Bowen has been named by the commission to direct administration of the new department.

The law requires every bus line, of which there are some 50 with 600 buses, to take out a license to operate each route. The commission will establish routes and rates of fare, and with each application the bus company must show the public necessity and the convenience before the license can be granted. In fixing the rate of fare and routes the commission must consider the effect of the service on the railroads and prevent duplication of service as far as possible. Parties under the law are the companies, local government units, railroads and the public. The decisions of the commission are subject to appeal to the courts. This law places the subject of jitney buses under control of the state instead of the city councils.

Under the new law the Twin City Motor Bus Company, owned by the Minneapolis Street Railway, must have licenses for its lines between Minneapolis and St. Paul, between St. Paul and Stillwater, Minn., St. Paul and White Bear, Minn., and between the Lake Minnetonka station at Glen Lake and the Glen Lake Sanitarium. Prospective lines ordered by the City Council of Minneapolis at the ends of various trolley lines must be approved by the commission.

Until the permanent rate of fare matter is settled by the State Railroad and Warehouse Commission the Twin City Rapid Transit Company cannot complete its plan of still further improving the Twin Cities system.

The Railroad and Warehouse Commission will have its first hearing on bus line operations early in May.

Horace Lowry, president of the Twin City Rapid Transit Company, said:

> The attitude and relationship of the street railway are not changed by the passage of the bus bill. Our position is the same as it has been in the past. We shall continue to try, with the city, to work out such plans as conditions may make practical and desirable from the standpoint of public service. Our duty and our interest lie with the city and the bus law will only impose a change in the legal formalities and not in the essence of relationship with the city. When plans for bus extensions or inaugurations have been worked out that are satisfactory to the city and when we have the approval of the city, we will then apply to the State Railroad and Warehouse Commission under the terms of the law.

Denver After Coffin Award

Denver versus Dallas. That is the lineup. It is a competition, and Denver makes no bones of the fact that it is going to be keen. The object—the Coffin prize. Jimmie Adams, the genial superintendent of transportation of the

Lucile of Denver "Times" Talks to Conductor

Denver Tramway, has started a campaign that is getting into the papers, just as did the recent one in Dallas. For instance, on April 7, the Denver *Times* had a feature by one of Denver's best, cutest and slangiest little reporters. The subject was Miss Pitcaithly, about whom the ELECTRIC RAILWAY JOURNAL had a story recently. The Denver team is reported to be running strong with the batting average high and errors reduced to a minimum. In a folder issued recently the Coffin prize committee of the Denver Tramway said:

> Fort Worth captured the prize for 1924. Now every Fort Worth citizen is an enthusiastic booster for the boys of the Northern Texas Traction Company.
>
> "We've got the best street railway in the United States," is the proud boast of the car riders of Fort Worth.
>
> Let's make 'em add "except Denver!" to their boasting.
>
> The American Electric Railway Association, through which the prize is awarded, will name the 1925 winner next October, during its annual convention.
>
> Let's get ready to pour those 1,000 dollars into the employees' fund. Let's push out our chests and make ready to wear that gold medal on them.

Wage Arbitration on in Providence

A board of arbitration is hearing the controversy between the United Electric Railways, Providence, R. I., and the union employees relative to wages and working conditions. Arthur Sturgis, statistician for the local street car men's union, testified on March 31 that the wages in Providence should be from 65 cents an hour to 70 cents an hour instead of the present 61-cent scale. He contended that wages in 1925 should be determined by the difference in cost of living between 1918 and 1925. James H. Vahey, counsel for the union, suggested limiting the testimony to three days. Both the company and the union have been preparing their cases since the agreement to arbitrate was signed on Feb. 5. The arbitrators include James H. Higgins, chosen by the union; Frank H. Swan, chosen by the company, and Prof. James P. Adams of Brown University chairman. The questions before the board include increase in wages, change in basic working day and abolishment of seniority.

Memphis Men Accept Existing Scale

Union employees of the Memphis Street Railway, Memphis, Tenn., have voted to abandon a 9-cent wage increase demand and stand by the existing wage scale. This action on the part of the employees automatically killed the company's demand for a 12-cent-an-hour decrease in the men's pay. The affairs of adjustment had been placed in the hands of Mayor Paine, who had been assured by railway officials that if the men would withdraw their demands for an increase the company would give up its stand for a decrease. A new contract will be drawn up effective April 1. The trainmen's wages are 45 cents an hour for the men who have been employed for one year or less, 50 cents an hour for men employed between one and two years and 55 cents an hour for men whose service extends beyond the two-year period.

Court Approves Service Changes

With the approval of the recommendations of George H. Clifford of Fort Worth for the rehabilitation of the Oklahoma Railway, Oklahoma City, Okla., by increased and improved service, given recently by John H. Cotteral, United States Judge, all preliminaries to a complete tryout of the Clifford plan have been approved. The court holds that contracts entered into by the railway requiring that the terminal station be maintained are binding, but that it is not required that all cars operate through the station. Under this ruling the receivers plan to reroute cars, which, by not passing through the station, can contribute most to the economy program. The plan contemplates more frequent service on numerous lines and the installation of bus lines to provide cross-town service and reach certain sections not now served. The feeling among citizens generally is that a few months will see the local railway restored.

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Recent Bus Developments

Many Items of Interest Reflecting the Increased Use of the Bus by the Electric Railways—Several Important Purchases—More Motor Lines in Detroit

OFFICIALS of the Duluth Street Railway, Duluth, Minn., announce the purchase of the interstate buses operating between Duluth and Superior. The purchaser is the Duluth-Superior Coach Company, a subsidiary of the railway. The buses were bought from the Northland Transportation Company, Duluth, which purchased them from the Superior White Company during the previous week. The Ashland line, also purchased by the Northland Transportation Company from the Superior White Company at the same time, was not involved in the sale to the Duluth Street Railway.

O. S. Caeser, an official of the Duluth-Superior Coach Company, recently stated that the purpose of the purchase was to provide a reliable and extra special through service between the cities of Duluth and Superior. He said that no local passengers would be carried in either city and that the present cash fare of 25 cents on the buses would not be increased; that present buses would be replaced as soon as possible with modern parlor car type coaches and a de luxe service would be maintained between the two cities.

Herbert Warren, vice-president and general manager of the Duluth Street Railway, announced that the purchase of the bus interests by the traction company was another step by the street railway in its policy to meet fully the needs of Duluth and Superior for transportation facilities.

The Atlanta Coach Company, Atlanta, Ga., has been incorporated to take care of the traffic at the Morningside and Virginia Avenues districts of Atlanta, as a supplement to the service rendered by the cars of the Georgia Railway & Power Company. The incorporaters are H. M. Atkinson, P. S. Arkright, C. G. Adsit, W. H. Taylor and F. L. Butler. The line will be owned and operated by the Georgia Railway & Power Company with equipment described elsewhere in this issue.

The Browncroft de luxe bus line, operated by the Rochester Railways Co-ordinate Bus Lines, Inc., subsidiary of the New York State Railways, has reduced its one-way fare from 25 to 15 cents. This line operates Mack-Lang buses of the most improved limousine type. It connects the heart of the city with the exclusive suburban tract of Browncroft. Originally no stops were made between terminals. Recently this was changed so that the buses would take on or discharge passengers anywhere along its route on signal. In departing somewhat from its original plan, the company expects by the reduction in fare to increase the value of the lines as a revenue producer.

Ernest Stenger, receiver of the Denver Tramway, Denver, Col., addressed the Colorado Engineering Council recently, telling why the Bus Transportation Company, a subsidiary of the tramway, was organized. He said:

"I don't know of any other way to avoid stagnation. The greatest danger of public regulation is stagnation. Don't kill initiative. The greatest advantage of buses for transportation is the elasticity they permit as against rail lines. For use as extensions and feeders to the railway lines, buses have the advantage of representing a smaller original outlay and permit easy adjustment to conditions, despite the fact that the cost per seat-mile is virtually double that of the electrically operated street car.

"It is inconceivable, however, that buses could supplant the rail street cars in the congested parts of the city. The buses cannot handle mass transportation as easily and quickly as the street car. In rush hours it would be virtually impossible to handle the crowds with buses, under present conditions."

It was felt by the tramway that bus transportation had developed to such a point that in order to fulfill its duties the tramway should conduct an experiment in bus transportation.

Four separate bus lines to serve summer cottagers along Lake Ontario are embraced in the program of the New York State Railways, announced by James F. Hamilton, president of the company. Three of the lines will connect Rochester with Island Cottage, Grand View Beach and Manitou Beach and the fourth will serve the Irondequoit territory on the eastern side of the city. Applications have been filed with the town officials along the routes and, if granted, service will start by Memorial Day. The Manitou Beach line will provide transportation for cottagers, without facilities since the abandonment of the Rochester & Manitou Beach (electric) Railroad. This proposed route parallels the Ridge Road Bus line, an independent. The Lakeshore Transportation Company, represented by James J. Dadd, has filed petitions for service similar to that asked in the railways' application. No action has been taken on the independent proposal.

The Detroit Department of Street Railways has expanded its bus operation with the addition of two new bus lines, service being extended on Grand River Avenue for a distance of about 3 miles, and another line having been started on Fenkell Avenue. If traffic warrants the new Fenkell line will be so connected as to give a through route from Grand River Avenue to Highland Park. Buses will be run on a ten-minute headway on the Grand River Avenue line with a five-minute schedule during rush hours. If the service does not prove satisfactory to residents the city may negotiate with the Detroit United Railway for the purchase of the company's Grand River Avenue car tracks to Mill Road. It was the intention of the D. U. R. gradually to decrease service and ultimately establish its terminals at Farmington and Redford, if the D. S. R. took over service on Grand River Avenue to Mill Road. The proposed arrangement with the D. U. R. was interrupted when it went into receivership. The D. S. R. officials want to compare the two services. The extensions are in line with the survey reviewed in the ELECTRIC RAILWAY JOURNAL for Jan. 24, page 129.

Governor Smith of New York on April 7 vetoed the Thayer bill which would have brought freight-carrying buses under supervision of the Public Service Commission as common carries and the Clayton bill amending the transportation corporation law providing that stage corporations in all cities shall be deemed common carriers. In vetoing the latter measure the Governor said: "At the present time litigation is pending on the question of the power of the city of New York, under the enabling act construing the home rule amendment to the Constitution, to supersede Sec. 24 of the transportation corporation law. I cannot escape the conclusion that the approval of this bill would operate to defeat the city in its purpose to supersede this section should the courts decide in its favor."

The Wisconsin Power & Light Company, Oshkosh, Wis., has announced the purchase of the business and equipment of the Interurban Rapid Transit Company and the Gallagher Transportation Company, which has been furnishing bus service between Madison and Stevens Point; also the Schlegler Transportation Company, which has been supplying service between Portage and Madison. New equipment will be added to these lines in accordance with the company's policy of providing frequent and dependable bus service.

The Twin City Motor Bus Company, Minneapolis, Minn., has bought land in White Bear, a St. Paul lake suburb, on which to build a bus depot. The Twin City Rapid Transit Company owns the bus line.

The Roanoke Railway & Electric Company, Roanoke, Va., through its subsidiary, the Roanoke Rapid Transit Company, recently began a bus service between Salem and Roanoke. Each bus seats seventeen passengers. The purpose of the company is to provide a form of intercity transportation similar to the private automobile.

Announcement was made recently that the Interstate Public Service Company, operating between Louisville and Indianapolis, had closed a deal with A. G. Harmon, Indianapolis, whereby it acquires all property, franchise and good will of the Jackson Highway Bus Line, known as the J. & H. Bus Line. The bus line was established about four years ago and operates between various points from Indianapolis to Jeffersonville, Ind., opposite Louisville, on the Ohio River. The two companies had been operating competing bus lines over these routes. In the deal the Interstate gets thirteen buses that were in operation, and five de luxe buses, purchased but not delivered. A. G. Harmon becomes associated with the motor bus department of the Interstate. For the present both lines will be continued.

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News Notes

More Token Carriers Offered. — The Johnstown Traction Company, Johnstown, Pa., through Lee T. Shannon, general manager, has announced the sale of 5,000 token holders offered patrons recently. Another consignment of 5,000 of the carriers are available on the cars or at the company's offices. For $1 conductors will sell patrons a token carrier and thirteen car checks, making the price of the carrier 2½ cents.

Will Maintain Normal Schedules.— Sufficient equipment was saved from the recent fire which destroyed its carhouse, containing eight cars and all the machine shop tools, of the Southern New York Railway, Oneonta, N. Y., to permit the operation of normal summer schedules. The company has no definite plans at this time as to the construction of the shops at the old location or to the purchase of additional equipment.

Suggests Public Vote on Transportation.—The city of Spartanburg, S. C., cannot proceed with its paving program until some decision is made as to whether the car tracks not in use in various sections of the city are to remain or be removed entirely. The board of directors of the Spartanburg Chamber of Commerce will recommend to the City Council that the Freeholders of the city at the general election on May 12 vote whether or not they prefer street car transportation or bus service. This brings up the question in Spartanburg which has remained unsolved now for about two years. At the present time buses are operating on all the main thoroughfares and one street car line is in operation on East Main and Pine Streets connecting with the Glendale and Clifton line. Recently the South Carolina Gas & Electric Company became a Barstow property. The franchise of the company provides for railway service.

Parley on Wages Set.—Representatives of the employees of the New York State Railways will meet on April 20 with officials of the company in the first conference over the wage and working contract for the year beginning on May 1. The opening parley will be held in the Rochester offices of the traction company. The workers on the Rochester, Syracuse and Utica lines of the company have asked for a 7-cent pay increase and the company has countered with a demand for a 5-cent decrease, as told in the April 11 issue of the ELECTRIC RAILWAY JOURNAL, page 594. Several clauses in regard to overtime and working conditions are at issue also.

East St. Louis Ordinance Defeated.— The voters of East St. Louis, Ill., by a majority of 600 on April 7 defeated the franchise ordinance granting the East St. Louis & Suburban Railway and its subsidiary, the Alton, Granite City and St. Louis Traction Company, a new franchise which would have exempted it from paying for street paving between its tracks on North Seventh Street and taxing it on the average number of cars operated during a 24-hour test period. In return for the franchise the company agreed to carry out certain work, including the removal of part of its elevated structure.

Rockford Company After New Grant. —A. D. Mackie, vice-president and general manager of the Illinois Power Company, Springfield, Ill., is giving part of his time to affairs in Rockford, where he will open a new campaign to secure a twenty-year franchise right for the Rockford Traction Company. Rehabilitation of the Rockford Traction will follow upon the formality of another referendum which will give it franchise rights. Citizens are now urging that the Council act so that another vote will not be necessary. It will be recalled that at the election on April 7 a proposal was defeated which had for its purpose the construction of a new system in the city to replace the present lines.

Maps Available for Passengers.— Pocket maps showing all routes and stations of the subway and elevated lines of the Interborough Rapid Transit Company, New York, N. Y., may now be obtained by passengers upon application to the station agents, according to information given out recently by Frank Hedley, president. On the back of the map are schedules showing distances and running time between stations. The actual running time, considering the number of station stops and distance covered, is shown to be practically the same on the elevated as on the subway, and the time saved by changing from local to express amounts to only a very few minutes at the best. The map shows routes of the subway division in red and elevated lines in blue, while sections jointly operated are indicated in red and blue.

Carriers for Patrons' Convenience.— The Arkansas Central Power Company, Little Rock, Ark., is offering a car fare carrier with twelve full fare tokens for 75 cents. Without the tokens the carrier sells for 10 cents.

Vacation Opportunities Stressed.— The Clinton, Davenport & Muscatine Railway, Davenport, Iowa, recently issued its spring and summer time-table in a folder which opened into a 12-in. x 12-in. placard advising its readers to "Ship by Traction," scheduling the advantages of the interurban shipping service and concluding with a few hundred words of the vacation opportunities along the interurban. The folder was lined with illustrations of shipments and pastiming to bear out the text.

Motormen Will Receive Accident Savings.—The sum of $9,650 will be distributed among the motormen of the Memphis Street Railway, Memphis, Tenn., on April 22. This represents the amount of savings effected during the past three months in the reduction of accident costs. The plan was started on June 1, 1923. The savings represent 2.92 cents an hour for each man sharing, and individuals will receive from $16 to $25, dependent upon the number of hours worked within the three months.

Safety Plan Reported Successful.— The safety savings plan adopted by the Des Moines City Railway, Des Moines, Iowa, has proved successful after six months of operation. Accidents have been reduced. Under the plan $4,550 was saved the first six months of its trial. Of this amount $3,000 is to be distributed among trainmen and $1,550 is to go into the savings relief fund for the benefit of trainmen.

Seeks Paving Relief.—Officials of the Princeton Power Company recently asked the city for relief from further paving obligations in Bluefield, W. Va. H. E. DeJarnette, vice-president of the company, pointed out that since the Princeton Power Company purchased the street railway system in the two Bluefields in 1920 it had invested more than $532,000 for improvements. He said the company this year had obligations of $192,000 in addition to operating expenses. East Princeton Avenue is slated for repaving from Lee Street east to the corporate limits this year. That brought the matter to a head. Final action was deferred, but an agreement incorporating the various angles of the proposition was ordered drafted to be submitted to the directors.

Smoking Prohibited.—An ordinance prohibiting smoking on street cars in Sioux City, Iowa, was recently passed by the City Council. Various women's organizations advocated the law.

Fares Increased. — The round trip fares for the Niagara Scenic Belt Line trip between Buffalo and Niagara Falls, N. Y., have been increased 10 cents per capita, with the approval of the Public Service Commission. The new fares are $2.40 for adults and $1.90 for children. The amended tariff becomes effective on May 6.

One-Man Cars in Service. — The Phillipsburg Transit Company has installed one-man cars on its lines in Phillipsburg, N. J. The company has been operating one-man cars on its Easton, Pa., division for some time.

Lower Fares Likely.—Reduction of fares on the Seattle Municipal Railway, Seattle, Wash., is a probability if citizens of Seattle will make more general use of its service, Superintendent D. W. Henderson declared recently in a letter to Councilman W. T. Campbell, who is advocating an advertising campaign in behalf of the car lines for the purpose of increasing patronage. The City Council utilities committee has already tentatively approved the plan. Superintendent Henderson presented a tentative advertising program covering a period of six months, proposing an expenditure of $17,000, of which $10,000 would be for newspaper and $7,000 for billboard publicity. Superintendent Henderson pointed out that the street railway is suffering keenly from competition with the private automobile, particularly from the practice of car owners picking up people for free rides. Patronage of the car lines has been gradually dropping off. In January, 1925, there were 1,000 fewer passengers a day than during the month of January, 1924.

Trucking Service Arranged. — The Rochester & Syracuse Railroad, Syracuse, N. Y., has arranged with local trucking concerns in Rochester and Syracuse to start a "pick-up and store-door delivery service" within the city limits of those two places.

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Foreign News

The First Electrified Line in India Opened

The first electrified railway in India was opened on Feb. 3 on the Harbour branch of the Great Indian Peninsula Railway of Bombay. While this line is only about 10 miles long, it forms part of a general scheme for the electrification of the suburban lines from Bombay to Kalyan, a distance of about 40 miles, by the end of 1926. After the work to Kalyan is completed, the G. I. P. railway will take up the scheme of electrification to Igatpuri on the north. Suburban passenger traffic has been growing rapidly, due to development of the suburban areas for residential purposes, and it was thought that the steam service could not cope with the increased traffic.

Power is furnished by the Hydro-Electric Power Supply Company and is transmitted as 22,000-volt, three-phase a.c. and coverted to 1,500-volt d.c. by means of rotary converters in substations located at suitable intervals along the track. The overhead single catenary system has been adopted, the contact wires being carried on steel structures about 220 ft. apart. The return current is along the track rails through special copper bonds at rail joints.

The train unit consists of three trailers and one motor coach. The two end coaches are equipped with driving control and the unit can be operated from either end. The coaches are 68 ft. long, 12 ft. wide and are constructed entirely of steel with fireproof flooring. The carriages are fitted with automatic M.C.B. couplers and the standard A.V. brakes, as used on all Indian railways. Each motor coach is equipped with four 275-hp., 1,500-volt motors with a maximum speed of 50 m.p.h.

Automatic Route Guide

An apparatus which automatically points out the position of the car at any moment has recently been installed on about 150 cars of the Metropolitan Electric Tramways in North London and Middlesex, England.

A frame about 6 ft. long and 1 ft. wide is mounted above the window on each side of the car. This frame contains a moving chart which winds from one spool to another on the same principle as the film in a kodak. The chart is driven by a gearing on an axle of the car and the motion is transmitted to the spool by a flexible shaft, so that the chart moves with the movement of the car.

All stopping places and other important points on the routes are shown on the chart. In the center of the case is a fixed pointer which indicates the position of the car at all times. The chart is so graduated that it moves about 6 ft. for every mile traveled, which enables the passengers to see half a mile of the route traversed and half a mile in advance.

One of the great advantages claimed for this automatic guide is that it enables both passengers and conductors to determine the exact location of the car during the heavy London fogs.

Interurban Electrification Plans for Alsace

A plan for the electrification of various interurban lines in Alsace, hitherto operated by steam, has been presented to the French Chamber of Deputies. The first lines proposed to be electrified will be from Graffenstaden to Markolshein, from Strasbourg to Truchtersheim and Oberhausbergen and Westhoffen. The Strasbourg Street Railway has been granted a franchise for this operation.

Expenditure on these projects will exceed 3,000,000 francs, of which the national government and the communities interested with share the cost to the extent of 1,700,000 francs and the operating company the remainder. The city of Strasbourg actually owns 87 per cent of the invested capital in its street railway company, which amounts to 6,250,000 francs.

A surplus grant of 350,000 francs will be available from the national treasury, owing to various concessions which will be advanced by the national government. In addition the state will renounce all participation in the share of receipts in excess of a certain figure yet to be determined.

British Railway Extends Bus Service

The Lanarkshire Tramways, Lanarkshire, Scotland, recently purchased the Scottish & General Transport Company, a bus company, at Coatbridge and Airdrie. This business is to be developed along with the existing bus services.

The Lanarkshire company is reported to be the only one which has to pay way-leaves for running over the streets. The upkeep of roads has cost the company about £305,000 since it started operations and during the same period it has paid in local rates £124,000, and for way-leaves £54,000. In spite of these expenditures substantial dividends have been paid.

By an act of Parliament obtained in 1908 the Lanarkshire Tramways was authorized to run buses in extension of its tramway services.

Italy to Have New Railway

A project for a new electric railway linking Genoa, Milan and Turin, the three important commercial centers of northern Italy, has been approved by the Italian Ministerial Council. Work will be begun as soon as the project is approved by the Ministry of Public Works, and it is expected that the entire line will be in service by the end of 1928.

An innovation in financing of the road is that 6 per cent is guaranteed on the investment for a period of 60 years, after which time the equipment will revert to the state upon the reimbursement of customs dues on such part of the material and equipment as may have been imported for the length of the concession, including the construction period.

New Law Protects Car Riders.—A new law has been passed in Perth, Scotland, prohibiting vehicles from passing a stationary tram car at regular stopping places. A similar law is in effect in Glasgow, Edinburgh and Aberdeen. Numerous attempts have been made by tramway authorities in England to obtain Parliamentary enactment of a similar power for the safety of tramway passengers, but the government has opposed the proposal.

New Stations on London Railway.—Bids amounting to £231,999 have been accepted by the City & South London Railway for the construction of four stations on the Clapham-Tooting section of the Morden extension of the railway, now under construction. Two of the stations will be entirely below the surface, while the other two will have booking halls at ground level. All will be equipped with escalators.

Must Pay Loss to Strikers.—General Calles, as arbitrator, has sentenced the Mexico City Tramway, owned by Canadian interests, to pay 100,000 pesos for salaries and damages caused to strikers through loss of time when the company refused to recognize the bus union. Payments must be made of 50,000 pesos now and the other 50,000 in lots of 25,000. The company, backed by the motormen's and conductors' unions, defied the strikers, who formed bus drivers' unions, demanding recognition. The company alleged that the bus drivers were only a few, while the motormen's and conductors' unions had more than 4,000 members. These unions were against the bus drivers. After a strike of two weeks President Calles took a hand and demanded that the company immediately recognize the strikers' union. The company acceded to the demand. When the strike was settled the bus drivers demanded payment of salaries for time lost in the strike. President Calles was appointed arbitrator.

Proposed Tramway Extensions in England.—Permission to construct tramway extensions is being sought of Parliament by the tramway authorities in Blackpool, Burnley, Leeds, Liverpool, London and Middlesex.

Manchester Tramway Development.—A report of the work now in hand or which will be begun in the near future on the Manchester Corporation Tramways has been presented to the Council by H. Mattinson, general manager. The total estimated cost of the work is £550,000, of which £250,000 is for trackwork, £150,000 for new cars and £50,000 for a garage.

New Electric Railway in Spain.—An electric tramway 13 miles long was opened in February between Granada and the Sierra Nevada. This line has fourteen tunnels and 21 bridges and opens communications with several villages.

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Financial and Corporate

Trustees Issue Report of Bay State Property

Due especially to depressions in mills and factories, earnings of the Eastern Massachusetts Street Railway, Boston, Mass., fell off $993,343 in 1924 to $9,012,808, or about 10 per cent compared with 1923. This statement was contained in the report of the public trustees of the company for the year ended Dec. 31, 1924.

Interest and income decreased $67,600, due to the necessary disposals of securities to meet maturities and other obligations. Rentals and advertising revenue decreased $22,400 on account of lesser car-miles and cars in operation.

Net reductions were made in general operating expenses aggregating $827,840. The decrease in car-miles savings, in snow and ice expense and carhouse economies reduced the cost of car operation $212,000. A reduction of $199,000 in power cost was due to a combination of lower prices for steam fuel and decrease in car mileage. As a result of systematic improvements made during the past five years, it was possible to reduce the way and structures expense $498,000 without abatement of rehabilitation work or impairment of the physical condition of the property.

Progress on the rehabilitation of track and roadway continued, expenditures for 1924 being $1,006,477 compared with $1,510,182 in 1923. Trackwork representing $255,921 was considered to offset the depreciation to that amount, and additional work of $138,644 was charged to the rehabilitation fund. Modernization of the rolling stock and adherence to the plan of regular overhauling of cars were large factors in cutting down the equipment expense $92,000.

Bus operation was continued on a much larger scale, the total number of miles operated being increased from 395,240 to 869,269. The gross revenues from this source were $194,157, compared with $76,390 in 1923.

During the year insurance payments aggregating $36,200 were made in sixteen death cases, and in addition nine employees are receiving monthly payments under the total disability clause of the insurance policy. Pensions amounting to $18,644 were paid during the year.

The total dividend payments for the year were $719,618. Funded obligations of the company to the amount of $1,581,000 were retired and canceled.

COMBINED INCOME STATEMENT OF ALL OPERATING DISTRICTS, EASTERN MASSACHUSETTS STREET RAILWAY

	1924	1923
Street car revenue	$9,012,808	$10,006,151
Auto bus revenue	194,157	76,390
Freight and other revenue	44,376	46,034
Rentals and advertising	211,323	233,741
Interest and other income	282,837	350,390
Total revenue	$9,745,501	$10,712,706
Expenses:		
Way and structures	$1,313,669	$1,811,203
Equipment	1,303,516	1,395,814
Power	1,021,057	1,219,870
Car operation	2,249,346	2,461,328
Injuries and damages	402,538	365,093
Insurance	94,797	84,810
Law expense	32,497	15,750
Rent of tracks	77,787	68,522
General wages and expenses	240,409	246,322
Pensions and group insurance	82,086	77,405
Stationary and printing	35,059	41,424
Stores and garage expenses	72,553	104,814
Miscellaneous expense	36,972	51,430
Auto bus expense	270,388	116,729
Total operating expense	$7,232,674	$8,060,514
Total operating expenses and taxes	$7,581,444	$8,436,019
Gross income	2,164,057	2,276,687
Interest and rentals	1,362,658	1,398,152
Net income	$801,399	$878,535

Correction in Richey Index of Fares

The Richey monthly index of street railway fares, as published in the fourth issue of this paper each month, has been revised to correct an error which occurred in October, 1924. The result of this revision has been to increase the rate of fare, as shown in the Conspectus, since October. The figures as published and the revised figures, as furnished by Mr. Richey, follow:

Month	Index as Published	Corrected Index
October, 1924	7.15	7.22
November, 1924	7.17	7.24
December, 1924	7.17	7.24
January, 1925	7.17	7.24
February, 1925	7.17	7.24

The figure 7.26 cents, printed in the March index, is correct.

Loss to Stabilizing Fund in Toledo

Commission Says Toledo Could Be Put on a Par with Service-at-Cost Cities Elsewhere—Safety Work Stressed

OPERATIONS of the Community Traction Company, Toledo, Ohio, for the past year as prepared for the City Council, by acting Commissioner E. L. Graumlich, show that $3,390,467 has been expended for maintenance, depreciation and rehabilitation of the property during the three years and eleven months the Milner service-at-cost measure has been in effect. This exceeds the total amount spent in this way in the preceding six years. The report indicates that the most important piece of work accomplished since the beginning of the service-at-cost plan has been the building up of the traction property to operate economically and with comfort, convenience and safety to the car riders.

An income and expense consolidated statement for the period under which the Milner ordinance has been in effect shows the Community Traction Company to have received $13,497,783 in passenger revenue. After the consideration of interest paid on bonds and dividends on preferred stock there was a net profit of $384,862. Against this was charged $934,363 for sinking fund, leaving a deficit of $549,501 in the stabilizing fund. Mr. Graumlich's report concludes with the assurance that the Toledo system could be put on a par with other cities having service-at-cost plans "with renewed industrial activity" and co-operation of the City Council in eliminating unnecessary losses and aiding in carrying out economies that prove to be sound and recommended by the commissioner and company.

The accompanying table shows the operation of the Community Traction Company in 1924 compared with 1923. During the past year $835,925 was spent in maintenance and a large program has been set up for the present year. Economies put into practice reduced operating expenses from $3,286,283 in 1923 to $3,214,053 in 1924. Bus feeder lines caused a loss of $11,446, but indications are some of the older

SUMMARY OF OPERATIONS AT TOLEDO FOR THE YEAR ENDED DEC. 31

			Cents per Car-Mile	
Revenue from transportation:	1924	1923	1924	1923
Passenger revenue	$3,515,692	$3,610,139	49.456	46.699
Special cars	465	932	.....	.....
Miscellaneous	488	689	.....	.....
Total transportation revenue	$3,516,646	$3,611,761	49.470	46.720
Other operating revenue:				
Station and car privileges	21,209	20,399	.....	.....
Rent of equipment	8,277	11,332	.....	.....
Rent of tracks and terminals	233,155	239,433	.....	.....
Total other revenue	$262,642	$271,165	3.695	3.508
Non-operating revenue	15,200	15,930	.214	.206
Gross income	$3,794,490	$3,898,857	53.379	50.434
Expenses:				
Maintenance and repairs	770,000	640,000	10.832	8.279
Operation	2,123,278	2,327,528	29.869	30.108
Depreciation	135,925	132,005	1.912	1.707
Taxes	183,450	181,484	2.581	2.348
Interest floating debt	1,398	5,264	.019	.068
Total expenses	$3,214,053	$3,286,283	45.213	42.510
Net income	$580,436	$612,574	8.166	7.924
Deductions from income:				
Sinking fund	226,543	220,009	3.187	2.846
Bond interest	480,000	460,000	6.752	6.209
Preferred dividends	84,845	62,274	1.194	.805
Total deductions	$791,388	$762,274	11.133	9.860
Stabilizing fund—Deficit	$210,951	$149,700	2.967	1.936

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lines may soon become self-supporting through development of new business. Net loss to the stabilizing fund during 1924 was $210,951, while credits to the city-purchased sinking fund totaled $226,543.

Total passengers carried in 1924 were 55,077,103 compared with 64,719,404 in 1923. Unemployment and higher fares are both declared to be contributing causes to this slump, but ownership and operation of private automobiles and competition of bus lines are said to be the outstanding reasons.

Mr. Graumlich in his report said that the independent bus lines were continuing to divert a large amount of revenue, and this fact within itself had been the chief cause of the higher rates of fare than should obtain in Toledo. He said that an accurate check of these bus lines taken at frequent intervals showed that the company could have operated without a loss during 1924 had these passengers been carried on the street cars.

A feature of the annual report was the reference to reduction of accidents to the public amounting to 27.2 per cent, or from 4,312 in 1923 to 3,130 in 1924. Expense of the claim department was $159,801 in 1924 compared with $189,841 the previous year. The decrease in accidents over the entire system was brought about by a better maintained property, one-man car operation, closer inspection of equipment and main thoroughfare system of regulating traffic in the city.

Number of collisions with automobiles shows a reduction of 22.6 per cent, due largely to better enforcement of the main thoroughfare system which made all streets with car lines main thoroughfares and required automobiles to come to a full stop or under control before crossing streets.

Montreal Financial Structure Being Simplified

A decided step has been taken toward simplifying the position of the Montreal Tramways & Power Company, Ltd., Montreal, Que., which will doubtless lead eventually to its winding up. So said the Montreal *Gazette* in its issue of April 1. This company held in its treasury $7,000,000 of the debenture stock of the tramways company, which it exchanged for new bonds and which have been sold, and the proceeds of this sale and a bank loan of about $2,800,000 were used on April 1 to redeem the $8,000,000 of 6 per cent five-year bonds. This leaves the Montreal Tramways & Power Company holding assets consisting of 21,000 shares of Montreal Tramways, which it has hypothecated to United Securities, Ltd., to secure the loan of $2,800,000.

The *Gazette* says it seems logical that the United Securities will eventually purchase these shares, wiping out the loan as part of the purchase money. Apart from this debt the Montreal Tramways & Power Company has no liabilities, all of these having been wiped out by previous advances from United Securities. Other assets of the Montreal Tramways & Power Company, consisting of shares in the Montreal Hydro-Electric Company, have but a nominal value. The policy of the present management will doubtless call for the elimination of the holding company.

Another feature which gives point to this forecast is that out of the 175,000 shares of Montreal Tramways & Power Company for which preferred and common shares in United Securities were offered in exchange, more than 170,000 shares have already been turned in. The Canadian paper says further:

> The anomaly of having an English registered company operating in Canada as a holding company of Montreal Tramways, and having a capital of more than $17,000,000 par value, will doubtless be dealt with in due course. The confusion which has been present in the affairs of these companies is fast being removed and a clear and clean-cut organization will eventually arise.

Court Action Delays Twin City Settlement

Whether the Minnesota Railroad and Warehouse Commission or the District Court is to have jurisdiction over the St. Paul City Railway will be determined by the Minnesota Supreme Court in an appeal hearing on April 30. If the decision is in favor of the city of St. Paul, the commission will be ousted automatically from control, says Commissioner Ivan Bowen. A law passed at the 1920 Legislature gave the state control through the commission. The St. Paul City Railway has filed a brief in the appeal and the city had twenty days in which to reply. Meanwhile all proceedings to determine the rate of fare in Minneapolis are held up.

The Railroad Commission reported a valuation for the properties of the St. Paul lines and the Minneapolis Street Railway. Immediately St. Paul took the matter into court and the judge ordered the commission to file its valuation. The commission and the railway contended that this was only a step and that until the rate of fare is set there is nothing determined and no order from which to take appeal.

In the railway brief the counsel states that the city of St. Paul is trying to prevent fixing a permanent rate of fare by proceedings that are unwarranted, idle and destructive and an avowed attempt to prevent the commission from performing its duties. It contends that if every step taken by the commission preliminary to fixing the rate is immediately subject to court review the resulting delay will defeat the entire purpose of the legislation. Meanwhile enforced operation by a company at an inadequate rate of return is continued denial of the rights of the company, as each day's delay that entails a loss destroys the company's property. The commission has filed a similar brief declaring St. Paul's action premature.

Meanwhile a bill in the Legislature authorizing the commission to establish a one fare rate in the metropolitan zone, which would include both cities, is meeting with support in St. Paul and strenuous opposition from Minneapolis before the committee of the Legislature. A bill has been introduced also which would restore the one fare rate into St. Paul midway from Minneapolis. This was abolished when the commission took over the railway jurisdiction.

Kansas City-Clay County Line Gross Revenue Falls Off

Net earnings from operation of the Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., for the year ended Dec. 31, 1924, fell below those of the year previous. After all expenses, including interest on bonds and dividends on preferred stock, there remained $44,600 for depreciation and $24,139 for a net surplus. Of the gross revenue 15⅔ per cent was expended for maintenance. In 1924, 1,827,521 passengers were carried, against 2,453,339 in 1923. These facts are contained in the annual report for the fiscal year ended Dec. 31, 1924.

The company gives three primary reasons for the decline in gross revenue: First, the general depression of business in that section of the country; second, the completion of the hard-surfaced highway parallel with the electric railway between Kansas City and Excelsior Springs, followed by an increase in the number of privately owned automobiles, and, third, the rapid development in the operation of commercial buses and trucks throughout the year.

The report says that the encroachment of the motor coach service on the Excelsior Springs division was watched by the staff of the company and on Aug. 7, 1924, the Kansas City, Clay County & St. Joseph Auto Transit Company, organized by interests representing stockholders of the company, began motor coach operation between Kansas City and Excelsior Springs, and on Dec. 3, 1924, a coach line was established along the St. Joseph division

SUMMARY OF RESULTS FROM OPERATION OF THE KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY

	1924	1923
Railway operating revenue		
Transportation revenue, St. Joseph division	$692,929	$755,190
Transportation revenue, Excelsior Springs division	277,130	466,525
	$970,060	$1,221,716
Other operating revenue, St. Joseph division	5,665	6,333
Other operating revenue, Excelsior Springs division	2,154	6,991
	$7,820	$13,324
Total operating revenue	$977,880	$1,235,041
Railway operating expense:		
Way and structures	$85,569	$107,070
Equipment	61,866	85,695
Power	114,906	129,812
Conducting transportation	211,144	228,032
Traffic	10,157	7,966
General and miscellaneous	128,887	157,354
*Depreciation	44,645	100,060
Taxes (except income taxes)	29,837	29,094
Total	$687,014	$845,087
Operating income	$290,866	$389,953
Non-operating income:		
Interest funded securities	5,105	2,490
Inerest unfunded securities	6,328	5,547
Total	$11,433	$8,038
Gross income	$302,299	$397,992
Deductions from gross income:		
Interest	$161,402	$161,450
Miscellaneous	3,257	
Total	$164,659	$161,450
Net income	$137,639	$236,542
Less estimated income taxes	5,000	24,892
Balance available for surplus and dividends	$132,639	$211,649

*The auditors have taken accrued depreciation less expenditures for renewals and replacements, $42,085 as an appropriation of surplus—add that amount and minor adjustments of $137 to check their surplus net income of $174,862.

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between Kansas City and Trimble via Smithville, 26 miles. On Jan. 20, 1925, the company began the operation of an auto service to complete the distance between Kansas City and St. Joseph. In this way both divisions have auto service furnished in the interest of the electric railway.

During the year the gross revenue from freight was $153,791, with gross tons 48,789. In 1923 the gross revenue from freight and the gross tons were $194,988 and 96,352 respectively. The 1924 figure does not include revenue from "electric express," which was put in operation in March, 1924, for handling package freight. This business has grown substantially and more than 900,000 lb. of freight was handled with gross revenue of $4,740 from March 17 until the end of the year.

During 1924 only $5,573 was expended by the claim department for accidents. The amount expended during 1924 for accidents occurring previous to 1924 was $5,521.

The accompanying tables show the results of operation of 1924 and 1923 and some operating statistics for 1924.

Dividends on Common Expected in Louisville

Railway Effects Economies in Operation—Report Scores Jitney Competition and Predicts Higher Fare in 1926—Review of Operation of Bus Subsidiary

THE result of 1924 operation by the Louisville Railway, Louisville, Ky., was a net withdrawal from the barometer fund of $67,393. This was disclosed in the annual report of the president to the stockholders of the company at the annual meeting. The year 1924 was the second year of operation under the new operating ordinance, which became effective on Sept. 13, 1922. In 1924 the balance available for dividends was $535,394, compared with $36,253 in 1920, an improvement in four years of $499,140, while the condition of the physical property improved continuously.

The year 1924 shows the largest balance available for dividends of any year since the war and the improvement since 1920 has been continuous except for a small setback in 1923, the first year of operation under ordinance No. 330, when the revenue for transportation showed a decrease of $102,679 from that of the preceding year and the balance available for dividends was $15,437 less than the preceding year.

In 1924 the revenue from transportation was $8,457 less than in 1923, but the balance available for dividends was $45,852 more than in that year. This improvement was brought about by economies effected during the year. Safety and co-operative association work during 1924 cost about $19,000, but there was a net reduction in accident expenditures of $30,000 compared with the previous year and $87,213 compared with 1920.

In 1921 the operating expenses were $3,273,000 and in 1924 $2,995,000. This means that in 1924 the public was served by the company at a cost of $278,000 less than in 1921 in spite of the fact that in the year 1924 11,662,247 car-miles were operated, compared with 10,834,921 car-miles in 1921. An analysis of the $278,000 saving in complete detail shows that safety work accomplished approximately $87,000 per year, economy in power generation about $100,000 and economy in operation about $50,000.

The year's program of repair and upkeep was a heavy one. The running repairs called for replacements of 26,540 ties, 266 poles and 27,353 lb. of trolley wire and during the same period the interurban lines required 26,639 ties and 224 poles and 2,434 lb. of trolley wire. The program for power economies outlined in the report for 1923 was completed in 1924. The last six months of 1924 showed a saving for power of slightly more than $50,000 over the corresponding period of 1923.

The cars purchased under the series "B" car trust reported last year were placed in service on March 9, 1924, and have added greatly to the comfort and convenience of the service. During the year track reconstruction included the rebuilding of 4.53 miles of track in paved streets at a cost of $169,076 and the installation of new special work at nine locations to improve operations at a cost of $28,479.

One hundred and thirty-six employees of the company, including the Kentucky Carriers, Inc., ran without an accident during 1924 and twelve of them had no accident in three years.

The Co-operative Association had a most successful year. It paid out during 1924 $12,769 in sick benefits and $3,925 in death benefits and had on hand on Dec. 31, 1924, a surplus of $68,066, of which $63,183 was invested.

The Kentucky Carriers, Inc., was organized in June, 1923, with $101,500 capital paid in by the Louisville Railway. No profit from early operation was expected, as it was rather the plan to offer the most up-to-date transportation system in Louisville, looking to the future to justify by financial return this policy of assisting in the upbuilding of the city. The first 18 months' operation of the Kentucky Carriers, Inc., was a net loss, but in December, 1924, the tide seemed to turn, and since that time coach operation has been doing better.

More recent reports indicate during January, 1925, an excess of approximately 1 cent per bus-mile over the cost of operation. Receipts during the first three months were 10 cents per bus-mile. At the end of the first year they were 15 cents per bus-mile. During December, 1924, receipts were more than 20 cents per bus-mile and for January, 1925, reached 21.4 cents. The cost of operation averaged 20.43 cents per bus-mile. This is divided into 9.91 cents for maintenance, including depreciation; 8.5 cents for conducting transportation (including bus operators' salaries), and 0.3 cent per bus-mile for taxes (state license, city license, jitney and taxicab license, and also drivers' license).

Increase in receipts is attributed to the fact that the public is becoming accustomed to the service rendered. The original policy of providing a seat for every passenger at a 10-cent fare has been abandoned and standees are being carried. During the rush hours, the average load is 35, which means that ten passengers have to stand for at least a portion of the trip.

Bus service in Louisville was started in June, 1923, when twelve White Model 50 buses with 25-passenger bodies were installed on a 3-mile route. The length of route was subsequently extended to 5½ miles, and then a second line was put into operation. This latter proved unsuccessful and was abandoned. Attention was concentrated on the original route in an endeavor to make it financially successful. Changes in headways and length of runs were made until the service suited the requirements in the exclusive residential section served by the line.

The buses are operated on streets entirely free of car lines except in the downtown business district. Under existing conditions operations are being carried out on the basis of 484,000 bus-miles per accident.

The report refers to the jitney service and says that if it were eliminated not only would the safety of traffic on the streets be improved and congestion largely eliminated but the additional transportation revenue accruing to the street cars would amount to something more than $100,000 a year. The attention of the city officials has been frequently called to the fact that an increase of $100,000 in transportation revenue would be sufficient under present operating conditions to build up the barometer fund and justify the hope that the rate of fare might eventually be decreased. The present tendency of operation, according to the report, is resulting each year in a withdrawal of the barometer fund. Although the 1924 withdrawal was smaller than that for 1923, there is no promise of a decrease in fare but rather to an increase in 1926.

Funds received month by month from

COMPARATIVE INCOME STATEMENT OF LOUISVILLE RAILWAY

	1924	1923
Operating revenues:		
Revenue from transportation	$4,247,314	$4,255,771
Other operating revenues...	202,364	190,094
Total operating revenues.	4,449,678	4,445,866
Operating expenses.....	2,995,972	3,078,522
Net revenue from operations	$1,453,706	$1,367,344
Taxes.....	401,000	396,000
Operating income.....	$1,052,706	$971,344
Non-operating income:		
Louisville & Interurban Railway—net income....	$126,365	$127,256
Other non-operating income	12,165	37.816
Total non-operating income	$138,530	$165,072
Gross income.....	$1,191,237	$1,136,416
Deduction from gross income:		
Interest on bonds and notes	$651,750	$645,819
Miscellaneous debits.....	4,093	1,055
Total deductions.....	$655,843	$646,874
Balance available for dividends on stocks.....	$535,393	$489,542

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the barometer fund have been sufficient to pay during 1924 the deferred dividends on preferred stock due in 1921, 1922 and 1923 and on Feb. 15, 1925, the 1924 dividends were paid, so that for the first time since 1918 the company stands in a position of having to meet only current preferred dividends. Mr. Barnes says that during 1925 withdrawals from the barometer fund applicable to common stock will accrue and by the end of the year the company expects to be in a position to consider a dividend on common stock.

$2,750,000 Put Back Into Denver Tramway Without Financing

Edwin M. Bosworth & Company, Denver, Col., have prepared an analysis of the operations of the Denver Tramway, especially with reference to the first and refunding sinking fund 5 per cent mortgage of 1923, in which it is shown that since the receiver was appointed in December, 1920, to the present time, a four-year period, the earnings have averaged more than $200,000 a year, after payment of taxes and fixed charges on all of the $17,500,000 funded debt outstanding. Upon a similar basis, the earnings for the first ten months of 1924 were $196,000, compared with $155,000 for the same period of 1923.

Improvements and renewals costing approximately $2,750,000 have been made during the receivership, without the necessity of issuing any obligations by the receiver. This amount expended for improvements is almost identical with the interest which has been defaulted on the following issues:

	Oustanding	Annual Interest
Denver City Tramway first and refunding sinking fund 5s of 1933	$10,107,750	$505,388
Denver & Northwestern first and collateral of 1932	278,100	13,905
Denver Tramway collateral 7 per cent notes of 1922	2,498,000	174,850
Total	$12,883,850	$694,143

On the first item above the interest has been in default since Nov. 1, 1920. In fact, it was this default that led directly to the receivership. Therefore, to each $1,000 bond of this issue is attached past due coupons of a face value of $225.

This $10,107,750 refunding and sinking fund lien of 1933 is a direct obligation of the Denver Tramway. It is secured by a mortgage on all its property, franchises, etc., now owned or hereafter acquired, including the entire railway system of the city of Denver, consisting of 203 miles of track, subject to the underlying bonds.

The company is operated as one system with the Denver & Northwestern Railway, which owns 26 miles of railway between Denver and neighboring towns. The present mileage of the system thus aggregates 229.

These bonds are also secured by the pledge of $2,670,000 of a total issue of $3,837,000 Denver Consolidated Tramway first consolidated 5s of 1933. The analysis of the company says:

> The decision of the federal court in December, 1924, establishes the value of the property at a figure approximately $6,000,000 greater than the total funded debt of the company and establishes the contention of the company that rights to the use of streets granted in 1885 and 1888 are perpetual. It also sustains the position of the company in its refusal to decrease the present 8-cent fare.
>
> It is believed by well informed persons that the decision paves the way for reorganization. This will probably result in a scaling down of the total funded debt of the company by from 20 per cent to 30 per cent and a scaling down of the sinking fund bonds of 1933 by from 25 per cent to 50 per cent, the remaining 25 per cent to 50 per cent, together with the defaulted interest, to be compensated by preferred stock.

Loss in Traffic on Connecticut Company's Lines

The report of the 53d year of the New York, New Haven & Hartford Railroad states that due to the very material decrease in industrial activity in the territory served by the Connecticut Company there was a decrease in patronage of the cars throughout the year. An increase in the token rate of fare from two tokens for 15 cents to three tokens for 25 cents, effective Feb. 10, 1924, and economies in operation offset in part the effect of the loss in patronage on the net revenue. On the New York, Westchester & Boston Railway there was an increase of 509,401 in passengers carried during the year. A new terminal facility at Harlem River was opened during the year providing more convenient and quicker transfer from the New York, Westchester & Boston Railway to the Interborough system. An extension from Larchmont to Mamaroneck has been authorized.

The accompanying table shows the income accounts of the electric railway properties of the New York, New Haven & Hartford Railroad during the year 1924 compared with the previous year.

Georgia Property Sold

The Gainesville Railway, Gainesville, Ga., was sold on April 7 for $8,200 at public auction to satisfy a paving assessment of that amount levied by the city. T. E. Atkins, president of the state banking company of Gainesville, bought in the road for the amount of the assessment. He acted for J. H. Reynolds, a client of the bank, and stated that the road would be sold for junk in the near future. There were no other bidders.

The railway covered about 10 miles of street. Inroads by private automobiles destroyed its ability to show a profit and for several years it was operated at a loss.

The establishment of jitney lines further incapacitated the company, and when the city of Gainesville recently issued a paving assessment of more than $8,000 against it, directors of the company agreed to let the road go. It suspended operation on April 4.

Bakersfield & Kern Property Included in Sale

The controlling syndicate of the San Joaquin Light & Power Corporation, Fresno, Cal., recently sold that company, the Midland Counties Public Service Corporation and the Bakersfield & Kern Electric Railway to the Western Power Corporation of New York. Since that time A. G. Wishon has been made president; A. Emory Wishon, vice-president and general manager; A. C. Balch of Los Angeles is still vice-president; B. R. Meyer of Los Angeles is also one of the vice-presidents; W. E. Durfey is secretary, Ernst E. Behr, treasurer and comp-

	Connecticut Company Year 1924	Connecticut Company Comparison with 1923 Increase or *Decrease*	New York, Westchester & Boston Railway Year 1924	New York, Westchester & Boston Railway Comparison with 1923 Increase or *Decrease*	Berkshire Street Railway Year 1924	Berkshire Street Railway Comparison with 1923 Increase or *Decrease*	New York & Stamford Railway Year 1924	New York & Stamford Railway Comparison with 1923 Increase or *Decrease*	Westchester Street Railroad¶ Year 1924	Westchester Street Railroad¶ Comparison with 1923 Increase or *Decrease*
Total operating revenues	$14,374,838	*$342,394*	$1,521,446	$68,503	$928,578	*$56,565*	$513,807	*$11,805*	$216,648	*$6,353*
Total operating expenses	11,590,736	*32,717*	993,196	24,545	774,069	*108,939*	394,151	*29,897*	209,755	*6,749*
Net operating revenue	$2,784,102	*$259,676*	$528,249	$43,957	$154,508	$52,373	$119,655	$18,092	$6,892	$395
Tax accruals	588,456	11,783	210,016	8,554	39,138	*5,144*	24,696	*273*	12,659	*43*
Operating income	$2,195,645	*$271,460*	$318,233	$35,403	$115,370	$57,518	$94,959	$18,365	†5,766	439
Non-operating income	50,433	*12,184*	10,627	4,696	1,777	*1,486*	3,806	3,273	1,175	*66*
Gross income	$2,246,079	*$283,645*	$328,861	$40,100	$117,147	$56,031	$98,765	$21,638	†4,590	†$383
Deductions from gross income	1,543,611	39,133	*1,963,789	58,314	‡294,982	*5,690*	§112.055	1,776	‖33,436	1674
Net income	$702,468	*$322,778*	†$1,634,928	*$18,214*	†$177,834	$59,722	†$13,289	$9,861	†$38,027	*$291*

*Deductions from gross income include $1,042,335 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

†Deficit.

‡Deductions from gross income include $209,980 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

§Deductions from gross income include $40,225 interest accruing to the New York, New Haven & Hartford Railroad, but not included in the income account of that company.

‖Deductions from gross income include $26,858 interest accruing to the New York, New Haven & Hartford Railroad but not included in the income account of that company.

¶The Westchester Street Railroad is entirely separate from the New York, Westchester & Boston Railway. The operating expenses were 96.82 per cent of the total operating revenues, a decrease of 0.27 per cent as compared with the year 1923. Road in the hands of receiver from Feb. 29, 1920—receiver's account included.

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troller, and Murray Bourne general counsel. The principal place of business is now Fresno instead of Los Angeles.

Providence Traffic Off

Loss of $405,231 Sustained in 1924 Despite Economies—Industrial Conditions Adverse

Due to a gradual and continued slowing down of industry until a serious condition of unemployment prevailed, not only in the textile industry in Rhode Island but also in many other industries, riding on the lines of the United Electric Railways, Providence, R. I., decreased to such an extent that it was necessary to curtail service, reduce forces and substitute bus operation for trolley service on light-riding suburban lines. Figures of passengers carried reflect accurately the extent of this depression. Whereas in 1923 there were 138,578,286 revenue passengers on the cars and buses of the system in 1924 there were 114,385,566, or 24,192,720 fewer than in 1923, the best year in the company's operation. Notwithstanding the economies put into effect by the company and an increase in the rate of fare effective May 27, 1924, there was a deficit of $405,230 for 1924.

CONDENSED INCOME AND SURPLUS ACCOUNT, UNITED ELECTRIC RAILWAYS, PROVIDENCE, R. I., YEAR ENDED DEC. 31, 1924

Total revenue from all sources		$8,196,694
Operating expenses	$6,660,236	
Depreciation and equalization reserves	861,699	
Taxes	336,570	
Bond interest and other deductions from income	696,909	8,555,415
Net loss from operations for the year		$358,720
Add: Miscellaneous adjustments		46,510
Deducted from surplus		$405,230
Surplus account:		
Balance Jan. 1, 1924, per Ernst & Ernst report		$1,465,690
		$1,060,459
Add: Donations and claims	$13,111	
Less: Adjustments for property retired	1,801	11,309
Surplus Dec. 31, 1924		$1,071,768

Among the economies in operation the report states that at the close of 1923, 28 of the company's 60 trolley lines were under one-man operation and 43 lines were under one-man operation on Dec. 31, 1924. Another economy, the reduction in the number of employees, was necessary as a result of the increase in the establishment of one-man car lines. The report states that if a lower wage schedule and less arbitrary working conditions had been in effect the company would not have been forced to employ such drastic measures in the reduction of its forces and service and could have offered at least part time employment to many of those who were laid off indefinitely.

In December, 1923, 83,817 bus-miles were operated and in December, 1924, the bus-miles operated exceeded 139,000. Most of the routes established in 1924 were in substitution for unprofitable trolley lines operating from populous into thinly settled suburban territory. These lines even under bus operation do not show a profit, but have substantially reduced losses.

In respect to the policy of replacing trolley lines by bus lines, it is the company's opinion that in some cases buses are a satisfactory substitute for nonpaying trolley lines operating into sparsely settled suburban territory, but that the important province of the bus really is as a supplement to the railway. Rather than discontinue trolley lines in suburban territories and leave a community without any public transportation facilities, the company replaced some suburban trolley lines with bus lines, and has, by so doing, either been able to make these lines meet the cost of service or to reduce losses very substantially. The company has also established bus service in communities which heretofore have had no public transportation facilities. These lines connecting with the trolley lines serve as feeders and thus supplement the existing system.

The company explains the negotiations as to labor conditions and states that the outcome will probably be arbitration.

The work of preparing its rate case was completed early in 1924 and on April 26 the company filed with the Public Utilities Commission new tariffs providing for a rate of fare which it was hoped would meet the cost of service, including a 6 per cent return on capital stock. After careful study an 8-cent cash fare with five tickets for 35 cents was decided upon. The new tariff became effective on May 27. But the business depression of 1924 curtailed the volume of traffic carried and this so reduced gross earnings that it was impossible to meet the full cost of service notwithstanding the adoption of operating economies and the increase in the rate of fare.

The income and surplus account for 1924 are shown in the accompanying table.

Investment of Sun Life in Illinois Traction Explained

Additional light has been shed on the interests which the Sun Life Insurance Company of Canada took in the financing of the Illinois Traction Company, succeeded some time ago by the Illinois Power & Light Company. In an article in the *Financial Post* of Canada T. B. Macaulay, president of the Sun Life Insurance Company, is quoted as saying that big profits were made by the Sun Life on its investments in the Montreal Light, Heat & Power Company and in the Illinois Traction Company. He says that in all between $3,000,000 and $4,000,000 was made on its Illinois Traction investment.

The *Post* contains some interesting history on the connection between the Sun Life Insurance Company and the Illinois Traction system. It states that the investment in the Illinois Traction caused criticisf of the Sun Life in some quarters and of Mr. Macaulay himself. It was felt that the Sun Life was unwise in having so large a proportion of its investments in one company, especially in an American company, although at that time the Illinois Traction investment represented a division of risk between companies serving 55 different communities in five different states. These companies were all controlled by the Illinois Traction, but their businesses were varied and covered the field of electric and gas generation to a greater extent than the less profitable field of electric street railway operation. The Illinois Traction group of companies came through the storm of the after-war period successfully. Mr. Macaulay then saw that the time was ripe for the Sun Life to reap a profit on its investments in this group and he sold the holdings. A check for $30,903,881, representing part of the sale price, was given Mr. Macauley.

Mr. Bodine as Public Service Director.—At the annual meeting of the Public Service Corporation of New Jersey Newark, N. J., Samuel T. Bodine was elected a director to succeed Lewis Lillie. Other directors were re-elected.

New Receiver Appointed.—J. P. Ingle, formerly general manager of the Jacksonville Traction Company, Jacksonville, Fla., has suceeded E. J. Triay as receiver of the property. He was appointed by Federal Judge Rydon M. Call.

Seeks Appointment of Receivers.—A suit asking for appointment of a receiver for the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., was filed in Marion County Circuit Court at Indianapolis on April 10. Katherine Shriner of Boston, Mass., is the plaintiff. Phillip McGowan, secretary of the company, declared the suit was a protest move on the part of a small minority of bondholders of the old Indianapolis & Northwestern Traction Company against extension of bonds of the company for a period of ten years. The Indianapolis & Northwestern was absorbed by the Terre Haute, Indianapolis & Eastern Traction Company several years ago. Approximately 90 per cent of the bondholders agreed to the extension, according to Secretary McGowan.

Seeks to Abandon.—The New Jersey Interurban Company, Phillipsburg, N. J., has asked permission of the Board of Public Utility Commissioners to abandon trolley tracks along the route from Phillipsburg through Stewartsville, New Village, Broadway, Washington and Port Colden. The company suffered a loss of $17,000 in 1924, not including depreciation or payment of interest on funded debt. It asks to continue an emergency auto service pending a hearing on April 24 at Washington, N. J. At this time counsel will submit an application for the New Jersey Interurban Coach Company to operate buses over the above route.

Right-of-Way to Be Sold.—A sheriff's sale of all the right-of-way and other property of the Jersey Central Traction Company, which formerly operated an electric railway from Red Bank to Keyport, Monmouth County, N. J., will be held at Freehold, N. J., on April 20 to satisfy a judgment of $19,483. The sale consists of all the right-of-way together with all the rails and ties, all the sidings and the bridges across the Shrewsbury River at Red Bank and over the railroad near Keyport. The sale will also take in any right or claim held by Herman Schlichting, who bought part of the right-of-way with the idea of operating straight gasoline cars over the route.

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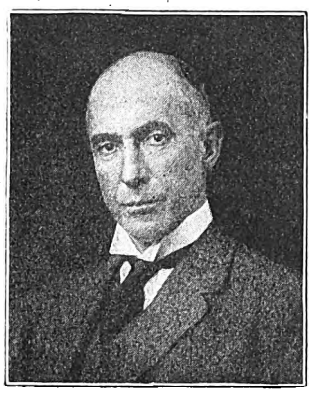
Personal Items

Mr. Black Retires

Head of San Francisco Road Gives Up Active Duties, but Continues with Engineering Firm

Charles N. Black, president of the Market Street Railway, San Francisco, since 1922, has resigned and has been succeeded by Mason B. Starring, New York, president of the United Railways Investment Company, holding company of the San Francisco railway system. Mr. Black will remain a director.

Mr. Black has been connected with the Market Street Railway in various capacities for the last seventeen years. For many years he has been looking forward to the day when he could feel at liberty to relinquish the duties of business and devote the remaining period of his life to pursuits that appealed to his personal taste. The present seemed an opportune time to put this plan into effect.



C. N. Black

The period covered by Mr. Black's connection with the company was an unusually eventful one. It is beyond hope even to attempt to summarize the record of these years. Among the outstanding events, however, were the recovery of the company from the effects of the earthquake and fire and the construction of the first section of the municipal railway as an incident anticipatory of the San Francisco fair. This last-mentioned event brought the private company and the city into direct competition, but under Mr. Black's direction, relations have been established between the company and the municipality which are of the most cordial character. As Mr. Black sees it, there is no reason why this condition should not continue until there is developed a plan for a unified service which the interests of the city imperatively demand.

Sight must not be lost, however, of the fact that the management has been confronted with other unusual operating problems. San Francisco still has a 5-cent fare with a universal transfer, and this in spite of the fact that the cost of everything entering into the operation and maintenance of a street railroad is practically 100 per cent higher than before the World War. The results achieved have been attained only through the most drastic economy and the heartiest co-operation of the officials and other employees.

MR. BLACK A PIONEER

As indicated previously, Mr. Black's latest term of service as an executive of the Market Street Railway dates from July 1, 1922. His connection with the system there dates back to 1907, when he was called to take active operating charge of the property. This connection terminated in 1916, when he resigned as vice-president and general manager to become purchasing agent for the Allied Ordnance Department. Later he was commissioned in the United States Army and went overseas as assistant chief of ordnance in the American Expeditionary Forces. Before he went to San Francisco Mr. Black was vice-president and general manager of the Metropolitan Street Railway, Kansas City, Mo., as well as vice-president of the Kansas City Electric Light Company.

Mr. Black was graduated from Princeton in the arts course, and after a post-graduate course in engineering in that university he entered the employ of the Brush Electric Company and later went with the Westinghouse Electric & Manufacturing Company. He has been connected with Ford, Bacon & Davis, New York, since 1899, and is at present a vice-president of that firm, in which capacity he will continue.

In 1915 Mr. Black was president of the American Electric Railway Association.

Morton H. Dean Succeeds Alexander Jackson in Newark

Morton H. Dean has been appointed superintendent of time-tables Public Service Railway, Newark, N. J., succeeding Alexander Jackson, whose resignation from this position was mentioned in ELECTRIC RAILWAY JOURNAL issue of April 11, page 602. Promotion to be the head of the time-table department comes to Mr. Dean as the culmination of nearly twenty years experience in this work. His connection with the Public Service Railway dates from 1906, when he entered its employ soon after his graduation from school. During this entire time he has always been in the schedule department.

Prior to his promotion Mr. Dean occupied the position of chief clerk of the department. In this capacity he had become thoroughly familiar with the many perplexing problems connected with the preparation of time-tables for nearly 100 different car lines.

William Owen has succeeded John H. Clark as claim agent of the Oakwood Street Railway, Dayton, Ohio.

G. W. Comfort Manager at Poughkeepsie

G. W. Comfort has been appointed general manager of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., to succeed C. A. Brooks, who resigned recently to join the force of Fitkin & Company, New York, in charge of this railway property.

The appointment of Mr. Comfort to this post is another instance of a promotion from the ranks of the J. G. White Management Corporation, which operates this property. Fifteen years ago or, to be exact, on Feb. 14, 1910, Mr. Comfort started in the employ of the J. G. White Management Corporation in its New York office as stenographer. He was advanced from time to time as secretary to various officials, finally becoming executive secretary and general assistant to the president and vice-presidents of the J. G. White Management Corporation, being closely associated with Joseph K. Choate, vice-president.

G. W. Comfort

Part of Mr. Comfort's duties in this capacity consisted in accompanying his superiors on general inspections of public utility properties and in assisting Mr. Choate as receiver of the Aurora, Elgin & Chicago Railroad and the Morris County Traction Company. On three different occasions Mr. Comfort accompanied Mr. Choate to Nicaragua, Central America, for the purpose of inspecting and reporting on the operations of the Ferrocarril del Pacifico de Nicaragua, which property is also under the supervision of the J. G. White Management Corporation.

Mason B. Starring Succeeds C. N. Black at San Francisco

Mason B. Starring, New York, president of the United Railways Investment Company, holding organization for the Market Street Railway, San Francisco, Cal., has been elected president of the company at San Francisco to succeed Charles N. Black, resigned.

Mr. Starring is president of the California Corporation, California Railway & Power Company, Sierra & San Francisco Power Company and is identified in an official capacity with eight other large enterprises, including such well

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known companies as the Philadelphia Company, Duquesne Light Company, and the Pittsburgh Railways.

Mr. Starring was also elected to the board of directors of the Market Street Railway, succeeding to the vacancy caused by the resignation of B. S. Ginness of New York City.

W. S. W. Edgar has succeeded T. A. Ferneding as secretary of the City Railway, Dayton, Ohio.

Allen P. Parker is now president of the Waterbury & Milldale Tramway, Waterbury, Conn., succeeding C. H. Clark, deceased.

Abram A. Nesbitt has succeeded F. M. Kirby as president of the Wilkes-Barre Railway, Wilkes-Barre, Pa. E. L. Hossler has been appointed superintendent of transportation.

H. E. Ross, who has been auditor of the City Railway, Dayton, Ohio, for some time, was recently made treasurer of the company.

E. W. Jennison has been appointed engineer of maintenance of way of the Bangor Railway & Electric Company, Bangor, Me. In this capacity he succeeds W. E. Hooper, who had the title of chief engineer.

A. W. Allen of the McGraw-Hill publications has been appointed assistant editor of the ELECTRIC RAILWAY JOURNAL and *Bus Transportation* with headquarters at San Francisco. In 1917 he was engaged in private engineering practice in New York. He joined the McGraw-Hill forces in 1918 as metallurgical editor of *Engineering & Mining Journal*. Mr. Allen attended Plymouth Technical School and St. John's College, Cambridge, England.

Samuel Hutchinson of Kansas City has been appointed by Governor Baker of Missouri, on April 13, a member of the Missouri Public Service Commission. He succeeds R. H. Musser of Plattsburg. Hutchinson and Musser are Democrats. Governor Baker also plans to name a Democrat to succeed Commissioner Edward J. Bean, Democrat, of De Soto, Mo., who retired from the commission April 14. It is expected that this vacancy will be filled by a St. Louisan, as that city is without representation on the board. The Republican members of the board are: Thomas J. Brown, Charleston, Mo., chairman; Dudley Calfee of Jefferson City and Almon Ing, Poplar Bluff.

J. P. Ingle has been appointed receiver of the Jacksonville Traction Company, Jacksonville, Fla., to succeed the late E. J. Triay. Mr. Ingle has been connected with the company since 1922, going to Jacksonville from Haverhill, where he held the position of general manager with the Haverhill Gas & Lighting Company, also a Stone & Webster property. For eleven years previous to his Haverhill connection he had been in Keokuk, Iowa, where he went as superintendent of the Keokuk Electric Company. In 1914 he became general superintendent and in 1915 manager of the company. At one time he was associated with the Atlanta Gas Light Company, the Gas Light Company of Columbus, Ga., and the Baton Rouge Electric Company, Baton Rouge, La.

Another Job for Mr. Hawley

Head of Consolidated Car Heating Company Made a Member of Albany Port Commission

Cornell S. Hawley, the versatile president of the Consolidated Car Heating Company, Albany, N. Y., and member of the executive committee of the American Electric Railway Association, presided at the victory luncheon at Albany, on April 8, at which Albany celebrated its achievement in winning federal authorization for the deep river channel and creation by the state of the Albany Port Commission. Certainly Mr. Hawley will in no way be responsible if that city does not achieve the full measure of greatness as a port that rightfully belongs to it. As president of the Albany Chamber of Commerce and member of the Port Commission, Mr. Hawley has thrown himself wholeheartedly into the work of making the dream come true that Albany has cherished for many, many years, the dream of a port that will accommodate all but the very largest of the vessels that enter the port of New York. To accomplish this work $11,200,000 has been appropriated for deepening the Hudson for a distance of about 30 miles between Hudson and Albany by providing a 27-ft. channel at low water, 300 ft. in width. Five commissioners will control the work, four from Albany and one from Rensselaer. It will probably require five years to complete the undertaking. Just now the commissioners are looking for a port engineer.

C. S. Hawley

To Mr. Hawley the port work is the big thing. Even a contemplated trip to Europe, long anticipated by him, has been put aside in the better interest of Albany. It is a Hawley habit to follow through. Important as is Mr. Hawley's present port work, it is only one of the many activities of the man. He is not all business—far from it. His chamber of commerce work and his port work prove that, but even they are only instances. In the past he has been fuel administrator of Albany and during the war was treasurer of the Remington Arms U. M. C. Company. It has been said of him that he can "swing a mean mashie" and he has been known to do it at the Atlantic City conventions of the American Electric Railway Association. So Mr. Hawley has not forgotten how to relax, either.

Mr. Hawley was born in Waterford, Saratoga County, New York, and as a young man went to Washington, D. C., to study law. At Georgetown University he gained the degree of LL.B., and at Columbia law school, now the George Washington law school, he received the degree of LL.M. In 1898 he was admitted to the bar in Washington and in 1900 he passed the formal requirements for practicing law in New York State. But business beckoned to Mr. Hawley and he took a position with the Consolidated Car Heating Company in the sales department. Later he managed the company at Albany for four years and then became president of the Laconia Car Company. His work during the war has already been mentioned. After the war Mr. Hawley returned to the Consolidated Car Heating Company. Such, very briefly, is the record of this man, to whom business has been only the means to the much greater end of using his talents in the interests of his fellow man.

Joseph P. Autenreith, Jersey City, N. J., has been elected to succeed Harry V. Osborne as chairman of the Board of Public Utilities Commissioners of New Jersey. Former Congressman Charles Browne, Princeton, N. J., is the new member of the commission.

E. H. Maggard is president of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., in addition to general manager. Mr. Maggard was appointed general manager of the property early in 1916. At a very early age he entered the service of the Missouri, Kansas & Texas Railway at Dennison, Tex., as call boy and served until 1893, when he became a clerk in the freight office of the Southern Pacific at Houston. Later he became identified with the El Paso & Northeastern Railway at El Paso and in 1907 entered the employ of the Petaluma & Santa Rosa Railway as general freight and passenger agent. He continued in that capacity until promoted to the office of general manager, to succeed the late Elmer M. Van Frank, who was president and general manager of the company. Mr. Maggard succeeds Thomas MacClay as president.

Obituary

Amzi Smith, vice-president and general manager of the Johnston City Traction Corporation, Johnston City, Tenn., in 1923, died recently at Johnston City. He was vice-president and general manager of the Tennessee Eastern Electric Company. At one time Mr. Smith was connected with the street railway system in Washington, D. C.

Ralph C. Davidson, safety engineer American Abrasive Metals Company, died at his home in Plainfield, N. J., on April 15 after an illness of two days. He had been with the American Abrasive Metals Company since Jan. 1, 1918, and for ten years prior to that he was with the American Mason Safety Tread Company.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Watchful Waiting on Coal

Union Miners Unwilling to Reopen Jacksonville Agreement—Washington May Intervene

With one year's experience of the much-discussed Jacksonville agreement the status of the coal situation in this country remains practically unchanged. Although many opinions have been broadcast to the effect that some steps would have to be taken to relieve the coal operators of such overwhelming obligations as were part of the settlement made on Feb. 18, 1924, when the bituminous wage scale was renewed for a term of three years by miners and operators of the central competitive field, the fact remains that the agreement, binding the coal operators to a three-year contract at wartime wages, is in effect and is unlikely to be succeeded by any other settlement in the near future.

While it is evident that the union operators are in many instances being forced to close down their mines in the face of non-union competition, Illinois and Indiana are unwilling to come forward and seek an adjustment because it would put them in a weak position for bargaining with the union. They hope the union will soon weaken and ask a wage change. They prefer to bear the terrific inroads the wages make in their profits and work out quietly possible curtailments to offset the high wage expense. On the other hand, the miners in Ohio, Illinois, Indiana and Pennsylvania are unwilling to take the initial step which might lead to an amicable solution. Their labor leaders proclaim the Jacksonville agreement a panacea for the excessive production of the country, but the non-union mines in Kentucky and West Virginia are paying low wages, meeting the freight rates and forcing the union mines to live out of their capital.

The operators of Ohio and western Pennsylvania suppliantly asked a wage conference but President Lewis of the union refused.

It was recently stated that the administration at Washington, acting through Secretary Hoover, would shortly have a new coal policy ready. Just how this will affect the issue is problematical. The government sees the seriousness of the situation, but has made no indication that it will interfere in the matter. Embarrassment has been felt by Ohio and western Pennsylvania operators who have done the seeking, and the hands of the men are pretty tightly tied, since their leaders have political consequence to face.

In some districts the men have found employment in the steel plants, but in others operators are turning their mines over to the employees to manage and operate. These experiments in co-operative production have not proved altogether successful. In Indiana this plan has been condemned by officials of the union, who have moved to check what they term abuses of the system which involve the working of mines by union miners on shares and in violation of union laws.

John L. Lewis, president of the United Mine Workers of America, recently summed up the situation. He said that previous to the Jacksonville agreement the law of supply and demand had been defeated by a strike practically every year; that the Jacksonville agreement meant no strike and no accompanying boost in prices for the next three years, and this meant that uneconomic mines unable to take advantage of periodic famines and increased prices would gradually be forced out of the field. "This may sound like harsh medicine," he claimed, "but is just as harsh for the miner who has to find a new job and move his family as it is for the owner who has to abandon his mine. It was unsound national economics to keep 40 per cent too many mines in operation and 150,000 extra men in an industry which did not need them."

According to *Coal Age*, if union mines have been forced to close solely because they have been paying the union scale and not because they are inherently high-cost mines, then it is to the public interest that they be reopened, "but a wage cut carried so far that high-cost mines could be reopened admittedly would not be best for the country as a whole, nor to the union operators nor the union men." Further, it believes that a conference should recognize that some of the elimination of excess mines has been a good thing. Its effort should not be to get all the union mines into operation, but to take action calculated to encourage the best to run full time. All this will mean a change in the wage policy of the union. That magazine thinks, further, that the union could well afford to concede lower rates to those mines that could guarantee steady employment. A change in the policy of the United Mine Workers would mean that the union would attempt to obtain steady work and steady pay only for the number of men needed by the industry rather than to get some work and some pay for every miner. Meanwhile, conjecture and opinion go on and the Jacksonville agreement remains in effect.

Elimination of Waste in Industry

Hoover, Swope and Green Discuss Methods of Increasing Production by Collective Effort—Costs Can Be Lowered by Greater Efficiency in Manufacture

WASTE elimination and the minimizing of industrial controversy were discussed from the sides of employer, employee and the public at the first Industrial Round Table of the National Civic Federation, in New York, on April 11. Herbert Hoover, Secretary of Commerce, and Gerard Swope, president of the General Electric Company, gave the viewpoints of the public and of the employer respectively, while William Green, president of the American Federation of Labor, spoke regarding the attitude of labor toward industrial controversy and waste elimination.

Mr. Hoover's text was that the greatest opportunity for increased wages and higher standards of living for the worker lay in eliminating industrial wastes. These wastes can be reduced only by collective effort. "They contain," he declared, "the paradox that if we save collectively, we will have more goods and services to expend individually." Illustrating the possibilities, he commented on the fine showing of our railways in the last three years. They have handled a 14 per cent increase in gross operating expenses. Rates have been decreased more than 5 per cent, the hours of the workers have decreased and the wage has increased slightly. Service to the community has been immeasurably improved, and all this due to great effort in management and the co-operation of the employees and of the community itself. He cited also the waste elimination efforts under way in the construction industry as typical of effective effort.

He declared that there is hope that America is finding a solution of the problem of securing social satisfaction with the preservation of private industry, of initiative and full development of the individual. This is being brought about by recognition of the identity of interest of employer and employed and the effort to organize that identity in order to limit the area of conflict. Waste elimination is one of the subjects in which there is identity of interest.

MAKING THE EMPLOYEE THINK

Mr. Swope maintained that waste elimination can be greatly furthered if the thought of the workers can be directed to the subject. He related that in an organization of 60,000 workers, 8,000 suggestions were received in 1923 and 10,000 in 1924. Of these 5,000 had been put in practice, and $100,000 had been paid, over and above wages, to the workers who had made the suggestions. He stood, he declared, for lower selling prices of commodities and showed that lower prices are not incompatible with higher wages. Incandescent lamps, for example, are now cheaper than they were before the war, yet the earnings of the workers have increased 100 per cent. The "labor content" of each lamp, however,

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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MORRIS BUCK, *Managing Editor*

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Directors Familiar with Transportation Deserve Re-election

ELECTRIC railway companies are interested in the election which will take place May 20-22 of directors of the Chamber of Commerce of the United States. Under the two years' term of directors of that body, half of the membership of the board is chosen each year, and the selection is made by the national councillors representing the various organizations in the membership. This paper has had occasion in the past to refer to the valuable work being done by the United States chamber in helping to solve national transportation problems. The consideration which this organization has given to electric railway questions has been of material aid to the electric railway industry.

The list of nominees for the office of director at the May election, recently made public, shows that several of the present members of the board are closely allied in one way or another with the electric railway industry and would be especially well qualified to serve the chamber because of their knowledge of local transportation topics. This applies particularly to Paul Shoup of San Francisco, a director of the foreign commerce group; P. H. Gadsden of Philadelphia, a director from the second election district; A. J. Brosseau of New York, a director of the manufactures (fabricated productions) group and A. L. Humphrey of Pittsburgh, a director of the transportation and communication group. No discrimination is intended in favor of these gentlemen and against other candidates for the office of director, to say that they deserve re-election. Mr. Gadsden's candidacy for this office was mentioned several weeks ago in these columns.

Railway men who expect to represent their chambers of commerce at the annual meeting in Washington can well support these candidates. If the railway man does not expect to go himself to Washington, he can sincerely indorse them as able, conscientious workers who understand transportation problems to the official delegate from his chamber or board of trade.

Technical Sessions Are Needed at Conventions

GENERAL utility subjects formed the entire program at the annual meeting of the Wisconsin Utilities Association recently held in Milwaukee and reported in this issue. This is a departure from established practice. In the past sectional sessions of the association have been held for the railway, gas and electric men. President Neff called attention to this change in the program and explained that meetings of the individual sections had been held separately during the year in order that the time of the annual convention could be devoted entirely to important problems of public relations, utility regulation and finance.

Modernization and merchandising transportation, on the other hand, are subjects which occupy first place in the minds of all progressive railway managers, and which apply specifically to the railway business. Then, too, there is a pressing need for the discussion of technical subjects, since even with its 40 years' experience the industry is always developing new methods and new equipment. Consequently such things as transportation practice, traffic congestion, bus operation, track design, car design, and maintenance methods are topics of extreme importance to the electric railway man.

If engineers and operating men are to be encouraged to attend meetings of utility associations, every opportunity must be given them to interchange ideas and compare methods. For this reason technical sessions for the railway men must not be overlooked if their support is to be retained by the state and sectional associations.

Close Relation Between City Planning and Transportation

CITY planning of an intelligent sort evidently is more needed now than ever before. When there were no automobiles and but few high buildings street congestion was almost unknown and almost any arrangement of city streets was practicable. In those days city planners thought their one great object was to produce beautiful vistas. An imposing building or monument was placed at the end of a broad avenue or in a circle from which radiated a number of avenues. The original plan of Washington, D. C., by Major L'Enfant and the reconstruction of central districts of Paris under Napoleon III belong to this period.

Apart from the esthetic side of city planning, two allied main problems are to be solved in the development of large communities. One of them is how best to direct the development of the community so that transportation problems do not become too acute. The second is to solve those transportation problems which exist and provide for solution of those in the growing sections of the community. Of little use is a fine city architecturally if its inhabitants cannot get about easily as the demands of business and social engagements dictate or in which commodities cannot be transported quickly and economically.

Four causes have largely brought about these new problems. First is the great increase in tall buildings, containing often thousands of tenants who have to use streets and transportation facilities designed when the abutting buildings hardly exceeded four or five stories. Second is the drift of population to the cities. Third, modern living and business conditions call for more local transportation from the average individual than

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in former years. Fourth is the great increase in number of vehicles on the streets, owing partly to an added demand for transportation and partly to the recent development and present extensive use of the private vehicle. Obviously, then, if the people in our cities of 50 and 100 years from now are to get around with any sort of convenience and dispatch, steps must be taken promptly to change the trend toward constantly greater street congestion, which has been so conspicuous during the last 20 years.

At the city planning convention held in New York during the present week much consideration was given to transportation. Broadly speaking, three remedies, in addition to more and better transportation facilities, were suggested. These were decentralization of business, limitation of future heights of buildings and traffic regulation. There was also a clear recognition by the delegates present of the close relationship of good transportation to better city living conditions. Altogether the convention emphasized the need of the very closest co-operative work between the local railway and those civic interests endeavoring to bring about better city development.

Texas Electrification
Another Example of Co-operation

DUPLICATION of effort always is wasteful and frequently results in serious losses. On the contrary, proper planning may make possible a much more intensive use of an existing plant, with correspondingly good financial results. The electrification of the Missouri-Kansas-Texas Railroad between Dallas and Denton, described in this issue, is an illustration of the latter viewpoint. Handling all the business that the steam railroad has been able to develop after many years, the addition of a comparatively small investment in power distribution equipment and rolling stock has made it possible to use the steam railroad facilities for all the purposes of an interurban railway as well. The two services do not conflict, and a new field of usefulness has been exploited to the benefit of public and investor alike.

Conditions of a similar sort exist in many parts of the country. The steam railroad is not fitted to render the type of frequent service that is demanded by local passengers. Usually its management has had no desire to go into the local business with its steam trains. This was the universal idea 25 years ago. As a result, many interurban electric railways were built to give this type of service, thus meeting a demand of the inhabitants along the route. Generally speaking, there was not sufficient traffic to justify the construction of two separate and competing lines, for either track would have had capacity to handle it all. Even where the traffic was too great for a single-track line, the construction of a second track on the same right-of-way would have given much more capacity than to build a second single-track line for competitive purposes. The first cost and the operating expenses would be decidedly less for the system with joint steam and electric service.

Operation of the new line will be watched with much interest, as there is in it the promise of extending this same method to a much greater extent elsewhere than has been attempted in the past. It is to be hoped that this solution of the local interurban transportation problem will be as good as present conditions indicate. With several months' operation, the statement is made that it is successful far beyond any expectations.

Recent Bus Proposals
Command Attention

UNUSUALLY significant bus news has been contained in recent issues of ELECTRIC RAILWAY JOURNAL. One may or may not agree with the ideas behind all of the undertakings that are proposed, but one can not ignore them as news. A complete recapitulation of the proposals at this time is unnecessary. It is their magnitude and geographical distribution that are significant. Among the cities involved are New York, Kansas City, Cleveland, Detroit, Atlanta and Denver. The New York matter is still very much up in the air, but all of the others give promise of early fruition. Into the details of all of them it is impossible to go, but it is important to note that in general 10-cent fares are provided. In New York City the proposal of the New York Railways would carry a 5-cent fare on cross-town lines, but these lines are unusually short.

After all, the significant thing is that the railways more and more are growing appreciative of the possibilities of the bus. In the New York Railways case Receiver Sheeran is to be particularly commended for his foresight. His system has labored under the tremendous handicap of a receivership. It has in the past been criticised on the score of the condition of the physical property and the slowness of operation, but Mr. Sheeran has been hampered in his work by lack of funds with which to correct defects of which he was quite conscious, and has been prevented from attaining as high a degree of perfection in getting cars over the line as he desired because of increasing street congestion, a phase of operation in which the police are now giving a greater degree of co-operation. With the lifting of the New York Railways receivership, set now to be consummated on May 1, Mr. Sheeran will be in a position, if he is given half a chance by the New York City administration, to restore this system to its proper place as a part of New York's transportation scheme. The Kansas City Railways also operates under the limitation of receivership.

Similarly the bus proposal of the Third Avenue Railway, New York, calls for 5-cent and 10-cent lines. This system, perhaps not quite as sorely beset as the New York Railways, also is handicapped with the 5-cent fare. Its management is no less cognizant of the needs of the city than is that of the New York Railways.

As indicated previously, one does not have to agree with the proposals in all their details to recognize the appeal that they make from this point of view of news. They do, however, compel reflection. In the past, of course, there has been much justifiable complaint on the part of the railways of their inability always to earn an adequate return. That is an important point. The railways can no more afford to operate bus lines at a loss than they can railway lines. In developing their plans for utilizing the bus the railways will have to be careful that the mistake of early electric railway days is not repeated—the mistake of contracting to furnish service that may never be made to pay, even with application of the most intensive selling methods.

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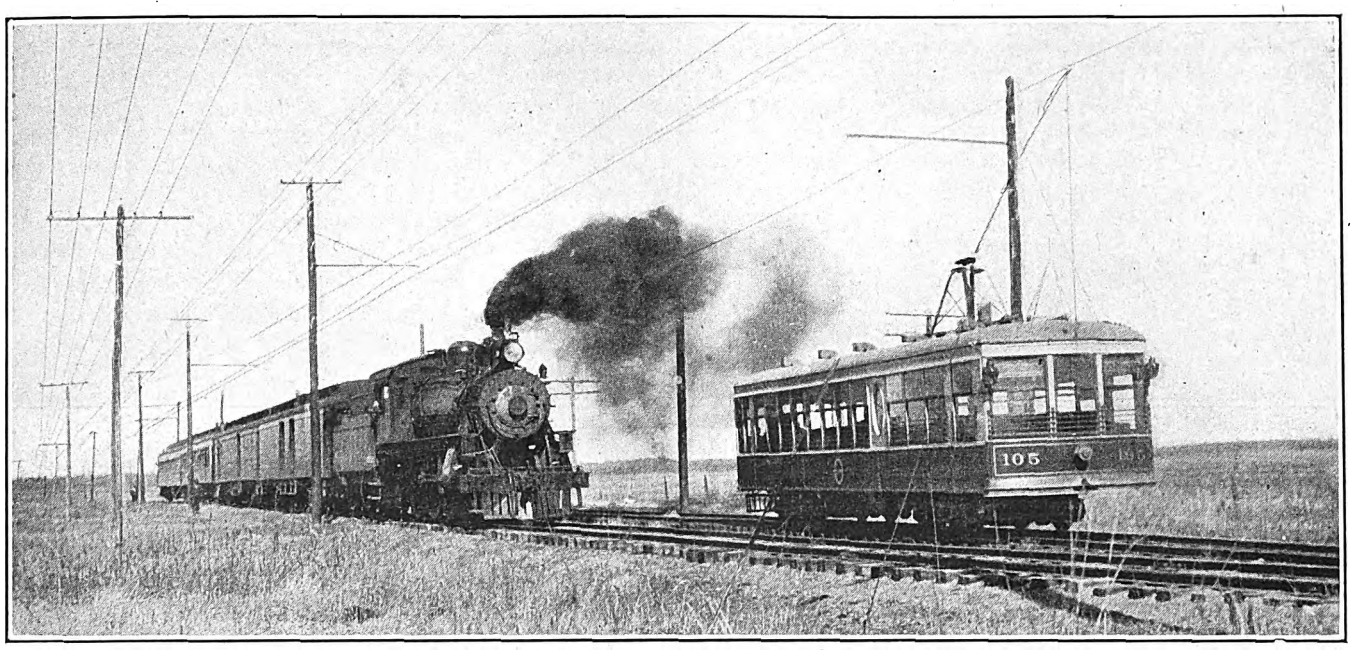

Interurban Car of the Texas Interurban Railway on a Siding to Allow a Katy Steam Train to Pass on the Main Line

Steam Line Electrified to Furnish Interurban Service

By B. F. Cooke
Superintendent of Power Texas Interurban Railway
Dallas, Tex.

The Texas Interurban Railway Uses the Tracks of the M-K-T Railway Between Dallas and Denton — The Same Tracks Are Used for Steam Railroad Freight and Passenger Service — High-Speed Catenary Construction and Supervisory-Controlled Substations Form Principal New Work — Method of Operation and Contract Between the Two Companies Are Described

ONE of the most interesting recent developments in the electric railway field is the joint use by both steam trains and electric cars of an existing steam railroad track. This has been accomplished by the electrification of the Denton division of the Missouri-Kansas-Texas Railroad of Texas, between Dallas and Denton, which recently was completed by the Texas Interurban Railway. Interurban service between these terminals was begun on Oct. 1, 1924.

The Dallas-Denton interurban serves Dallas, which has a population of 160,000; Denton, with a population of 7,626, and four intermediate towns with populations ranging from 300 to 1,000. The population of the territories served averages 1,200 per square mile. Garza is the location of a new dam site for a water reservoir for the city of Dallas, and at present a thousand workers are employed on the project. Denton is the county seat of Denton County and the home of the College of Industrial Arts, a large school for women, and the North Texas Teachers' College. These schools have a combined enrollment of nearly 4,000 students.

The distance between the terminals is 38.66 miles, of which 33.48 miles is on the steam railroad company's tracks. From the interurban station at Dallas to the city limits the interurban uses its own tracks and those of the Dallas Railway, which operates the city lines in Dallas. From the city limits to Texaco, where the interurban tracks connect with the M-K-T Railway, 1.5 miles of new track was built. In Denton the interurban leaves the railroad tracks at Oak Street and runs over its own tracks to the interurban station, which is located on McKinney Avenue in the business district. Several additional sidings were built to accommodate meeting trains along the line of the railroad between Dallas and Denton. On all new work 70-lb. rails were used, while the steam road uses 66-lb. rails.

Two trestles were built by the interurban company just outside of Dallas. One of these, which is approximately 400 ft. long, is of pile construction. This spans Cedar Springs Creek and furnishes an underpass for a proposed highway. The other trestle, which is approximately ¼ mile long, is of steel construction supported by concrete pilasters. It spans a small creek and furnishes an underpass for a country road and also the St. Louis-Southwestern Railroad. The trestle work gives an ascent to the overpass on a 5 per cent grade, along with a 20-deg. reverse curve. Both of these were necessitated by the existing street and railroad grades. This latter trestle cost approximately $45,000.

The location of the electrified section of the steam railroad and the connections for reaching the centers of both cities are shown on the accompanying map.

The new work was done by the Texas Construction Company, which concern also built the Dallas-Terrell line. Apart from the comparatively small amount of track construction necessary, the principal expense was

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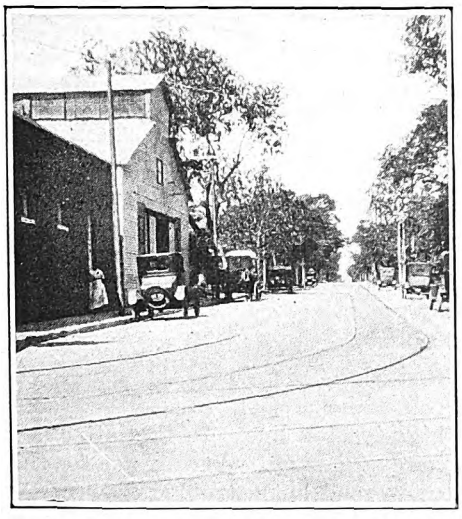
for the construction of the contact line and power distribution circuits. Power is furnished by four substations. One of these is located 1 mile from Dallas and is manually operated, while the other three are automatic. They are located respectively 13.5, 24.5 and 36.5 miles from Dallas, leaving a 2-mile stub feed on the Denton end. The manually-operated station is owned and maintained by the Dallas Power & Light Company, which also furnishes power for the operation of city and interurban cars on other lines. This station contains one 1,000-kw., 600-volt d.c. motor-generator set supplied by the General Electric Company, and has space for two additional machines of the same rating.

The three automatic substations, which also were supplied by the same manufacturer, are owned and maintained by the interurban railway. Power for these stations is furnished by the Texas Power & Light Company from its 60-kv. high-tension line which serves this territory. As shown in one of the illustrations, the automatic substations are of the semi-inclosed type. The high-tension structures, which are of the outdoor type, are used to serve the small towns in their vicinity as well as to supply the railway with power. The converter and switching equipment are housed in a brick structure 20 ft. by 20 ft. inside. Louvers in the walls near the floor and vents in the roof can be opened and closed as necessary to regulate the room temperature and provide adequate ventilation. The voltage is stepped down from the high-tension side through a HJTH three-phase-six-phase 300-kva. transformer, with "Y" connected primary and diametrically connected secondary. This transformer delivers alternating current at 445 volts to a 300-kw. rotary converter, which changes it to 600 volts d.c. The auxiliary equipment of each substation includes a.c. and d.c. lightning arresters, a 5-kva. control power transformer, 445 to 220-110 volts, and the automatic switching equipment for the control of a rotary converter. One of the innovations in the automatic equipment is the use of time delay relays. These afford a more definite and wider range of time settings than the oil dash pot relays used in earlier stations.

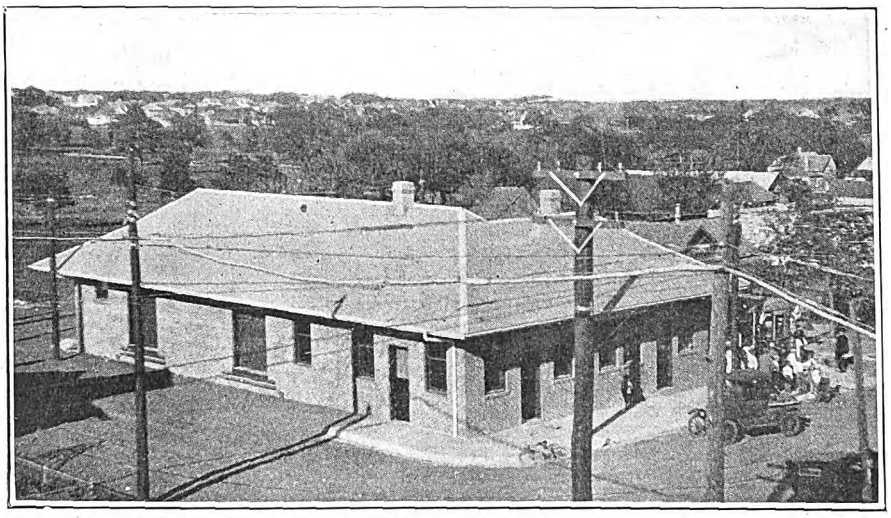
Each station has a ¾-in. galvanized pipe running from inside the building underground to a post near the track, where it is brought up to a convenient point and equipped with a short hose for connection with the compressed air tank on the railway line car. This line car makes an inspection trip once a week and stops at each station so that the inspector can blow out the machinery. The same outfit is available for air-brush painting the converter winding annually.

The permanent negative return from the rails to the station consists of a 1,000,000-circ.mil bare copper stranded cable run under ground in 2-in. galvanized pipe, bonded at the joints. A brass wiping cap was screwed on at each end of the pipe and a joint wiped to the copper cable. This includes the pipe in the return circuit in addition to protecting the copper from mechanical injury. The copper conductor is soldered to five No. 0000 cross bonds connecting to the rails. The entire track is bonded with No. 0000 ribbon brazed bonds, with No. 0000 cross bonds tying the two rails together at every feed-in tap.

The positive feeder between station and trolley wire feeder consists of a 750,000 circ.mil lead-covered copper cable, insulated for 3,000 volts. This cable is also run through a 2-in. galvanized conduit which was run from the station under a paved highway and up a pole to a pothead just below the trolley wire feeder. The iron conduit is considered an adequate protection against lightning. However, a Garton-Daniels panelboard arrester was installed on the pole to protect the cable from lightning. The 3,000-volt insulation was used as an extra precautionary measure, and the usual precautions were taken to protect both cable and conduit from electrolysis.



Track at Fairmount and McKinney Avenues, Denton



This Interurban Station at Denton Was Built by the Electric Railway Company

FIVE-POINT CATENARY SUSPENSION USED

The overhead system is of the catenary type with five-point suspension supported by single 40-ft. poles set 9 ft. below the top of the rail, and spaced approximately on 150-ft. centers except along the tracks of the interurban company near Dallas and also near Denton, where direct suspension is used with 100-ft. pole spacing. Spacing between individual poles, however, is governed by existing conditions. The poles are of Southern long-leaf yellow pine treated by the Rueping process. All poles are back-guyed, using never-creep anchors. Storm guys are placed every half mile and at each end of curves. The trolley wire is No. 0000 grooved copper supported by ⅞-in. Siemens-Martin double-galvanized stranded steel. The trolley wire is paralleled its entire

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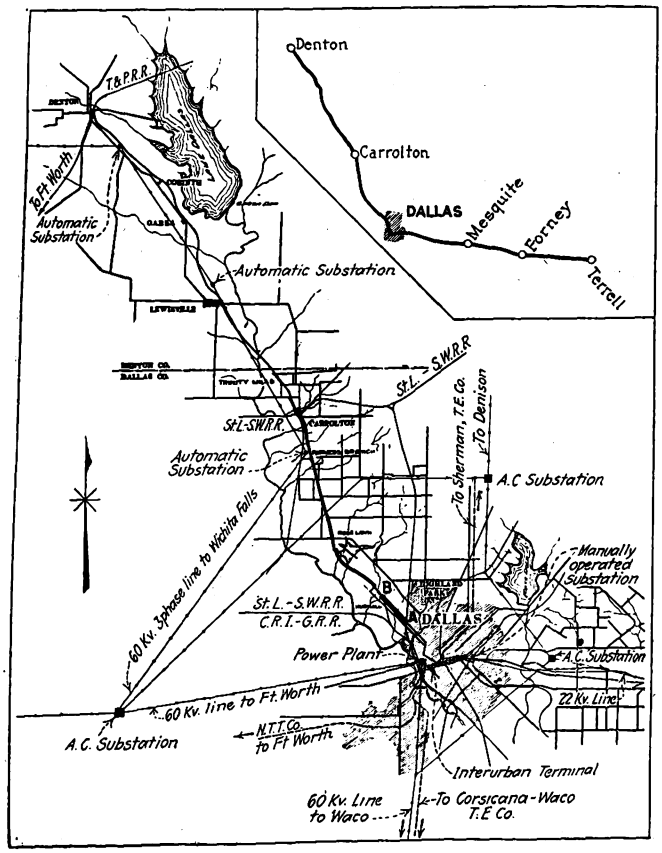
distance by a 300,000-circ.mil feeder mounted on Pierce steel brackets. There are six feed-in taps to the mile. A Garton-Daniels lightning arrester is installed at each feed-in tap. Corrugated cast-iron plates were set under the bases of the poles, and a ¾-in. galvanized pipe screwed into the plate and extending 6 in. above the ground was used for lightning arrester grounding. A



Of the 38.66 Miles of Interurban Route Between Dallas and Denton, Texas, 33.5 Are Electrified Steam Railroad

brass cap screwed on the end of the pipe afforded a convenient means of connecting the ground wire. The ground wire was also tapped and soldered to the rail cross bonds.

TELEPHONE DISPATCHING IS COMBINED WITH SUPERVISORY CONTROL

A telephone line, consisting of two metallic return circuits, extends from Denton to Terrell, the terminal of another interurban railway operated by the same management, by way of Dallas.* One of these circuits, known as the dispatcher's line, is normally used for dispatching trains over both the Denton and Terrell divisions. Under normal conditions the dispatcher listens in on this line at all times. The other circuit, which is known as the commercial line, is normally used for commercial purposes and for the supervisory control of the automatic substations on the Denton division.

In connection with the supervisory control system a third line wire is used. Western Electric selector apparatus is used on both the commercial and dispatcher's circuits. Each line is equipped separately with key cabinet and keys, apparatus cabinet and storage battery. The commercial line also serves as an emergency line for dispatching. In case of trouble on one line the dispatcher plugs in on the other. The telephones at the various booths and way stations along the line are equipped with jack boxes and plugs which permit plugging the instruments in on either line.

The train dispatcher has charge of the automatic substations through the supervisory control system. He also serves as telephone switchboard operator for the commercial line. For instance, if Denton wanted to talk to Terrell, Denton would plug in on the commercial line and ask the dispatcher to ring Terrell. The dispatcher would then plug back on the commercial line for the conversation, having rung Terrell on this line. Each way station is equipped with two selectors, one for each line.

Use of supervisory control for operating the automatic substations has been found to have several advantages over straight automatic operation. Three selector keys and two signal lights, one red and one green, are used with each station. One key is used for starting, one for stopping and the third for turning the station over for automatic operation. The signal lights indicate whether a station is running or shut down, red indicating that the station is running and green showing that it is stopped. A bell in the office rings whenever a change in the lights takes place, informing the dispatcher that a station is either starting or stopping. These signal indications are a great help in preventing delays in train service, due to lack of power. In case a station shuts down when one of the protective devices functions or if there is trouble on the high-tension line, the dispatcher is immediately informed. Usually he can get a trouble man on the job before a delay results. Without the signals he would not know of the trouble until the trains had become delayed, and not then would he be able to tell which station was out. With the signal lights he knows which stations caused the trouble or if it is on the high-tension line. In the latter case he can notify the power company. Were it not for this he might unnecessarily send out a trouble crew of the interurban.

Conditions peculiar to this system make advantageous the method of starting and stopping the substation by means of selector keys at the dispatcher's office. With automatic operation the cars will hold the substation on the line continuously through the day, even though it operates at an uneconomical load. This is because of the frequency of stops along the line. The time-delay stopping relay will reset due to the rush of current when a car starts, and before the relay has timed out another stop will reset it. To shorten the time setting so the station would shut down in this case also would cause it to shut down when a car makes a stop or is waiting on a siding. This would be more detrimental to the station equipment than continuous running.

As each agent reports to the train dispatcher when a train passes his station, the location of trains is known by the dispatcher at all times. Accordingly he can tell where there is a demand for power and can operate the substations accordingly. A regular operating schedule has been prepared for the substations which can be used except when trains are late, which is a rare occurrence on this system. Ordinarily the dispatcher starts or stops the stations at predetermined times according to the schedule. In case of delays the dispatcher uses his own judgment and starts or stops the

*The Terrell division is owned by the interurban company and is 31.5 miles in length. It was described in ELECTRIC RAILWAY JOURNAL for April 7, 1923, page 591.

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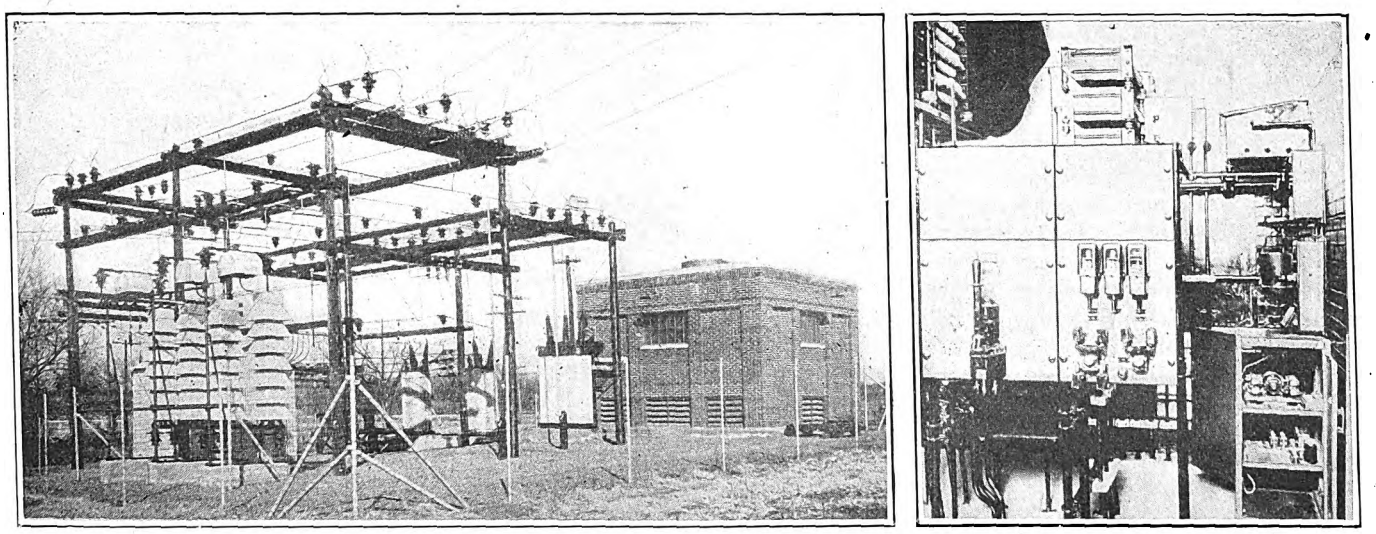
stations according to the demand for power. It is, of course, possible for the dispatcher to lock in all of the stations and keep them running until the trains get back on schedule time.

Automatic starting relays, which consist of contact-making voltmeters, are placed in the substations and are set to start the station in case of trolley voltage reaching a certain minimum. The stopping relay will stop it in case of prolonged underload, regardless of the supervisory control system. Hence in case the dispatcher fails to operate the stations they will function automatically, thus eliminating the only objectionable feature of supervisory control.

It has been calculated that the use of supervisory control on this system will result in a saving of more than $1,000 a year in reduction of conversion losses, in addition to the resultant saving in maintenance and depreciation. Another feature is that by adding a key to the key cabinet and a selector with auxiliary equipment, practically any kind of a signal can be given by the dispatcher at any point on the line. At present no such signals are in use, but in case future developments demand them the equipment can be installed at a very small cost.



The Automatic Substations Have the Alternating-Current Apparatus Outdoors, While the Rotary Converter and Control Equipment Are Housed—At Right, Selector Type Supervisory Control Cabinet and Auxiliary Panel

Rolling Stock Interchangeable with Terrell Line

Six light-weight one-man passenger cars and one express car comprise the rolling stock. The Terrell line has five passenger cars and two express cars of the same type. This makes a total of eleven passenger and three express cars for the two lines, all of which are interchangeable. Seven passenger cars and two express cars are required for schedule operation on both lines. Four passenger cars are needed on the Denton division, three passenger cars on the Terrell division and one express car on each. The remaining equipment is reserved for emergency use.

The passenger cars weigh approximately 32,000 lb. and are 45 ft. in length over all. They seat 52 passengers, and have a standing capacity of approximately 100. Each car is equipped with four GE-265-A 35-hp. motors, one K-35 controller, Brill 77-E-1 trucks with 26-in. wheels, a 15-cu.ft. air compressor, and straight air brakes with auxiliary valves for opening and closing the sliding door.

Fares are collected with the aid of a locked fare box mounted near the car entrance. A destination check having a number printed on each side is handed to each passenger as he drops his fare in the box on entering. This number corresponds with the number of the stop to which the passenger has paid his fare. The check is deposited in the box by the passenger as he leaves the car.

Railroad and Interurban Schedules

All trains operate under the standard rule of the steam railroad, so far as they are applicable. In addition, special rules were drafted by the officials of the two companies to govern joint operation of steam and electric trains. Passenger trains, both steam and electric, are designated first class. Electric express cars are second class and steam freight trains are third class.

Interurban passenger service is provided hourly in each direction from 5 a.m. until 11 p.m. Two express cars are operated each way daily by the Electric Express & Baggage Company. The Missouri-Kansas-Texas Railroad operates four steam passenger trains and two freight trains daily. Two of the steam road passenger trains and all freight trains are operated at night. The schedule of running time between the city limits of Dallas and Denton averages 28 m.p.h. The 3½-mile run from the interurban station at Dallas to the city limits takes eighteen minutes, while the total running time for the 38.66 miles from Dallas interurban station to the Denton interurban station is one hour and 40 minutes.

Dispatchers of the steam railroad control the movement of all trains over the system. The office of the dispatcher is located at the junction of the railroad and the interurban tracks just beyond the Dallas city limits. The same dispatcher also handles trains over the Terrell division. Track switches at the junction are normally set for interurban operation. The dispatcher operates the switch for steam trains at the junction near Dallas, but one of the train crew has to operate the switch near Denton, so that it is necessary to stop steam trains at the latter junction.

Where meets occur between steam passenger trains and interurban cars the steam train has the right of way and occupies the main line while the interurban

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takes the siding. This procedure was adopted because it is much easier for the interurban car to take the siding. The car generally clears the main line in time to allow the steam train to pass on without making a stop. The trains, however, are required to approach meeting points under control. Each interurban car carries a negro porter who attends to flagging and who also assists passengers with their baggage.

So far the joint operation of the different types of trains over the same tracks has been successful beyond all expectations.

Terms of Contract Between Railroad and Interurban

Under the contract for joint use of the railroad property by the interurban company it is provided that the Missouri-Kansas-Texas Railroad of Texas will care for maintenance, dispatching and supervision of the property jointly used, for which it will be reimbursed monthly by the interurban company. Provision is made for joint use of all railway property, including tracks, stations and appurtenances, by each party to the contract in such manner as if it were the sole owner, providing that such use shall not be inconsistent with the rights of either party.

Such employees as are jointly used are employed by the railway and may be discharged, for sufficient cause, upon complaint of the interurban and satisfactory employees engaged. Salary or wages of such joint employees are prorated between the two companies. It is understood that joint employees will serve impartially and without favor to either party.

The interurban is permitted to handle passengers, mail, freight and express, the only exception being that it may not handle freight in carload lots to or from Love Field industrial district, near Dallas. It may handle freight in less than carload lots and local freight, without special permission by the railway. Written consent must be obtained for carload lots. Express is to be handled subject to limitations of agreement between the railway and the American Railway Express Company.

The railway may permit other railways to use its lines, provided there is no interference with interurban use.

The interurban may not permit others to use the railway line without consent of the railway company. It is provided, however, that the interurban may extend its lines into territory served by the railroad and connect such service with its line using railway property.

The railway is to maintain its property in a condition suitable for operation. Such improvements, betterments and additions as are required for interurban use shall be made by the railway and paid for by the interurban at cost, plus 10 per cent for supervision. Materials used in such work will be paid for by the interurban at cost, plus 15 per cent for purchase, storing, accounting and freight. Such additions, improvements and betterments shall be the exclusive property of the interurban and maintained by it. The railway reserves the right at any time to purchase such improvements at reproduction cost new, less depreciation.

While the railway is charged with the maintenance of property jointly used, it is provided that if, upon written notice, it fails to make necessary maintenance or improvements, or if it is unable to act because of strikes, or conditions beyond its control, the interurban may do such work and bill the railway.

It is expressly stated that the contract for joint use of the railway line does not enlarge the duties and obligations of the interurban beyond those which would be imposed on it were it to construct, maintain and operate its own line. Federal, state and municipal laws and regulations applying to steam road operation do not apply to the interurban using the railway lines because of this joint usage.

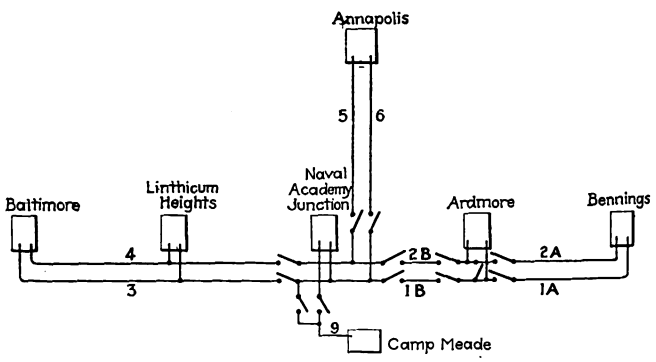
The interurban may use its transmission lines solely for current used in its operation.

Under the contract for joint use of the railway lines, the interurban is to pay in monthly installments a fixed annual rental equivalent to 3 per cent of the valuation of the railway property jointly used, as established by the Interstate Commerce Commission. It also pays monthly one-twelfth of 3 per cent per annum on all total expenditures, less the value of permanent retirements, made by the railway for additions, betterments and improvements of the jointly used property. Taxes on jointly used property are divided equally between the two companies.

In case differences arise, they may be submitted to a board of arbitration composed of three arbitrators, one chosen by each of the parties and the two so chosen selecting the third.

Parallel Transmission Lines Insure Continuity of Power Supply

POWER used in the operation of the Washington, Baltimore & Annapolis Electric Railroad and its subsidiary, the Annapolis & Chesapeake Bay Power Company, is furnished from the plant of the Potomac Electric Power Company, Washington, D. C. Energy is delivered from the main power plant to the Bennings substation, which is located alongside, and this substation is operated jointly by the Washington, Baltimore & Annapolis Electric Railroad and the Washington Railway & Electric Company. From this point



Transmission Lines of the W., B. & A. Electric Railroad Are Divided into Sections and Connections Provided for Emergency Use

the railroad has duplicate 33,000-volt transmission lines through to Baltimore and Annapolis.

Under normal operation one transmission line is used for the operation of the railroad and the other for the operation of the Annapolis & Chesapeake Bay Power Company, but in case of emergency either transmission line carries the entire load. These transmission lines are divided into sections as shown on the accompanying plan and interconnected at Ardmore and Naval Academy Junction substations. It is thus possible to send power through to Baltimore and Annapolis by using alternate sections of the two lines.

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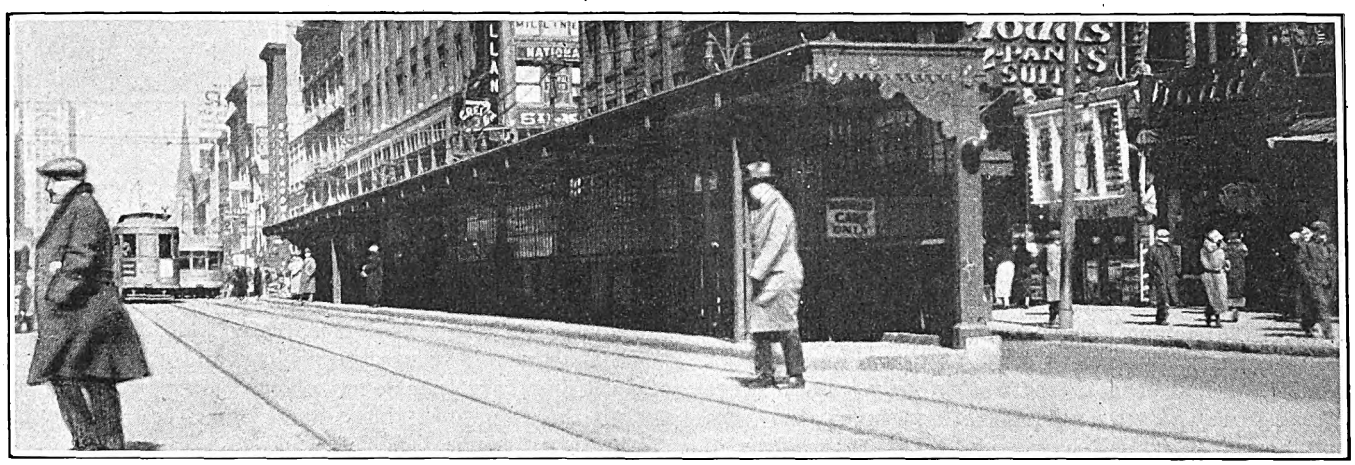
Shelter Combined with Island Platform

Detroit Department of Street Railways Erects Roofed Loading Station at Busy Point on Woodward Avenue—Structure Includes Raised Platform 220 Ft. Long—Double Berthing Adopted for Two Car Lines—Vehicle Traffic Has Been Accelerated

By G. A. Peterson
Construction Engineer Department of Street Railways, Detroit



This Covered Shelter in Downtown Detroit Protects Waiting Passengers Against Inclement Weather

FROM a transportation viewpoint the intersection of Woodward Avenue and State Street, Detroit, is one of the heaviest loading points on the busiest line of the Department of Street Railways' system. Located in the heart of the retail district and adjacent to the office building section of Detroit, approximately 14,000 people board the cars daily at this point, of which number about 6,000 are transported between the hours of 3 p.m. and 6 p.m. Motor car traffic on Woodward Avenue is also very dense, and the intersection is under control of traffic officers at all times, except late at night and during the early morning hours. A safety zone of the raised platform type has been in use at this intersection for some time to accommodate northbound car riders. Two city car lines pass this zone, the Woodward line and the Hamilton line, and in addition all northbound interurban cars.

The question of providing a shelter for passengers using this zone had received the attention of the Department of Street Railways during the previous year, but, on account of the experimental nature of the structure, decision to erect it was not reached until December, 1924. It is unique in the respect that it takes up no more of the street area than that required by the usual raised loading platform.

The length of the structure is 220 ft., divided into eleven bays of 20 ft. each. In three of these, symmetrical about the center line, are placed entrances facing the curb. At the division points between the bays are the twelve 9-in. double-channel columns, which, by means of cantilever beams, support the roof of the shelter and are held to concrete foundations with anchor bolts. There are no column supports on the track side.

The width outside to outside of the concrete platform is 7 ft. 1½ in. Its front edge is 2 ft. 3 in. from the gage line of the rail and 5 ft. 10¼ in. from the front face of the columns. From the top of platform to the under side of the steel purline the distance is 8 ft. 6 in.

The upper portion of the openings in the rear wall of the shelter between columns is closed with standard non-ventilating steel sash, glazed with polished wire glass. Below the sash sheet steel panels are used to close openings between the concrete platform and the sills. It is not intended to remove any portion of the rear wall during the summer months.

The roof is made of 2-in. dressed and matched lumber, covered with prepared roofing and metal flashed. At each column a metal sump is inserted and connected by means of wrought iron pipe on the inside of the column to a box in the concrete platform which discharges rain water on the surface of the street.

On account of the prominent location of the shelter, particular attention was given to its appearance. An ornamental treatment, consisting of applied castings and wrought iron moldings, was designed to relieve the stiff lines of the steel frame and to be in keeping with ornamental work of the adjacent store fronts.

Lighting is provided for the interior by means of standard ceiling fixtures with metal shades, and at the end, fronting traffic, a red warning light is attached to the column.

The job was authorized Dec. 27, 1924. The plans were prepared, foundations installed and contracts placed by the Department of Street Railways' forces. The structural steel frame was erected Jan. 15, 1925, and by Jan. 20 the roof, sash and glass were in place and the foundation work completed. The ornamental iron work required more time to prepare and install, but use of the structure was made by Jan. 20.

In making use of the shelter, the operating division introduced an innovation by adopting a berthing system in handling the cars of the two lines using Woodward

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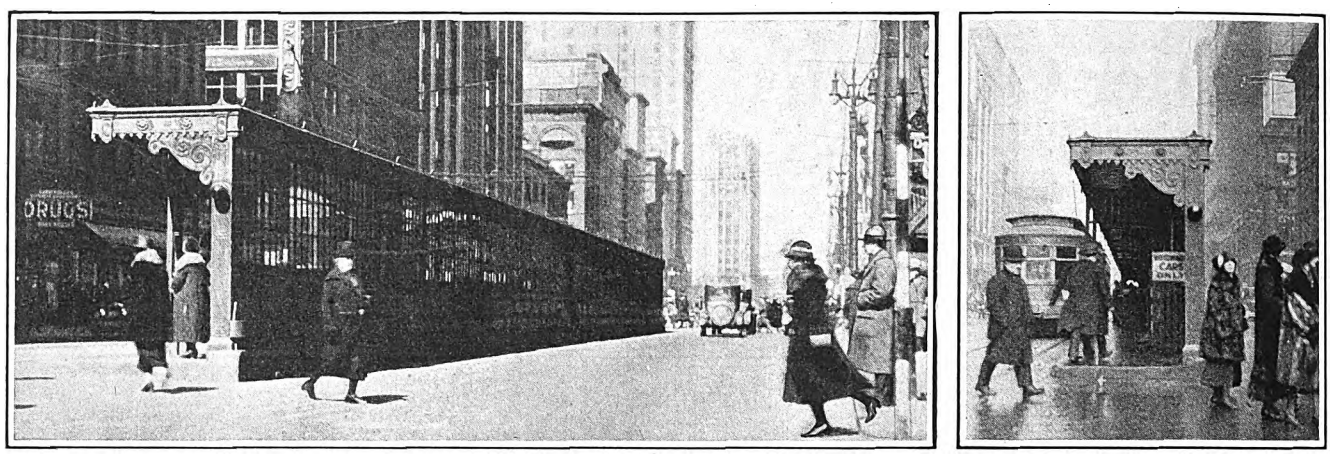


A Roof and One Side Have Been Erected Over an Island Platform

Avenue. To the Hamilton line, which accommodates the lesser number of passengers, the northern third of the structure is assigned. Interurban cars also stop here. The Woodward line uses the remaining two-thirds. Instructions were issued that all cars were to stop for passengers only at these designated points, rather than to attempt to come as near the corner as possible, as had been the case previously. Signs were erected to advise passengers where to expect the cars. This berthing system has worked out very advantageously in the movement of cars and will be adopted for similar situations in the central district.

The Hamilton line is equipped with Peter Witt cars, while the Woodward line has motor cars and trailers. To expedite traffic, the shelter was adapted as a prepayment station in so far as the Woodward line only is concerned. Standard fare boxes were placed at the entrances and a barrier, with similar entrance, was erected between the Woodward line zone and the Hamilton zone. As the front of the shelter is open, provision had to be made to prevent persons crossing the tracks into the prepayment zone. This was accomplished by a number of standard portable traffic signs, which were placed on the far side of the tracks and loosely connected with a manila rope. This prepayment is in use only during rush hours and has resulted in considerably more speed in loading.

A word might be said about general traffic conditions in the street in connection with the shelter. Formerly there was a motor bus and jitney stop in this block opposite the southern end of the structure. This has been moved one block to the north, thus freeing the curb of these parked vehicles. Automobile traffic now moves past the shelter more easily than it passed the former safety zone, and the Police Department advises that conditions have been improved by the changes.

There was some question about the ability of the car riders to reach the shelter as easily as they had reached the zone. It has been demonstrated that there is no additional trouble to use the shelter, and as the system of berthing cars mentioned above prevents confusion within the structure, the general effect is to expedite movement of traffic in every way.

Increasing Volume of Utility Financing

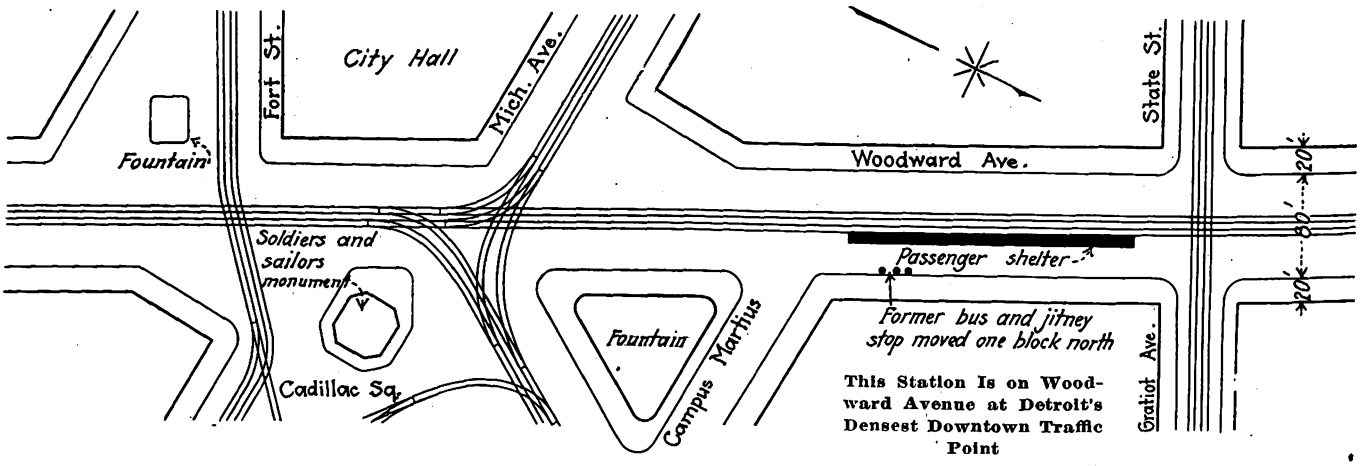
ACCORDING to statistics recently compiled by the Institute for Research in Land Economics and Public Utilities, Madison, Wis., the total volume of new public utility security issues is constantly increasing. During 1924, as reported in the *Commercial & Financial Chronicle*, it exceeded a billion and a half dollars and constituted 40 per cent of all corporate financing. In this calculation, the financing of the steam railroads is not included among the public service issues.

The figures for the five years preceding 1924 are given in the accompanying table.

TOTAL NEW ISSUES OF PUBLIC UTILITIES*

Year	Amount	Per Cent of All Corporate Financing
1923	$1,138,396,158	35
1922	975,136,745	32
1921	671,085,220	28
1920	496,822,550	17
1919	462,271,650	17

* Exclusive of steam railroads.



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Trolley That Meets All Trains

IN THE Beaver Valley of Pennsylvania a familiar fable has been brought to pass in real life. The passenger traffic of the Beaver Valley Traction Company consists to an appreciable extent of people coming from the railroad stations. If good connections are made between the street cars and the arriving railroad trains, the railway secures more riding than would be the case if these connections were not carefully made. For that reason a card has been prepared to aid the trainmen. This shows the times of trains and car trips. Operators are instructed to wait at the railroad station one minute when on schedule time, in order to make train connections. Regardless of schedule, however, cars will wait for a train if it is at the station or if the train is apparently about to arrive. Of course, it is not possible to so schedule the cars that every train is met, but the use of these cards has resulted in making more connections than would be the case otherwise.

BEAVER VALLEY TRACTION CO.

ROUTE NO._____ RUN NO._____

TIME OF TRAIN CONNECTIONS

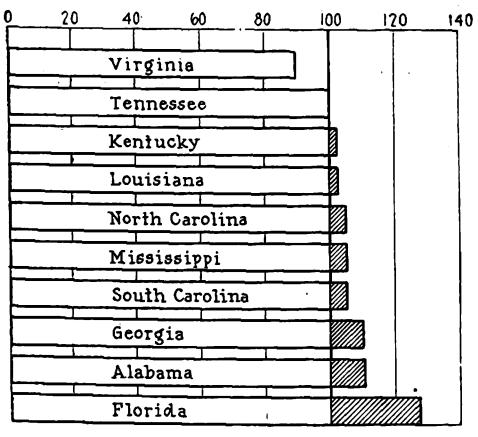
Time Train	Time Car	Railroad	Location	Direction

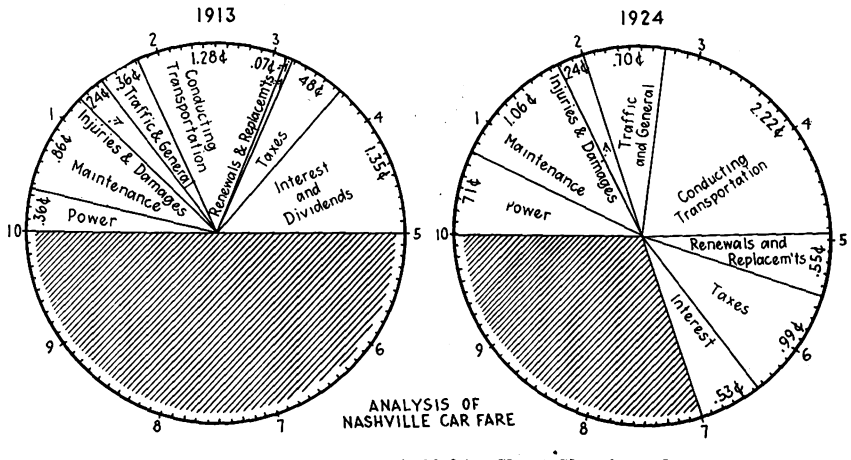
This Small Card Can Readily Be Referred To by the Car Operator to Make Connection with Train

Electric Railway Statistics in Southern States Compared

SOME statistics on electric railway fares in Tennessee and other Southern states have recently been compiled in graphical form by the engineering department of the Railroad and Public Utility Commission of Tennessee. Three of these graphs are presented in the accompanying charts. The first shows on a percentage basis the local car fares in ten Southern states, as of Jan. 1, 1925, the Tennessee average fare of 6.66 cents being taken as 100 per cent. The average fares for each state were obtained by weighting the fares in each case according to the population served.

The two charts to the right show an analysis of the expenditures made from the Nashville fare in 1913 and in 1924. The usual method of dividing a circle according to accounts is followed, but the entire area of the circle represents 10 cents in each case and the shaded portion that portion of 10 cents which is returned to the passenger when a dime is tendered for fare. The fare in 1913 was 5 cents and in 1924 was 7 cents. The only account which has remained the same is "injuries and damages" at 0.24 cent. The greatest increase that has occurred is in the item of taxes, which have more than doubled.





At Left—Weighted Average Electric Railway City Fare in Ten Southern States. At Right—Chart Showing Changes in the Divisions of the Fare in Nashville Between 1913 and 1924

Financing Rapid Transit Extensions in Hamburg

An Increase in the Rate of Fare Would Be Applied Partly to Defray Increased Operating Costs and Partly to the Construction of New Lines

BY WILHELM STEIN
Managing Director Hamburg Elevated Railway, Hamburg, Germany

THE elevated railway company of Hamburg, Germany, which operates the elevated and subway lines (78 track-miles), all the surface lines (250 track-miles), the Alster River boat lines and the autobuses, is an example of management with dual control. It is a stock company in which the state of Hamburg is interested through capital investment and through participation in the management.

In the year 1924 there were carried in all 316,000,000 passengers. Up to the present time fares have been very low, not above the level of 1913. A zone system is in effect, the rates being from 10 to 20 pfennigs, depending on the length of ride. Most of the passengers ride for the lowest fare, the average revenue per passenger being 11.3 pfennigs. The pay of the men has risen considerably, and along with the shortening of the working hours the cost per hour is now 85 per cent greater than it was in 1913. Moreover, materials cost more and taxes are nearly twelve times as high as before the war. So today the existing tariff does not produce sufficient revenue. Only by severe crowding of the cars, particularly during the hours of maximum travel, has it been possible to meet operating expenses.

The lack of housing facilities, together with compulsory methods of housing introduced since the war, have kept the population from changing their residences in accord with changes in places of employment. On this account there will be a loss of many riders if changed conditions permit a freer choice in places of residence. However, traffic is constantly increasing,

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while the company is unable to care for it with the necessary facilities. The street railways are also contending with increased street congestion. Relief can be obtained only through the construction of new subways. In this respect Hamburg does not differ from other large cities of the world.

Obtaining Capital from Fares

Raising money for the construction of new subways through the issue of capital stocks or bonds is rendered the more difficult in that for the new lines the meeting of interest payments from operations cannot be guaranteed under present conditions. Neither is the state in a position to raise the necessary capital. The company has therefore proposed to obtain the necessary money out of operations through a continuing increase in fares. For this purpose the rate of fare will have to be raised about 5 pfennigs. Of this increase the company would retain 2 pfennigs to cover increased operating costs, while 3 pfennigs would be placed to the credit of the state. The state would pledge itself to return this amount to the company for the purchase of new capital stock at the rate of 200 per cent. The money so collected would be applied to the construction of new rapid transit lines, but the capital of the undertaking would be charged with only half the dividends otherwise due. The contribution of 3 pfennigs can later be diminished, or the fare can later be increased, if the rate proposed now does not suffice. The whole suggested agreement is revocable, so that the proposed method of financing can be replaced later by customary methods.

The state of Hamburg has not yet given its formal consent to this proposition, which has been put forward as necessary in order to get public opinion accustomed to the modern idea that the riders themselves must contribute to the extension of the train service, and that on account of the lack of fluid capital, which is an aftermath of the war, new capital can best be obtained from savings. It is confidently expected that the state will in a short time accept the proposition of the company, so that new railway construction may be started.

In other respects the proposed plan for raising money corresponds basically to the methods followed in various countries by means of which new streets have been obtained for automobile traffic. In these, by means of taxation and assessments on the users of the vehicles, funds for road construction have been built up. There is no reason why this same method cannot be used for railway construction. It is especially adapted to those cities where a single rate of fare can be collected by the use of automatic ticket machines, as in subways.

Blue Envelopes for Commendation

MOST railways have found the public more ready to send in criticisms of the service and of acts of the trainmen than to transmit commendations of either, when some especially meritorious acts come before their attention. To encourage the latter kind of communication, the Department of Street Railways, Detroit, has been carrying posters in its cars asking passengers to advise the management regarding especially meritorious service by the employees, as well as objectionable practices. Such information, it says, will help to improve the service. The department also issued a bulletin to its employees on the subject on the first of April this year. This bulletin reads in part as follows:

A Blue Envelope Means a Commendation for You

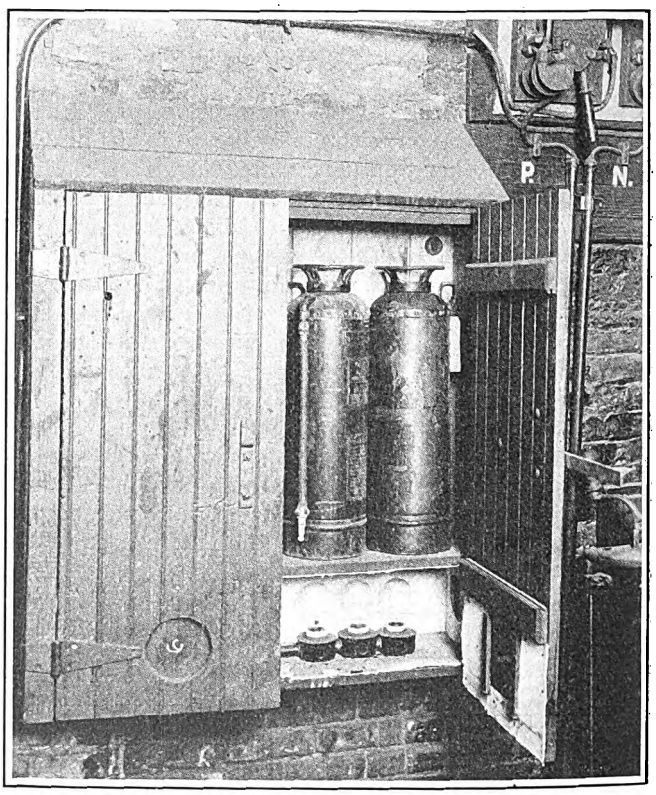
Our patrons are continually calling our attention to the thorough manner in which a motorman or conductor performs his duties, such as waiting for them to get to and board the car before proceeding, clearly announcing all streets, etc., or performing a special act of courtesy, particularly in the case of a cripple, or someone who is handicapped in some manner. The two pages of commendations in the March "Co-operator" show the extent to which these things are appreciated.

Hereafter when a letter of comemndation is being forwarded to the division superintendent to be noted by an employee, a notice to that effect will be sent from this office in a blue envelope addressed to the employee involved.

Housing for Fire Extinguishers

FIRE EXTINGUISHERS have been given effective protection against freezing in the 155th Street shop of the Eighth Avenue Railroad, New York, by providing a housing which is heated by lamps. The housing is approximately 3 ft. square by 18 in. deep and provides space for holding four fire extinguishers. A shelf is provided about 8 in. above the bottom. The fire extinguishers stand on this, the space below the shelf being utilized as a compartment for five lamps. This compartment is lined with Transite.

The location of fire extinguishers is indicated in the Eighth Avenue shop by providing red glasses,



Housing for Fire Extinguishers with Lamp Circuit Provided to Keep Extinguishers from Freezing

through which the rays from the lamps inside the housing shine. Each door of the cabinet has a 4-in. diameter hole, with a red glass inside. Two 3-in. holes with similar red glasses are provided in the end. The heat from the lamps is sufficient to keep the extinguisher from freezing during the most severe weather.

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Examining and Teaching Platform Men

Applicants for Positions as Trainmen on the Denver Tramway Are Given Complete Course of Instruction and Are Kept on Probation for 90 Days—Brass Plate Indicates Each Man's Name to Passengers—All Trainmen Called for Additional Instruction Twice Each Year

REALIZING the importance of maintaining cordial relations between the traveling public and its platform employees, the Denver Tramway not only selects and trains its new men with extreme care but also follows up the original instruction by calling each platform employee to the instruction department semi-annually for a review of the rules and practices. New operating problems are also discussed at that time.

The work of selection and training of new men is handled by an instruction department under the direct supervision of the superintendent of transportation. When a man applies for work on the cars he is given an application blank to fill out in his own handwriting, and, with this as a guide, is interviewed by the superintendent of employment to determine his fitness for the job. The application is then indexed and filed by class until such time as new men are required.

When openings occur, applicants are selected from the eligible list and the men are called for interview. As each man reports, the job is explained to him in detail by the chief instructor and he is given to understand exactly the nature of the work expected and the cost of entering the service. If the conditions of employment are satisfactory to the man, he is then sent to the assistant superintendent of transportation with his application form and a note from the chief instructor. Here he is again interviewed. If found satisfactory, he is sent back to the chief instructor and the process of actual employment starts. At this time a form, shown in an accompanying illustration, is started, and subsequently becomes a complete record.

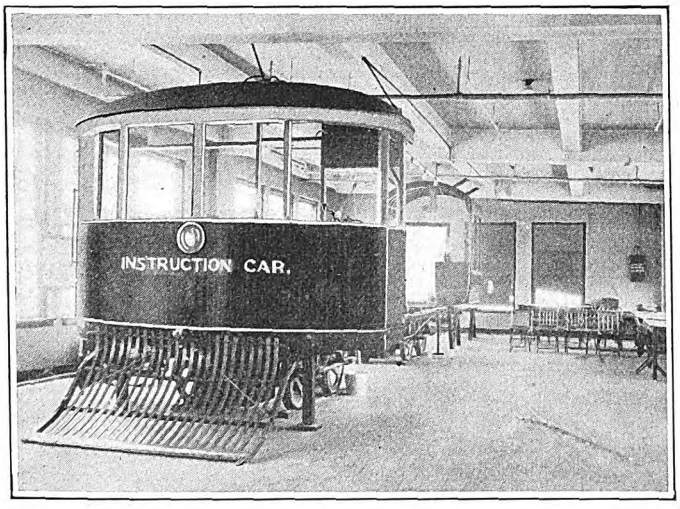
The applicant is next sent to the doctor and to the photographer, for a physical examination and photograph. If passed by the doctor, he is sent to the company tailor to place his order for a uniform. In addition, conductors are required to supply themselves with a trip sheet book and a change carrier. Before proceeding further with the instruction of the applicant a $5 good faith deposit is required from him, with the understanding that this will be forfeited if he fails to qualify or declines to take the position after the training is completed. This deposit is returned later when the applicant has progressed to a certain stage in his preliminary work. Conductors are also required to pay the premium on a surety bond.

At this time also the candidate makes application for membership in the Hospital Association, which entitles him to free medical service when sick. For maintenance of this hospital fund 5 cents per month is deducted from each man's pay. Any deficiency in the fund in excess of the amount so collected from employees is made up out of the treasury of the company.

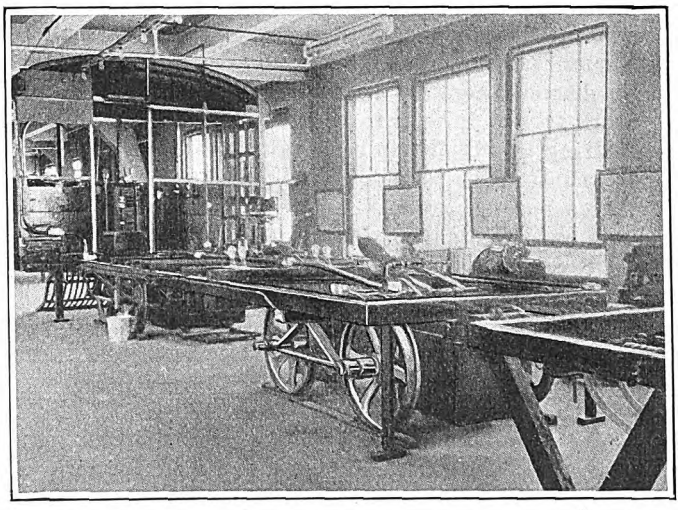
Candidates for positions also make application at this time for disability benefits under a group insurance plan which has been worked out by the employees' representative committee. A blanket policy is carried, which gives each man the benefit of the reduced rate resulting from the group plan. Premiums in accordance with the amount of insurance applied for are paid by the individual, and each trainman is limited to a total insurance amounting to $25 per week disability benefit, or $2,500 in the event of accidental death.

After these preliminaries are completed the applicant is supplied with the company book of rules, street directory, street guide, badge and preliminary examination questions. An order is then made out authorizing the beginning of road instruction, and the man is directed to the superintendent of the division where he ultimately will be assigned. The period of this road instruction varies with the aptitude of the applicant, but is not less than 90 hours for standard trainmen and 72 hours for trailer conductors.

Road instructors are selected from the older employees who have high efficiency standings, and these men are given special training in handling new applicants on the cars. They are brought into the instruc-



This General View of the Denver Instruction Room Shows the Facilities that Are Available for Training Students



The Instruction Car Is Equipped with Various Types of Apparatus Used on the Property

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tion department at intervals of 90 days and the procedure for breaking in students is gone over with each one of them carefully. During actual work as instructors they are paid 50 cents a shift extra, but the amount paid for the training of any one student is limited to $5. At any time within 90 days after the breaking-in period a student has the right to go back and ride with his teacher for additional instruction. The student is paid $1 per shift while breaking in, but this compensation is limited to a total of $10 regardless of how long he is held by the instructor before release. The record of instruction, together with final approval of the student, is made out on the form shown in an accompanying illustration, and the applicant is again returned to the instructor. At this time the accident blank is carefully explained to him.

WRITTEN EXAMINATIONS REQUIRED

In the meantime, the student, who was previously supplied with a set of preliminary questions and their answers arranged in catechism form, is expected to have studied them carefully and is now called upon to write his preliminary examination. He also makes out a fictitious accident report, to make sure that he thoroughly understands how to handle the form. After this, he makes a trial trip in charge of a conductor or motorman road inspector. He is allowed to operate the car to demonstrate that he is thoroughly qualified for the work to which he is to be assigned. If he fails to pass during this trial trip he is returned to his original platform instructor for additional training. If he fails to make a passing grade (90 per cent) on his written preliminary examination he is required to give the questions additional study and must then come back to write the examination over again.

After the student has satisfactorily passed both tests his good faith deposit is returned to him and he is sent to the office of the superintendent of transportation to be placed on record as entering the service. In this record the new man is retained on a probation list for 90 days, at the end of which time the division superintendent in charge of the division to which he is assigned determines whether he is to go on the regular extra list for that division or is to be dropped from the service for incompetency. At this time the student is supplied with the final examination questions and answers and is allowed 25 days in which to report to the instruction department to write this examination.

During the probationary period of 90 days the new man is closely followed up. A road instructor rides with him at least once a week, watching his operation and giving him verbal instructions or pointing out mistakes or errors in his method of operating the car or handling his passengers.

Each new man is supplied with a nameplate before reporting for duty. This is a small brass plate with black letters about ⅜ in. high and is issued to both motormen and conductors. A frame on the fare box is provided, into which each man slips his plate when he takes his place on the car. In this way the names of both conductor and motorman in charge of the car are always in view of passengers. It is felt that this practice tends to identify the trainmen personally and to put them on a little more friendly footing with the passengers who ride a given line regularly.

In the meantime, the man's photograph has been received and references have been written to former employers and others indicated on his application blank.

Date Employed ..... 192..

Name.....Mot.....Age .....

Address .....Con.....O.K.'d by.....

Tel. .....Tr. C.....School .....

Photographed .....Physically examined .....

Cap .....Uniform..... Changer.....

Bond .....Deposit... Breaking-in order....

SUPPLIES { Cap Badge..... Cap Band..... St. Guide.....
Red Rule Bk..... L. L. R. Bk..... Exam. Ques.....

INSTRUCTORS { On Standard Car.....Days.....Pay.....
On Safety Car.....Days.....Pay.....

Examination .....Trial Trip.....Date Comp.....

Watch .....Tools .....House .....

Remarks .....

A Full Record of the Student's Road Instruction Is Compiled by Trainman Teacher

THE DENVER TRAMWAY COMPANY

BREAKING-IN ORDER—RETURNABLE IN ..... DAYS.

..... Tr. / Con. / Mot. .....192.. Date ..... Division

..... Supt. Transpt. ..... Division Supt. ..... Instructor

..... Standard Car Instructor ..... Safety Car Instructor

Inst. not less than ..... hours. Inst. not less than ..... hours.

Date

Hrs.

Route No.	No. Hours	Instr. Badge	Route No.	No. Hours	Instr. Badge	Route No.	No. Hours	Instr. Badge
2	.....	.....	13	.....	.....	50	.....	.....
3	.....	.....	14	.....	.....	58	.....	.....
4	.....	.....	15	.....	.....	61	.....	.....
5	.....	.....	20	.....	.....	64	.....	.....
6	.....	.....	23	.....	.....	66	.....	.....
7	.....	.....	28	.....	.....	72	.....	.....
8	.....	.....	29	.....	.....	74	.....	.....
9	.....	.....	37	.....	.....	75	.....	.....
10	.....	.....	38	.....	.....	82	.....	.....
11	.....	.....	39	.....	.....	83	.....	.....
12	.....	.....	40	.....	.....	84	.....	.....

Trainman Instructor: Instruct student on such of following things as may apply to his future work, placing your badge number after each item when student understands it.

MOTORMAN	CONDUCTOR
Picking up trailer.....——	Picking up trailer.....——
Dropping trailer .....——	Dropping trailer .....——
Taking car out of house.....——	Taking car out of house.....——
Putting car in house.....——	Putting car in house.....——
Location relief points.....——	Location relief points.....——
Picking up trolley .....——	Picking up trolley .....——
Learn rules 111 to 149.....——	Learn rules 79 to 110.....——
Emergency application .....——	Pull emergency cord.....——
Motor regeneration stop.....——	Division transfer points.....——
Fill in all reports used.....——	Fill in all reports used.....——
Location of all switches and fuses .....——	Major-minor trip streets on alternating lines .....——

To insure prompt payment of trainman teacher it is important that above spaces be filled in completely. (Make any necessary remarks on other side of this order.)

I have fully instructed student on above routes and duties opposite which I have placed my badge number.

..... Standard Car Instructor ..... Safety Car Instructor

Progress Made by New Employees Is Recorded on This Form

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If for any reason the man's previous record seems to be unsatisfactory he is dropped at any stage of the instruction period. Assuming that his history and references are satisfactory, however, he is now a regular member of the extra list in the division to which he has been assigned. A full record has been kept of his progress. All reports by instructors and inspectors are kept in the personal record file of the man, which is maintained in the transportation department. From this point on, as his period of service increases, and as various reports come in regarding his performance from time to time, this personal record is maintained and soon becomes a complete source of information regarding his efficiency and past record at any time that such information may be required by the transportation department.

Called for Instruction Every Six Months

At this stage the man's instruction is far from complete. Although he is expected to be fully trained in operating his car and to be entirely familiar with the rules and practices of the company, it is believed that these men as well as older employees must be carefully followed up and supervised if the service is to be maintained at maximum efficiency. All new men entering the service during a six months period are classed together and are called in to the instruction department for such additional instruction as may be decided upon from time to time. A list of more advanced questions regarding details of the service and proper treatment of passengers, action to be taken in emergencies and methods of reducing accidents in service is taken up and discussed at this time. These subjects are all presented in the form of questions and the man is then required to write another examination covering the subjects taken up. Any new operating questions which have come up during the six-month period are also discussed with these new men, so that they may be entirely familiar with changes or developments in the company's practice.

Old employees are likewise given additional instruction and required to take part in discussions of general operating problems at intervals of six months. With old employees this is made a semi-annual campaign extending over a period of approximately two weeks, during which all trainmen are called in to the instruction department at staggered hours to take part in this work. Safety, courtesy, relations with the public and proper handling of equipment are the main subjects touched on during these instruction meetings. For the purpose of making sure that all men are entirely familiar with the car equipment, a skeleton car, shown in an accompanying illustration, has been erected in the instruction room. All of the more important items of equipment are arranged on this car so that they are readily demonstrated. This instruction car contains several types of controllers, fully connected up with lights to indicate the operation of the motors, and is equipped with air brakes and interlocking door control.

These semi-annual instruction periods give an excellent opportunity for familiarizing all trainmen with any new items of equipment which have been adopted for cars during the period. Each man is required to pass an examination on the subject covered and is held out of service until this examination is satisfactorily passed. As in the case of the preliminary and final examinations for students, a passing grade of 90 per cent is required.

Traffic in New York City Terminals

THE traffic in and out of the Hudson Terminal of the Hudson & Manhattan Railroad was the largest of any of the suburban terminals in New York during 1924. This terminal is fed by a two-track line, but has a number of loading and unloading platforms. The traffic in and out of the Flatbush terminal of the Long Island Railroad was the largest of any of the trunk line terminals. This also is served by a two-track line. Figures for all of the railroad terminals follow:

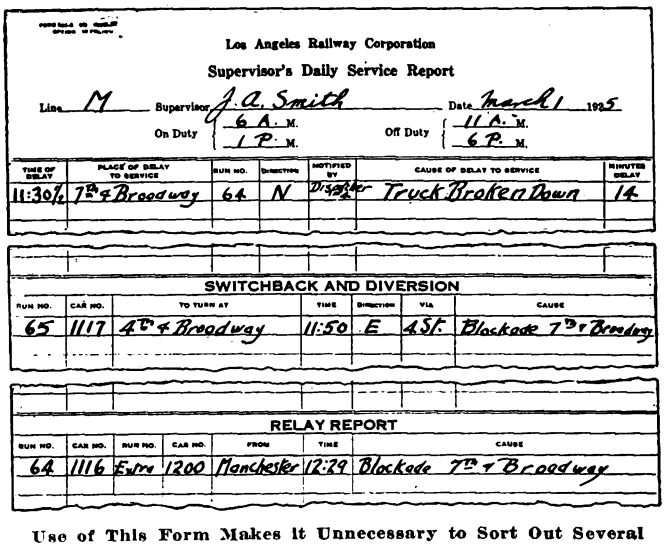
TRAFFIC IN PASSENGERS DURING 1924 AT RAILROAD TERMINALS IN NEW YORK CITY

Pennsylvania Station:	
Pennsylvania Railroad	10,171,157
Long Island Railroad	32,898,590
Baltimore & Ohio Railroad	550,000
Lehigh Valley Railroad	495,263
New York, New Haven & Hartford Railroad	505,301
Total Pennsylvania Station	44,620,311
Grand Central:	
New York Central Railroad	22,439,299
New York, New Haven & Hartford Railroad	17,738,914
Total Grand Central	40,178,213
Hudson & Manhattan:	
Cortlandt Street	66,192,941
Uptown stations	37,496,357
Long Island Railroad:	
Flatbush Avenue station	40,915,057
Long Island City	1,187,240
Woodside	2,575,000
Jamaica (including Union Hall Street station)	3,210,000
East New York	1,500,000
Staten Island Rapid Transit Railway:	
St. George Terminal	11,828,314

Of the railroads delivering passengers in New York by direct entrance or by ferry or Hudson & Manhattan tube the Long Island Railroad led with 75,000,887 in and out. The Pennsylvania came next with 40,456,529. The four following were: Erie, 32,043,150; New York Central, 31,717,518; Lackawanna, 22,359,818; New Haven, 18,339,242.

Combined Service Report Used in Los Angeles

A NEW standard form for reporting delays to service, switchbacks, diversions and relays has been adopted by the Los Angeles Railway. This is intended to give, in segregated form, all essential information



Los Angeles Railway Corporation

Supervisor's Daily Service Report

Line M Supervisor J. A. Smith Date March 1 1925

On Duty 6 A. M. / 1 P. M. Off Duty 11 A. M. / 6 P. M.

Time of Delay	Place of Delay to Service	Run No.	Direction	Notified by	Cause of Delay to Service	Minutes Delay
11:30	7th & Broadway	64	N	Dispatcher	Truck Broken Down	14

SWITCHBACK AND DIVERSION

Run No.	Car No.	To Turn At	Time	Direction	Via	Cause
65	1117	4th & Broadway	11:50	E	4 St.	Blockade 7th & Broadway

RELAY REPORT

Run No.	Car No.	Run No.	Car No.	From	Time	Cause
64	1116	Extra	1200	Manchester	12:29	Blockade 7th & Broadway

Use of This Form Makes It Unnecessary to Sort Out Several

regarding a day's operation. The reports are prepared by the line supervisors, and combining these data on one form eliminates necessity of sorting a number of miscellaneous reports, as was necessary heretofore.

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Association News & Discussions

Wisconsin Association Holds Annual Meeting

The Program Covered General Utility Subjects, Including Public Relations, Regulation and Financing—An Effort to Dig Into the Fundamentals Characterized the Discussion

DISCUSSION of some specific phases of public relations, regulation, education and financing occupied the attention of 300 members of the Wisconsin Utilities Association during a well-filled one-day session comprising its annual meeting, which was held at the Hotel Pfister in Milwaukee on April 16. Even with so full a business program, time was found during the annual dinner held in the evening for an illuminating address on "Our Federal Constitution" by H. F. Atwood, president Constitution Anniversary Association, Chicago. A delightful entertainment program was arranged by Chairman B. W. Arnold and general dancing followed the dinner.

Although the meeting was devoted almost entirely to a discussion of more or less general subjects of interest to utility men, the program was characterized by a marked effort to avoid indulgence in generalities, and there was a tendency "to get down to cases" in the consideration of each subject.

In his annual address President G. C. Neff explained that the association program during the year had been formulated with a view to covering technical subjects at the individual section meetings, of which there were five during the year. By this plan, he said, it was possible to devote the annual convention meeting to a discussion of the broader problems of interest to the entire industry.

New Association Services

A number of steps taken during the year to increase the value of the association to its membership were outlined by Mr. Neff. These included the starting of a monthly association bulletin and arrangements for the support of additional fellowships at the state university to stimulate utility research work. This now includes a railway fellowship, which is producing a research on track and paving design. Letters and bulletins have been used to advise members of pending bills in the Legislature on public utility matters. Mr. Neff pointed out the importance of individual company officials keeping in touch with their respective legislators to keep them supplied with authentic information relative to proposed measures introduced in the Legislature. He maintained that there are many reasons for looking with optimism on the results accomplished by the utility industry. He said that utilities are leading all other industries in bridging the gap between capital and labor through the sale of securities to employees. Other industries are now following this example. Sale of securities to the general public, through employee salesmen, has resulted in the distribution of these securities to approximately 180,000 investors in Wisconsin. Extension of electric power to rural districts, Mr. Neff said, promises to revolutionize farm life. As an example of improved public relations and better mutual understanding, he pointed out that not a single utility in Wisconsin has taken a case into the courts for a higher rate during the year.

Legal Phases of Regulation

L. E. Gettle, chairman Railroad Commission of Wisconsin, presented a paper on "Some Legal Phases of Regulation in Wisconsin." Under this subject he discussed a number of cases recently decided by the Supreme Court of the state, which raise important questions regarding the power and jurisdiction of the commission in the regulation of public utilities. Among several cases discussed by Mr. Gettle was included "State vs. Washburn Water Works Company," 182 Wisconsin 287. The decision in this case raises a question of the power of the commission to order extensions of service of utilities within cities, without the prior action of the municipal authorities.

Another question raised by a recent decision relative to an order of the commission regarding track extensions in the city of Madison involves the right of the commission to place conditions and reservations in its orders. In this case, a decision on the application of various individuals and associations in the city of Madison for an order directing the Madison Railway to extend its service on Monroe Street included an order of extension conditional on the city relieving the company of the necessity of paving. The commission, in considering the case, was of the opinion that unless the street railway was relieved of the burden of paving, except such paving as was necessary because of the presence of the tracks in the street, the extension could not be ordered. The court decided against the right of the commission to issue a conditional order of this kind and took the position that such an order must be based entirely upon the facts presented.

In discussing this decision, Mr. Gettle argued that it is not good business nor good law for the commission to be prohibited from looking to the future, and building with reference to conditions which are reasonably likely to occur, when shaping its orders. In the case under discussion, he said that the commission found that the cost would not be excessive to the street railway company if it were relieved of the paving burden. In other words, in order to obtain the extension the city, which was in fact one of the applicants for the extension, was required in some form or other to contribute to its cost an amount which would equal the cost of the paving of which the company was relieved.

Utilities Are Natural Monopolies

Mr. Gettle said that in general practice this cost would have been met by special assessments levied against the owners of the property abutting on the street. In any event, he held that the principle was not in any sense different from that which is constantly being recognized by the courts and commission that extensions of service under certain conditions must to some extent be financed by contributions from consumers for whose benefit the service is extended. He explained that the commission, in general, has fostered the adoption of definite extension rules by various utility companies to the end that discrimination in such extensions might be eliminated, but added that where such rules were not in effect, and extensions were desired, the commission has uniformly designated the rules under which the extension should be made. Frequently this involves an investment on the part of the petitioner in the form of a contribution.

T. D. Crocker, Northern States Power Company, Minneapolis, likewise reduced his discussion of public relations to an analysis of specific elements of the subject. He showed that the utility business is fundamentally monopolistic in character and that this very condition is in itself a potential cause of suspicion and irritation. Although the average American citizen is allowed a choice of the location of his home, the contractor who erects it, the workmen who are employed, the stores in which he trades, and most of the other facilities which he requires, there is no option but to obtain utility service—gas, electric and transportation—from the utility company which enjoys a monopoly in that section. Consequently, he held that the maintenance of favorable public relations is dependent upon a clear understanding of this condition and an appreciation by the management of the extreme importance of overcoming the natural tendency toward irritation at this restriction. For this reason, Mr. Crocker maintained that the contacts which the consumer makes with the utility organ-

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ization are of even more importance from the standpoint of building good or bad public relations than in the case of a competitive business. Success in building friends in the community, he said, depends almost entirely on the effect of the contacts which the individual consumers make with employees of the company. A friendly public feeling can be built up only when the employees are enthusiastic about the utility company by which they are employed. When they have confidence in the management and feel that the company has an interest in each man's welfare, each employee is watching for every opportunity to help the company and will go out of his way to do something that will make a friend.

Here—in the employees who directly come in contact with the utilities' customers — lies the mainspring from which public good will grows. Mr. Crocker said that the public knows a company, not by the spectacular things it does, but by these daily, personal contacts that either please or irritate. A tactless, disgruntled clerk, trainman or troubleman can arouse more resentment than the general manager can counteract. Mr. Crocker expressed a conviction that the American public in general is fair, and that it will meet fair tactics in the same spirit in which they are offered. The illusive "public" which is being considered so much by the utility men these days, he said, is simply made up of a collection of the individuals who come into contact with the utilities' service. The public attitude toward the company is the net result of the impressions left with these individuals from day to day. He emphasized the importance of eliminating incipient cases of dissatisfaction and urged that every effort be expended to cultivate personal contact with consumers and to encourage criticism where this divulges any apparently insignificant sources of antagonism that may result in ultimate dissatisfaction. He concluded by advocating constant alertness on the subject of building a humanized or personalized conception of the company.

University Utility Courses

R. E. Heilman, dean of the School of Commerce, Northwestern University, outlined the widespread progress being made by the universities of the country in conducting public utilities business courses. He also said that this has resulted in the beginning of utility research work in some of the important universities of the country. Such work in progress at the present time includes the following:

Harvard University—a series of case books on utility management, being prepared by actual investigation of management methods in use at the present time; University of Illinois—an elaborate investigation of the result of municipal ownership and operation of utility enterprises in Illinois; Northwestern University—research work on public utility accounting and financing; Wisconsin University—the research being carried on by the Institute of Public Utilities and Land Economics.

Recent developments in public utility financing were discussed by G. E. Frazer of Chicago. He showed that the sale of preferred stock by utility companies has been the means of building a saving habit on the part of many people who previously had never made a practice of regularly saving their surplus funds. He explained, however, that this activity is in general limited to the large holding companies and indicated that the smaller independent companies have not availed themselves of this opportunity of building confidence. Several tendencies in utility financing, resulting from the widespread distribution of the securities, were indicated by Mr. Frazer. One such tendency is the simplification of trust deeds due to the difficulty of calling in outstanding securities for the purpose of making revisions.

Mr. Frazer pointed out that every person who buys a share of utility preferred stock is giving a vote of confidence to the management. He said that there is some feeling that utilities are going into a great many different pockets in their financing and that this imposes a heavy responsibility on those charged with managing the enterprises. Widespread distribution of securities in the hands of the public has resulted in increased attention being given to the control of finances. This is resulting in greater control of capital expenditure and has developed the use of continuous budgets and monthly or weekly meetings of finance committees instead of the single annual meeting, as was the practice when an inflexible annual budget was used for controlling expenditures. He said that there has been an almost revolutionary advance in the control of financing, which has resulted in bringing the board of directors into closer relation with the actual management of the company. This development has been in the direction of giving closer control and more accurate forecasts of cash requirements. He summarized the modern tendency by saying that the increasing sale of securities to large numbers of the consuming public has developed a realization of the need for impersonal control of the money derived from such securities. This continuous budget, he maintained, is a decided advance in this direction.

Various committee reports were presented during the meeting and the following officers were elected for the ensuing year: President, George H. Wilmarth; vice-president, W. C. Butterworth; treasurer, H. A. Smith.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 5-8—Southwestern Public Service Association, Rice Hotel, Houston, Tex.

May 8—Metropolitan Section, A.E.R.A., Engineering Societies Building, New York, 8 P. M.

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 26-27—Regional Motor Transport Conference, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Advisory Committee on Waste

THE first step in a campaign to give impetus to the united industrial effort against waste and for the quickening of trade is the formation of a committee of five first-line executives, to act as an advisory body to the American Engineering Standards Committee. This advisory committee will consist of J. A. Farrell, president United States Steel Corporation; G. B. Cortelyou, president Consolidated Gas Company, New York; J. W. Lieb, vice-president New York Edison Company; L. F. Loree, president Delaware & Hudson Company, and Gerard Swope, president General Electric Company.

The committee will emphasize what is regarded as the fundamental principle of standardization: that standardizing must facilitate and stimulate, and not hinder industry. It will assist in keeping executives in touch with the national movement in its development, in extending its influence and support among industrial groups, and in bringing about the fullest co-operation along right lines between industry and government in standardization work, and particularly in the solution of the problem of industrial waste, into which Secretary Hoover has thrown the resources of the Department of Commerce.

Southwestern Association Program

MANY papers of interest to electric railway men will be presented at the annual meeting of the Southwestern Public Service Association to be held at the Rice Hotel, Houston, Tex., on May 5-8. Registration will take place at 9 a.m., Tuesday, May 5. A luncheon for the executive committee will be given at 12:15, followed by a general session at 2 o'clock. The reception and ball will be held the same evening at 8 o'clock. General sessions and meetings of the various sections will be held the next three days, with excursions Thursday afternoon.

Among the papers presented at the general meeting on Wednesday will be one by Gen. Guy E. Tripp, chairman of the board, Westinghouse Electric & Manufacturing Company, on "The

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Future of National Electric Service," and one by President J. N. Shannahan of the American Electric Railway Association on "Electric Railways—a Growing Necessity." Of the papers on Thursday, "More Mass Transportation" by W. E. Wood, manager Houston Electric Company, is of particular interest to railway men.

Following is the program of the railway section, which will be presided over by Mr. Wood, chairman:

RAILWAY SECTION

Wednesday, May 6, Beginning 2 p.m.

"Our Transportation Problems in Houston," by C. J. Kirk, Houston, Supervisor of Utilities, City of Houston.

"Use of Labor Saving Tools on Track Maintenance," by E. S. Myers, New Orleans, assistant to vice-president New Orleans Public Service, Inc.

"Electric Railway Associations—Relation of Regional to National."

"The Why, When, and What of Publicity," by H. B. Hearn, Shreveport, president Shreveport Railways.

Thursday, May 7, Beginning 9 a.m.

"The Use of Buses in City Service," by W. B. Tuttle, San Antonio, president San Antonio Public Service Company.

"Current Collecting Devices," by L. E. Delf, Fort Worth, electric engineer Northern Texas Traction Company, and George Tongue, Dallas, Dallas Railway.

"Construction and Operation of Rear Door Treadle Car in Dallas," by G. I. Plummer, Dallas superintendent of traffic, Dallas Railway.

Friday, May 8, Beginning 9 a.m.

"The Type of Street Car Which Will Be Specified in 1930," by V. W. Berry, Fort Worth, general superintendent Northern Texas Traction Company.

"The Classification of Accidents, and Its Effect on the Work of the Transportation and Claim Departments," by Alves Dixon, El Paso, superintendent of railways, El Paso Electric Railway.

Election of chairman.

Welded Rail Joints

A MEETING of the executive committee of the joint committee on welded rail joints was held at the Engineering Societies Building, New York City, on April 23. Present were E. M. T. Ryder, vice-chairman, who presided in the absence of Dr. Burgess, chairman; William Spraragen, secretary; R. C. Cram, C. F. Gailor, G. C. Hecker, J. C. Lincoln, H. M. Steward, A. P. Way, Jonathan Wolfe, H. L. Whittemore and W. W. Wysor.

The meeting was called primarily to discuss certain suggested modifications in the tentative program of future work of the committee as recently adopted at the Washington meeting of the main committee. The subjects of welding wire, number of specimens and various details were carefully studied and some modifications in plans and order of work were adopted, all tending to facilitate the work.

A number of appropriations were authorized covering purchase of materials for the arc weld joint tests, testing work at Lehigh University, secretarial expenses and office supplies.

The third progress report of the committee is in press and will be distributed to the membership shortly. The vice-chairman announced that the demonstration tests of the otheograph or "educated tie" will be made at the General Electric Company's test track at Erie, Pa., on May 6. It is expected that representatives of the Bureau of Standards and of the American Railway Engineering Association will be present. The purpose of this demonstration is to determine the value of the device for use in connection with the work of the committee on welded rail joints and of the committee on stresses in track of the American Railway Engineering Association, the American Society of Civil Engineers also being interested in the latter committee's work.

Town and Country Planning Conference

A CITY and regional planning conference, under the auspices of the International Federation for Town and Country Planning and Garden Cities and the National Conference on City Planning, was held this week at the Hotel Pennsylvania, New York. Frederick P. Kettel, president Carnegie Corporation, was chairman of the general committee, and papers and addresses were presented by European as well as by American delegates. The topics discussed included the traffic problem, typical city plans, planning unbuilt areas, better distribution of people and industries, the New York regional plan, and zoning in practice.

On Thursday there were several round-table luncheons, of which one, conducted by J. Rowland Bibbins, was on transportation. At this meeting, which was attended by about 50 delegates, the following resolution was adopted:

It is the sense of this traffic and transportation round table of the International City Planning Conference that the problem of traffic congestion and the development of adequate transport has become so involved that the approach to the solution thereto must now be broadened to comprehend all the passenger and freight agencies contributing to or affected by transport and traffic, the automobile, the bus, street railway and rapid transit, motor trucks, commercial delivery, railroad terminals and port traffic, industry, the pedestrian, and

That a traffic policy should be developed for early adoption (to be modified as time may require),

That such development should proceed in careful recognition of the many related factors involved,

That any traffic policy and plan should be an organic part of a comprehensive city plan,

That such policy and plan should encourage higher efficiency and organization in traffic and transport,

That the plan should include a program and budget for its consummation.

The only paper directly on the subject of transportation presented at the conference was one in the group descriptive of the New York regional plan. It was presented by Col. W. J. Wilgus and related to recommendations for trunk line connections, passenger rapid transit, internal freight distribution and the port development in the city of New York. On the subject of passenger rapid transit, Colonel Wilgus declared that decentralization was the most important requirement to be borne in mind for a population of 20,000,000, the calculated size of the metropolitan district in 1970. This, he thought, could be accomplished largely by proper rapid transit expansion. Public ownership and non-political operation of these lines were recommended. To encourage the development of the metropolitan district as a whole, several through east and west lines from Long Island across Manhattan to New Jersey were recommended.

In the official discussion on this paper Daniel L. Turner, consulting engineer New York Transit Commission, agreed with Colonel Wilgus that decentralization of the population should be fostered in large cities. This was often unpopular from a transportation standpoint, because exising populations demanded more transit facilities rather than the construction of those facilities in unbuilt areas. One solution of this difficulty was local assessments for new transit facilities. Commenting on recent increases in street traffic, Mr. Turner declared it desirable to provide for main traffic arteries outside and inside the present built-up area. Such superhighways might be combined with parkways, as recommended by him for extensions in Queens County some time ago (See ELECTRIC RAILWAY JOURNAL for Nov. 24, page 892).

In conclusion Mr. Turner referred to the great increase in city debts, which during the last 25 years in New York had increased at a greater rate than the square of the population. A solution of how to obtain improved transportation facilities in circumstances of this kind was by benefit assessments. On this point he said, in part:

"In my opinion a pay-as-you-go policy based on benefit assessments is the most equitable and effective way of enlarging the financial resources of the community in the future. Every public improvement not only benefits the community at large, but also it produces a corresponding local benefit that accrues to the land in the vicinity of the improvement. And where there is a local benefit there should also be a local assessment. We have become so accustomed to the local beneficiaries of public improvements being permitted to retain all of the benefits for themselves that we accept such a principle as a matter of course without realizing how unfair it is to the entire community. Benefit assessment can and should be made to furnish its proper share of the money so urgently needed for future community requirements. This is the only equitable and effective way that the financial resources of our communities can be enlarged sufficiently to meet future demands. It means spreading the cost of all community activities among all those who benefit in proportion to the benefit each receives. The user of the city plant and the general taxpayer should not be the only ones to pay. The land-owner frequently benefits most of all and he should pay his share of the cost also.

"There is nothing new in the principle of benefit assessments. The communities already pay for their street openings by assessment. They pay for their sewers in the same way. In Kansas City the property benefited is assessed to pay for the parks. Under the conservancy law of Ohio the benefit assessment plan is applied to furnish the money to build flood protection works to save the cities, towns and countryside from damage and destruction. In Colorado the Moffat Tunnel through the Continental Divide is being paid for by benefit assessments, and in Detroit the public voted nearly three to one to pay for its rapid transit lines under a benefit assessment financial plan."

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Engineering Council to Unify Reforestation Effort

TO FRAME plans for the elimination of waste in the administration of the vast public works functions of the United States government, and to unify national reforestation effort, the administrative board of the American Engineering Council will meet in Philadelphia on May 8 and 9. Engineers representing more than 30 local and national societies in all parts of the country will attend.

The council, of which ex-Governor James Hartness of Vermont is president, has sent to its member organizations throughout the country a request to aid in the observation of American Forest Week, which President Coolidge has proclaimed for April 27-May 3. Engineers in every state are expected to co-operate. F. K. Copeland of Chicago has been appointed chairman of the Council's Committee on Elimination of Waste in Industry. Other members are: Secretary Herbert Hoover, U. S. Department of Commerce; Dean Perley F. Walker, University of Kansas; R. E. Flanders, Springfield, Vermont; C. C. Thomas, Los Angeles; W. P. Hunt, Moline, Ill.

American Association News

T. & T. Executive Committee

REVIEW of the progress of the various standing committees and a discussion of plans for the program at the coming convention were the principal business coming before a meeting of the executive committee of the Transportation & Traffic Association at association headquarters, New York, on April 15. Abstracts of the reports of sub-committees will be asked for from the chairmen, but these will not necessarily be included in the printed report.

Reports from the sponsors of the standing committees indicated that substantial progress has been made and that the subject assignments will be covered in a comprehensive manner in the committee reports. In connection with the report of the joint accident prevention committee, President H. D. Briggs of the Claims Association was invited to take part in the discussion. It was agreed that one afternoon session at the convention should be devoted to a joint session of the Transportation & Traffic Association and the Claims Association. At this session the report of the joint accident prevention committee will be presented and discussed, in addition to other papers on accident prevention and general safety work.

Plans were prepared for formal discussion of the various committee reports, and it was agreed that the committee sponsors should be responsible for submitting lists of operating men to prepare these discussions. The sponsors are to submit their recommendations to the executive committee at the earliest possible date. No definite time schedule will be followed at the convention meetings.

The question of organizing a freight committee was discussed and it was decided that it would be advisable to defer this until next year. In view of the importance of this subject, especially to interurban railways, it was decided to have a paper presented at the convention and to arrange to have a formal discussion by various operating freight men.

President Cherry appointed as a committee on subjects to recommend definite subjects for study next year J. V. Sullivan, chairman; Samuel Riddle and G. H. Clifford. Those present were President T. C. Cherry, Samuel Riddle, W. H. Boyce, J. V. Sullivan, Paul E. Wilson and James W. Welsh, and A. H. Ferrandou, chairman of the committee on bus operation.

Wood Preservation

DATA on wood preservatives and preservation methods was presented the first day of a two-day meeting of the committee on wood preservation held at association headquarters, New York, on April 7 and 8. Various preservatives and methods of treatment were thoroughly discussed by manufacturer guests, with the view of presenting as much information as possible in the committee report for the information of the electric railway industry.

On the second day only committee members were present at the meeting, which was devoted to the reports of sub-committees on open tank treatment of poles, brush and service treatment of poles, pressure treatment of poles, and methods of increasing life of timber by other than preservatives. All submitted progress reports indicating that the committee will have available for presentation at the convention a valuable report covering the latest developments in the art.

Members present were R. C. Cram, M. J. Curtin, E. F. Hartman, W. H. Harwood, E. L. Morier and A. P. Way, chairman. The guests were J. G. Kreer, American Wood Impregnation Corporation; L. A. Dunham and Mr. Bruce of R. W. Greef & Company; F. C. Zinsser and Allis Miller, Zinsser & Company; George W. Saums of George W. Saums Company.

"Boost the Railways" Night in New York

MANUFACTURER and supply members of the Metropolitan Section of the American Electric Railway Association will be in charge of the regular meeting to be held in New York on May 8. The fact that the manufacturers and supply men have charge of the program is proof that a record attendance may be expected.

The slogan for the meeting is "Boost the Railways," and the opening address will be made by Lucius S. Storrs, recently appointed managing director of the association. This will be the first address by Mr. Storrs before any division of the association since his appointment. He will point out the way by which electric railway interests can be "talked up" supported by every man connected with an electric railway.

Following Mr. Storrs, two addresses are scheduled. The first is by Harry Vanderveer of the National Pneumatic Company, who will deliver a paper on the pneumatic influence in electric railway operation from the prehistoric to the pay-as-you-enter periods of development, with detailed description of the invention, construction, manufacture, installation and operation of the pneumatic engine, interlocking system, safety guard, signal light, automatic treadle door and some hundred or more other devices, and side notes and references to all principles of pneumatic, electric and mechanical operation.

There will also be an extemporaneous speech by a prominent member of the Metropolitan Section who does not yet know that he will be called upon to speak nor what his subject will be.

The entertainment will include a demonstration by Joseph Dunninger, "The Master Mind of Mystery."

The place of the meeting is 29 West 39th Street and the hour is 8 o'clock. A buffet lunch will follow the addresses and entertainment.

Education

CONDUCTING educational courses for an electric railway property on the "departmental group conference plan" was the center of interest at a meeting of the American Association committee on education held in the office of Edward Dana, general manager Boston Elevated Railway, on April 15. The meeting was attended by Chairman Edward Dana, E. M. Walker, C. S. Coler representing M. B. Lambert, W. J. Edmunds, G. A. Barnes and H. H. Norris.

The committee suggested a number of ways in which the association department of publicity can co-operate with educational institutions, and was gratified to learn that the course in public utility economics, prepared by the extension division of the Pennsylvania State College, is complete and will be ready for distribution soon.

A resolution was adopted urging the association to secure articles on educational topics for *Aera*, the subject of education being considered of importance equal to other phases of electric railway activity. The committee was reinforced in this position by a statement made recently in Boston by President Shannahan, that educational work is the most important present phase of the association's activities.

The principal work of the committee was the preparation and approval of a program for conducting "departmental group conferences," such as have been highly successful during the past season on the Boston Elevated Railway. The education committee formulated specific suggestions for carrying out this plan and voted to request all railway members in the committee membership to try out the plan during the coming season and report results.

The committee had in hand a wealth of material regarding educational activities of member companies submitted by members of the committee, which will be digested for presentation in the annual report.

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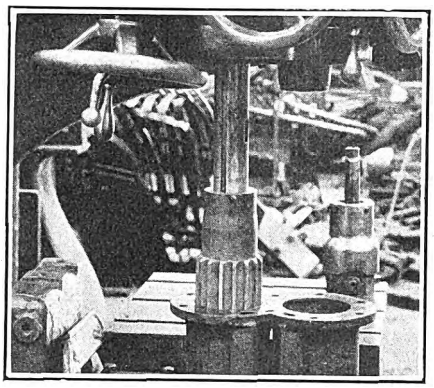
Maintenance of Equipment

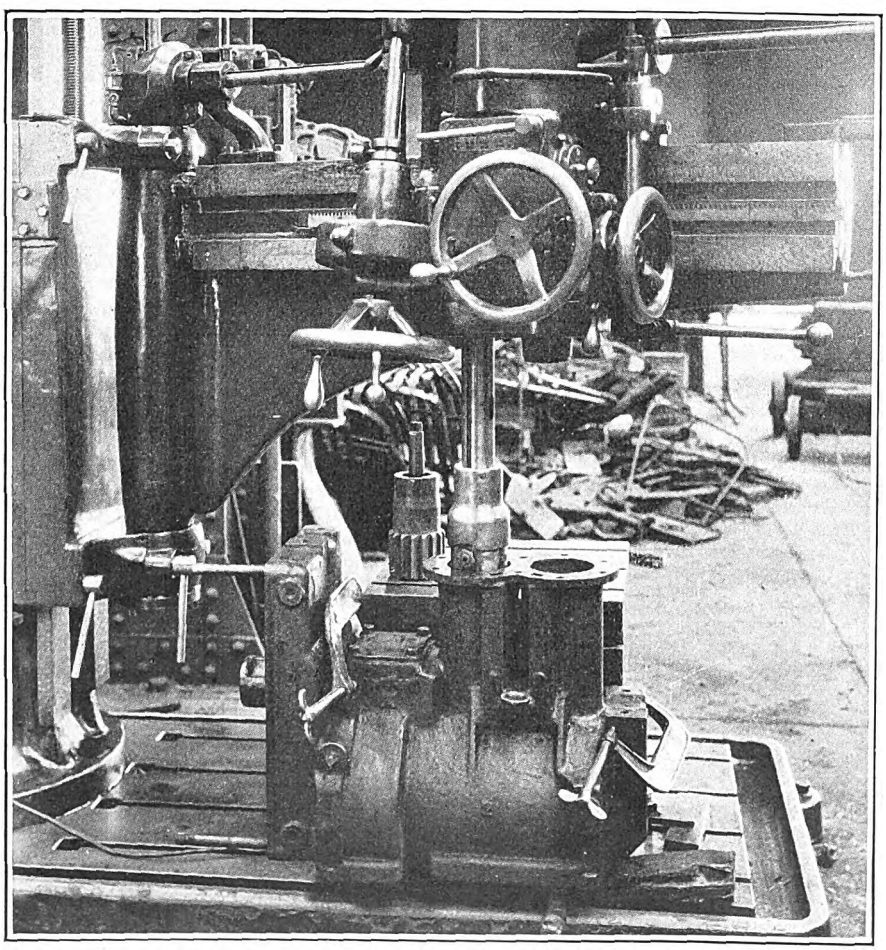
Reboring Compressor Cylinders at Syracuse

WHEN overhauling compressors the practice of the New York State Railways is to rebore a worn cylinder and press in a cast-iron bushing with $\frac{1}{16}$-in. wall. Reboring is done in the Wolf Street shop, Syracuse, on a radial drill manufactured by the Western Machine Tool Works, Holland, Mich. For boring out the cylinders a special boring head has been made which provides for supporting the tool close to the cutting edges so that vibration is eliminated. Boring is done with one operation and the reaming as a second operation. The finish bore of the cylinders is from 0.003 in. to 0.004 in. smaller than the outside diameter of the bushing which is to be pressed in. The bushings for type DH-16 compressors are 10 in. long.



The Reamer in Position for Finishing Cylinder

In setting up a compressor for the reboring, it is lined up by using a straight edge across the finished ends of the cylinder so as to line this up with the finished surface of the drill press bed. After lining up, the compressor is held in place with C clamps. A compressor can be set up for boring in from ten to fifteen minutes and the reboring, pressing in of the cast-iron bushings and finishing of the cylinders require about five hours. The accompanying illustrations show a type DH-16 compressor in position for reboring.



Reboring a Compressor Cylinder on Radial Drill in the Wolf Street Shop, Syracuse

Dipping and Baking Reduces Rewinding

A PROGRAM of dipping and baking railway motor armatures was started in 1922 by the Department of Street Railways, Detroit, Mich. A clear Sterling varnish is used, and the armatures are heated before they are dipped. They remain in the varnish until bubbles stop coming to the surface. At the end of the year 1924 the process had been completed on about 70 per cent of the armatures in service. The average number of armatures rewound per month has been reduced from 77 in 1922 to 50 in 1923 and to 29 in 1924. Officials of the department state that this improvement is due almost exclusively to the dipping and baking process. A still further reduction is expected in the number of rewound armatures when they all have been dipped and baked.

Fixture for Bending Radial Bar Rests

WHERE wrought steel parts are to be bent to a complicated form a jig is essential to insure that the parts are made to the proper shape. It is also easy to place stops on such jigs that will determine exactly the length of material to be used so that measuring is not necessary. The accompanying illustration shows a fixture used in the 155th Street shop of the Eighth Avenue Railroad, New York City, for bending rests used for radial bars. This fixture is arranged to fit in the hardie hole of the anvil. Its use saves much time in the bending operations. The rests are made of 1½-in. x ½-in. bar steel.

The forging operation consists of making a right-angled bend near the right-hand corner, as shown in the illustration. The iron is then bent around the left end of the fixture, so as to make a sharp bend, which is

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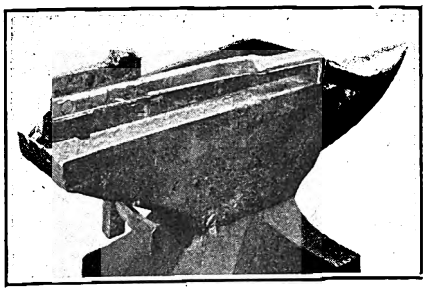


Fixture Used for Bending Rests for Radial Bars in the Eighth Avenue Railroad Shops, New York

approximately a 15-deg. angle. The third bend made, which is a right-angled bend, is that at the back right-hand end. This is then brought down to shape the hook support. This latter short bend is made with a forked fixture. With this jig accuracy is assured and much time is saved in the operation.

Use of Knuckle Joint Connectors

KNUCKLE joint connectors are generally used for completing the electrical circuits to railway motors and for various equipment connections on cars. Where the connection made between pieces of apparatus is to be permanent, this type of connector should not be used, but either a soldered joint or a permanent type connector should be employed.

In opening a circuit, it should never be necessary to use a hammer to break a knuckle joint connector. If the connector becomes stiff, it should be cleaned with a file until a fit which can be broken with the hands is obtained. The use of a hammer to break a connector makes it almost impossible to put the connector together again satisfactorily.

When using the knuckle joint connector to make the connection between the motor cable and the car cable the connector should be placed in a stationary part of the cable and not in the swinging loop, otherwise a hard spot is liable to occur and the cable will break at this point.

Truck Standardization Reduces Maintenance

SOME time ago the Des Moines City Railway decided to standardize, as far as possible, its car trucks, motors and wheels. Old motors were replaced by modern GE-247 equipments, and 26-in. wheels were adopted as standard on the property.

A number of Brill 27-G trucks had been used previously in service with older motors and larger diameter wheels. When the motors were replaced the trucks were still in good condition, but it was desired to use 26-in. wheels so as to have only one standard for wheel size and motor equipment on the property. This was accomplished by rebuilding the trucks.

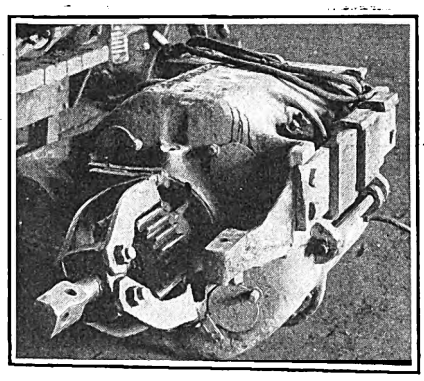
New wheels and axles were used with the old truck side frames. To take the 26-in. wheels, the end frames and brake rigging were shortened. The side links were swung outward so as to clear the smaller wheels. The total cost of this work amounted to about half the cost of new trucks.

As a result of the completion of this standardization program and the installation of new motor equipment the maintenance forces have been materially reduced. The total electrical force in the shop working on motor overhaul, armature repairs and wiring consists of only three men and a foreman.

Screw-Type Pinion Puller

A TYPE of pinion puller with two jaws to go back of the pinion and a screw for producing the pressure is used in the Utica Park shops of the New York State Railways, Utica Lines. This pinion puller is a shop-constructed piece of equipment. A special feature consists of arranging the fulcrum point for the two jaws close to the center of the pinion, so that the grip on the pinion increases as pressure is applied.

In construction, the pinion puller is built up about a large nut which serves to mount the two jaws and which is also tapped out in the center for the screw through which pressure is applied. The outside end of the screw has a square head with



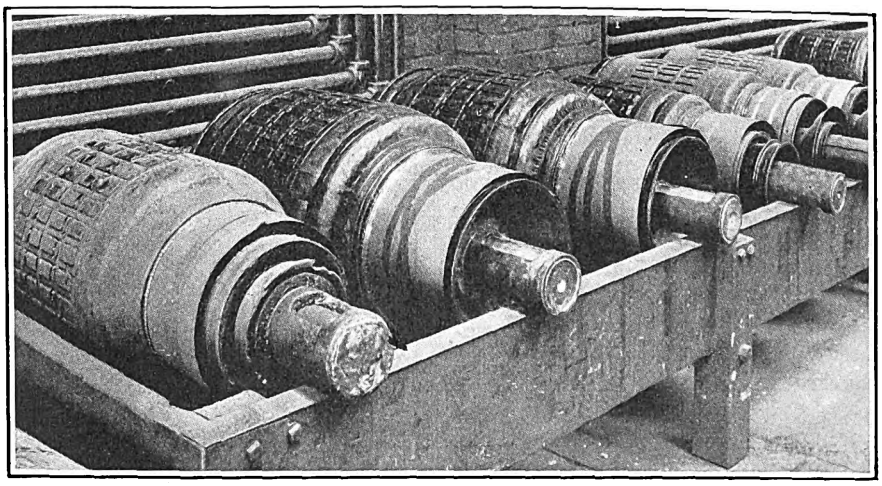
Pinion Puller with Jaws that Tighten as Pressure Is Applied

holes through which bars are placed for turning. The jaws are open, so that the two sides fit into the teeth of the pinion and the back end projects down so as to give a firm grip for removal.

Protecting Commutators from Dirt During Storage

AFTER armatures have been rewound or repaired, a considerable time frequently elapses before they are installed in motors. It is quite essential that no dirt be allowed to collect in the slots where the mica has been undercut between commutator bars. As a protection to the commutators after the armatures have been repaired and are awaiting installation in cars, the practice in the Wolf Street shop of the New York State Railways, Syracuse, is to tape on a cardboard cover. This effectively prevents damage to the commutator and keeps out dirt and moisture.

It also will be noted that each armature is equipped with bearings. It is the practice in Syracuse to fit each bearing to the particular shaft with which it is to operate, after which the bearings are kept with the armature.



Cardboard Covering, Held in Place by Tape, Protects Commutators

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New Equipment Available

Renewable Fuse

A KNIFE-BLADE type of renewable fuse with but six elements has been developed by the Johns-Pratt Company, Hartford. Conn. The six elements include the knife blade with renewable links, a two-part spacing and lock washer, two end caps, and a fiber tube with two threaded metallic ends. The fuse links of the knife-blade elements are made in sizes ranging from 61 amp. to 100-amp. capacity and have slotted ends so that loosening of two bolts is all that is required to permit their release and replacement. In types of larger capacities which include fuses for 110 amp. to 600 amp., complete assembling of the bolt is required as the ends of the links are not slotted.

Improved Circuit Breakers

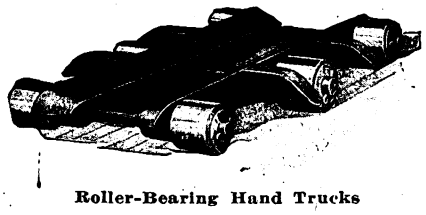
THE new General Electric type MR circuit breakers for electric railway service have improved current rupturing characteristics over previous designs, due to the powerful magnetic blowout and the use of arc suppressor plates. The rupture is complete, in case of short circuit, in approximately 0.03 second, about half the time required by the previous ones.

A heavy compound base, held in the box by three cap screws, supports all of the operating mechanism. Examination of the contact tips may be made easily by the removal of the arc chute, which is held in place by a single latch attached to the box in such a way that it can be moved only when the cover is open.

The new models include the following continuous ratings: MR-20-A, 15 amp.; MR-21-A, 70 amp.; MR-22-A, 140 amp.; MR-23-A, 240 amp.

Light-Weight Shop Trucks

A NEW line of hand-drawn shop trucks is being introduced to the market by the Marion Tool Works, Inc., Marion, Ind. Solid metal construction is used throughout, which makes the dolly light but still sturdy enough to handle heavy loads. The trucks are equipped with steel axles and wheels and with roller bearings. They are built low to the floor and have no sharp edges, which might damage equipment. Holes are provided for attaching special skids,



Roller-Bearing Hand Trucks

removable platforms or special bodies where desired.

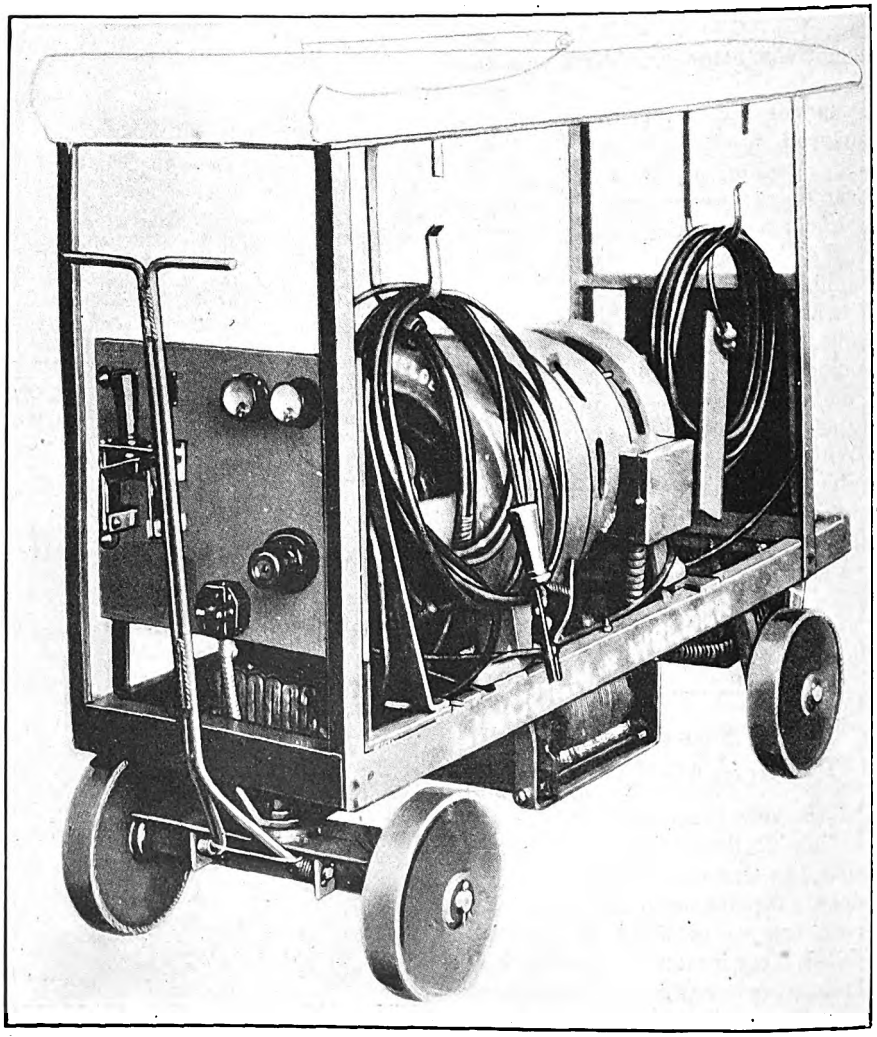
The skid projections make this type of dolly particularly easy to load and unload, and the roller bearings make it possible for one man to handle heavy loads. By means of a lock the wheels are fastened sidewise while the truck is being loaded, so that accidents which might result from the truck drawing or creeping away are prevented.

Portable Arc Welder

UNUSUAL ease in operation is claimed for a new portable electric welder especially designed for use in railway shops which has been put on the market by the Lincoln Electric Company, Cleveland, Ohio. The equipment is said to be especially well adapted to shop work because of its relatively narrow width, which is but 21 in., so that it will pass readily through the narrow aisles found in some railway shops.

The machine is low to the floor so that it will not tip over. The frame is of structural steel, extending beyond the equipment so as to protect it from damage. The stable-arc method of welding is used, which is said to revolutionize old ideas of welding. The new equipment is of 300-amp. size, which has been found to have the greatest economy in railway work.

The stable-arc method provides a steady, uninterrupted flow of heat, enables the operator to handle the equipment with ease, and gives great speed and a high quality of work. A push-button starter, tool box handy but out of the way, spring controlled handle which is out of the way when not in use, handy cable hooks, and light total weight are some of the other features.



Truck Mounted Arc Welder for Shop Use

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The News of the Industry

Service-at-Cost Suggested

Conferences at Buffalo Believed to Have Resulted in Bringing City and Railway Together

City-company co-operation as a means of solving the traction problems of Buffalo, N. Y., was agreed upon at a series of conferences attended by representatives of the International Railway, Mitten Management, Inc., members of the Buffalo City Council, a committee of the Chamber of Commerce, the Public Service Commission and publishers of the daily newspapers in Buffalo. Members of the City Council are now investigating municipal supervision over traction lines in other cities, particularly Cleveland, and newspaper owners have turned an about face from their former hostile attitude.

Partnership Arrangement Favored

Details of the series of conferences were withheld from the public by agreement, but it is known that officials of the International Railway are prepared to consider a service-at-cost plan of operation under the supervision of a commissioner appointed by the city with close co-operation between the management of the railway and the municipal authorities.

Later conferences held between representatives of the railway and the municipal authorities considered immediate improvement in service, the matter of paving between the tracks on certain streets and the betterment of rails and equipment and more adequate supervision over the spacing of cars to prevent bunching and traffic delays.

Mayor Frank X. Schwab, who has been continuously harassing the management of the International, announces that he is well pleased with the results of the first series of conferences. Representatives of all city interests discussed the traction problems freely and the newspaper publishers are reported to have consented to withhold criticism of the railway pending the outcome of the present negotiations. This was the first time that various interests in Buffalo have had a heart-to-heart talk with executives of the railway and Mitten Management, Inc., regarding the traction problems of the city.

Many Prominent Men Attend

Among those who attended the first conference were: Thomas E. Mitten, chairman of the executive committee of the International Railway and president of Mitten Management, Inc.; Herbert G. Tulley, president of the International; J. A. Queeney, vice-president of Mitten Management, Inc.; B. J. Yungbluth, vice-president of the International Railway; Mayor Frank X. Schwab and members of the City Council, except Commissioner Frank C. Perkins, the Socialist member of the board, represented the municipal government. Commissioner Perkins believes in public discussions. N. L. Danford, president of the Buffalo Chamber of Commerce; J. P. Williams and G. C. Lehman represented the Chamber of Commerce, and five local newspaper publishers also were present with members of the Public Service Commission.

In a joint statement signed by Mayor Schwab, Mr. Mitten and Mr. Williams, the conference informed the public that there will be detailed consideration at future meetings of the Cleveland, Detroit and Rochester plans of municipal supervision. The offer of the International Railway to submit a digest embracing portions of the three plans best adapted to the city of Buffalo was accepted. Pending consideration of the city-company plan, the railway has agreed to co-operate with the city so that every possible improvement in service can be made at once.

After the third conference, Mayor Schwab issued a formal statement saying he is not in favor of the city buying the local properties of the International Railway at any price or the city assuming any financial obligation in regard to the company. He said that neither of these must be done under the Tayler system now in operation in Cleveland. After an inspection of conditions in Cleveland Mayor Schwab said he found that the service-at-cost plan had worked successfully in that city for fifteen years.

Worcester-Leicester-Spencer Service to Be Restored

The Worcester Consolidated Street Railway, Worcester, Mass., which abandoned its Worcester, Leicester and Spencer line early last winter, has announced that service on the line will be restored about May 1. The resumption will be accompanied by a reduction in fares for those who do not use the weekly ticket. The fare from Worcester to Spencer will be 40 cents instead of 45, to Leicester 20 cents instead of 24 and to Cherry Valley 10 cents instead of 17. Express service between City Hall, Worcester, and the Leicester line is planned.

The proposed new rates will be accompanied by a change in zone charges and fare limits. There will be four zones instead of six and the zone charge will be 10 cents instead of 7 cents. The company will put into effect a $1.25 weekly ticket for riders who commute from St. Joseph's Church in Leicester to Worcester. Passengers will be permitted to ride between Spencer and the Worcester city line for $2.50 weekly and between any point in Leicester and the city line for $1.75. From the city line of Worcester to the local city hall the cash fare will be 10 cents.

Bus Grant Accepted

Stage All Set to Begin Operations in Kansas City with 60-Car Fleet —Negotiations Ended

The three-year bus franchise, the ordinance for which was passed by the City Council on April 6 and approved by Mayor Albert I. Beach on April 7, was formally approved by Judge Kimbrough Stone, referee in the receivership of the Kansas City Railways, on April 20. Judge Stone, on the latter date, held a formal hearing on the franchise ordinance to give the company's creditors an opportunity to enter objections to the expenditure involved in the event that the company starts a bus system.

When no objections were offered at the hearing, Judge Stone authorized the receivers of the railway to accept the terms of the ordinance and to expend any required amount up to $750,000 for buses and equipment. Thus ended the fight for bus transportation in Kansas City, which has been in progress almost constantly since December, last year.

Fred G. Buffe, general manager for the receivers, said that plans for a thoroughly modern garage for about 65 to 70 buses would be finished at once, construction to begin immediately. He said that the final decision as to the make of buses to be used had been made and the deal for the purchase of such equipment will have been consummated within the next two weeks. The first bus line will probably be in operation July 1. Under the terms of the franchise, the first line must be established by the latter part of July and two additional lines must be started each month until the nine routes are in operation.

Col. Bennett Clark, St. Louis, Mo., was present as spokesman for the reorganization committee. He approved the proposed bus project and specifically waived all objection to certain provisions of the franchise in view of the short term of three years during which it is to be effective.

In approving the bus ordinance and sanctioning the acceptance of the franchise by the receivers, Judge Stone is said to have indicated that certain provisions of the ordinance would have necessitated very careful study had the duration of the franchise been for a longer period of years.

Francis M. Wilson, one of the receivers, said:

> We have the required authority now, but we are not going to rush into the purchase of buses. We will be guided by caution, not by a desire for speed, and we intend to avoid mistakes, if we can, in purchasing equipment. This is an experiment in bus operation and we desire the new service to have a fair chance to prove its merit and practical worth. It is true that we have already agreed upon the make of vehicle to be purchased.

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Mr. Wilson said that he is confident that the new garage will be as modern and efficient as could be desired. Three of the officials of the company are said to have just returned last week from a tour of inspection of garages in Chicago, Detroit and St. Louis, Mo.

Mr. Buffe said that there are to be nineteen double-deck buses, 41 single-deck ones and four special buses in the initial outlay, which is to furnish accommodations for the nine routes, one of which will have express service.

Mayor Beach is said to have expressed his gratification upon hearing of Judge Stone's approval of the bus franchise. He said that Kansas City needs buses badly and pledged the city to co-operate in every possible manner with the railway receivers in the operation of the buses.

Service-at-Cost Contracts Approved for Missouri Cities

Service-at-cost contracts between Missouri municipalities of 100,000 population or more and electric railways, bus companies and other common carriers are now possible under the terms of an enabling act passed by the Missouri House of Representatives on April 1. The bill had previously been approved by the Senate, but goes back to the Senate for concurrence to minor amendments tacked on in the House. The bill was sponsored by Bennett Clark, attorney for the organization committee of the Kansas City Street Railways. The measure applies to St. Louis, Kansas City and St. Joseph. Under the measure cities cannot enter into a contract for a period longer than 30 years without the approval of the voters.

Staten Island Tunnel for Passengers

Governor Smith of New York has approved the Hofstadter bill providing that the Brooklyn-Staten Island tunnel may be constructed by the Board of Transportation with the approval of the Board of Estimate and appointment of the city of New York instead of "shall be constructed by the Board of Estimate and Apportionment," and that such tunnel if constructed shall be for rapid transit purposes exclusively.

The Governor based his reasons for signing the bill upon the fact that it seems to be the weight of engineering opinion that it is not practical to operate rapid transit trains on the same tracks provided for freight and the wishes of the people of Staten Island for transit facilities.

The Governor explains that the tunnel as designed calls for an expenditure of approximately $60,000,000, while a tunnel designed for rapid transit would call for an expenditure of about $22,000,000. He says this money could well be applied to the construction of additional subways and that the business thing to do is to change the law, give Staten Island her rapid transit tunnel at the earliest possible moment, let the freight feature be cared for under the comprehensive plan of the Port Authority, drawn to feed all five boroughs of the city, having behind it the sanction of New York and New Jersey.

Transportation Problem in Pomona Remains Unsettled

The future operations of a bus system to supply Pomona, Cal., citizens with transportation appears to be somewhat a matter of doubt, as recent investigations by the citizens' committee show it legally impossible for the city to subsidize the City Transit Company to make possible the guarantee of local bus service. Furthermore, it was found impracticable for the city to acquire by purchase or lease the equipment of the City Transit Company and operate it as a municipally-owned bus system.

Based upon the unsatisfactory findings of the committee the Mack Motor Bus Company of Los Angeles, it is reported, stated service would be discontinued as soon as the city had filed notice of its inability to support the bus system. The Mack concern holds title to the bus equipment, on account of the failure of the City Transit, Inc., to meet payments on the layout of equipment. The City Transit Company is some $13,000 in the "red" as a result of six months' operation.

The bus system was put into operation on Sept. 15, 1924, and was undertaken after the Pacific Electric Railway had been authorized by the California State Railroad Commission to discontinue its local one-man car service. The abandonment was allowed on the plea of the company that its local lines in Pomona were being operated each year at a distinct loss. Finally the commission authorized the company, after discontinuance of service, to remove physically its tracks from the streets of Pomona, as it formerly operated quite an extensive mileage in the city.

The bus system was a dream of the former Mayor of the city, who was a most ardent sponsor for its establishment under the present manner of ownership and operation, and his death a few days before the service was started in September last was keenly felt.

With the passing of the present system, possibly out of existence, Pomona will be without mass transportation unless the "jitney" type of bus enters the field to be the final solution of the problem.

Arbitration in Atlanta

Possibility of a strike tying up service on the railway lines of the Georgia Railway & Power Company, Atlanta, Ga., was averted on April 16, when officials of Local No. 732 of the Amalgamated agreed to arbitrate demands for an increase of maximum wages paid motormen and conductors. The local union has selected Luther Still, well-known Atlanta labor leader, while the Georgia Railway & Power Company has named C. Murphey Candler as its representative on the arbitration board. The two will select a third member to complete the board. Both Mr. Still and Mr. Candler served last year on a similar arbitration board.

At present trainmen are being paid 43 cents for the first nine months of service, 48 cents for the second nine months and the maximum of 51 cents after they have served a year and a half with the company. An effort will be made by the union, it is understood, to advance each of these rates to trainmen. It was at last year's arbitration that the maximum was advanced from 48 cents to 51 cents an hour.

Present demands include proportionate increases for all other members of the union in the employ of the power company. Although wages have been advanced from 25 cents an hour as a maximum to 51 cents since 1913, the union insists that the wages paid are still too low to meet present-day standards of living. It is asking for a maximum of 60 cents an hour for motormen and conductors.

Because of jitney competition, the power company has refused to consider any demands for increased wages during the past year. With this competition removed and the way paved for an increase in the income of the department, it is possible that some of the demands of the employees can be granted by the company.

Two Arbitrations in Scranton

The Scranton Railway, Scranton, Pa., and its employees are in the midst of two separate and distinct arbitrations. One of these concerns the suspension of Motorman Harry Laymon and the other concerns the question of wages and contract for the coming year.

For violation of rules at the New York, Ontario & Western Railroad crossing in the Borough of Mayfield, endangering the lives of some 55 people, Motorman Harry Laymon was suspended on Feb. 15, 1925. The union took exception to the company's ruling. It threatened a strike if he was not reinstated and paid for all time lost. W. B. Fitzgerald, international vice-president of the Amalgamated, went to Scranton and insisted the men withdraw their strike threat and live up to the contract. This agreement, effective from April 1, 1924, to April 1, 1925, stipulated that in the event the differences could not be settled arbitration was to decide the issue. The company has selected as its arbitrator D. R. Reese, general counsel of the Delaware, Lackawanna & Western Railroad and president of the Lackawanna Motor Club. The union has selected Frank Walsh, business agent of the garment workers' union. No agreement has been reached on the third arbitrator.

In the draft of contract submitted by the union there were a great many changes in working conditions and a demand for an increase in wages of 16 cents an hour for all crafts. After two days discussion the company refused to grant any of the requests except to make two concessions regarded as mutually advantageous. The company offered to renew the old wage scale and operate under the existing conditions. This the union failed to accept, and after a meeting and a strike vote, which was lost, it notified the company that it would arbitrate the wage case. The company thereupon selected John M. McCourt, member of the law firm of Knapp, O'Malley, Hill & Harris and the same arbitrator as last year, while the union selected L. F. Hart, its business agent, also the same man selected last year. The third man has not been selected.

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P.R.T. Fare Hearings to Be Resumed

Hearings on the Philadelphia Rapid Transit Company's fare rate case will be resumed before the Public Service Commission in Harrisburg on April 29. The commission stated that the date was set after consideration of a petition and complaint filed recently by the United Business Men's Association, which sought to procure revocation of the present 8-cent fare order. Since the filing of that petition the city has decided to join the fight to reduce fares. The commission stated that it had also notified Milo R. Malthie, New York, who has been investigating the Philadelphia case for several months, to be prepared to submit his final report.

The answer of the company was filed with the commission on April 15. It admits certain facts that the petitioners allege, but denies generally the assertions relative to the company's earning capacity. The company admits that the wage requirements for 1924 were met and that the fare, 8 cents cash or two tokens for 15 cents, has been in effect since Sept. 25, 1924, and that the company's balance sheet shows a surplus of $5,600,000. Of that balance, however, it is said, a large part was earned in 1924. The rest represents accumulations since the formation of the company. During many of these years no dividends were paid upon the company's stock.

Bus Plan for Norfolk Goes Before Public

A public hearing was held in Norfolk, Va., on April 16 on the ordinance providing for control of bus transportation by the Virginia Railway & Power Company. The City Council advisory transportation committee of Norfolk has approved the proposal of the railway company for bus operation in the city. The plan that was suggested calls for universal transfers between street cars and buses, with a general bus fare of 7 cents and a provision for school tickets. Mayor Tyler has announced that the Council will seek public reaction from all sections. Copies of the proposed ordinance were prepared for distribution, as the Council desires that the public understand the plan from every angle.

Independent bus operators who have invested money in motor vehicles have opposed the grant of the permit to the company, as the traction company proposes to take over the bus equipment now in service wherever possible. The Bus Association, Inc., representing the majority of independent operators, is unwilling to surrender the business of its members without a fight and has filed a 3,000-word attack on the plan. The document refers to the rights of the independent bus operators, favors competition and prophesies higher fares.

It was announced in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 31, 1925, page 199, that the company was ready to submit a plan for the operation of buses in Norfolk in co-ordination with or as an auxiliary to its railway system there. At that time it was stated that the company was willing to reimburse operators of bus routes which it took over on the appraised value of the equipment by a board of arbitration, if the company and owners were unable to agree. Further, that the company was willing to begin the operation of buses without additional legislation from the Virginia Assembly.

Straight Seven-Cent Fare Refused in Shreveport

Chairman Huey P. Long of the Louisiana Public Service Commission has refused the application of the Shreveport Railway for a blanket 7-cent fare and has granted the company a 7-cent cash fare with lower rates for those who purchase tickets. The order granting the company a 7-cent cash fare requires the sale of four tickets for 25 cents, 6¼ cents each, and the sale of a block of seventeen tickets for $1. In his finding Chairman Long said:

> With the exception of a few lines one-man cars should be operated. It is quite evident that on some of the lines a great saving could be made in this manner. Just what lines should be excluded from this operation of one-man cars, and during what hours, we would not attempt to dictate because the proposition is one for local regulation.
>
> It is testified that jitney buses are being regulated by the city, and that such regulation continues to become of growing benefit to the company's service and the community safety. This also is another matter of local control, but many cities appear to have adopted a similar course.
>
> We are reminded that the company is forced to pave streets. It is not our function to pass upon the question of the reason why such an obligation can be justified.
>
> If we order a fare in this case that tends toward constantly diminishing the number of car riders, the problem may never be solved. But if, on the other hand, we can see our way clear to order a somewhat better fare, such as will encourage car riding, the company's relief may be brought to hand. Again, a system of charges that tends to popularize the company's service may inspire a good will that will make much more easy of accomplishment the economies that may appear necessary from time to time.

The railways contended for an increase in fare from 6 cents to 7 cents per passenger, including transfers, and not to affect fares of school children. It argues against a reduced rate for tickets.

Operating revenue for the year ended Dec. 31, 1924, was:

Gross earnings	$648,274
Operating Expenses—	
Maintenance of way	$48,603
Maintenance of equipment	77,081
Traffic expense	7,485
Operation of cars	244,589
Power	68,818
General expense	70,250
Taxes and license	45,000
Depreciation	52,543
Total	$614,371
Net income	$33,902
Other income	1,907
Total	$35,310
Less Fixed Charges—	
Interest on bonds	$35,000
Other interest	7,859
Total	$42,859
Net loss	$7,048

Resolution Would Prohibit Tax-Exempt Securities. — The Wisconsin Legislature recently passed a joint resolution asking Congress to submit to the states for ratification an amendment to the Constitution of the United States prohibiting the further issuance of tax-exempt securities by federal, state or local governments.

Unofficial View of Decision in Kansas Case

Substantial legal opinion at Washington takes the view that the decision of the Supreme Court in the Kansas case has been badly interpreted by the press. The decision is thought to be epochal for the reason that it did not outlaw compulsory arbitration. On the contrary, it was made clear that, where a strike would interfere with contractual obligations for the performance of essential public duties, it is within the power of government to compel arbitration.

The inference is that the Supreme Court would sustain a law compelling arbitration in the case of labor disputes affecting operation of the railways or of the telegraph lines. "The power to compel the continuance of a business because affected with a public interest is altogether exceptional, as the court says," a prominent attorney comments, "but it does exist and the court has by no means indicated otherwise."

It is significant that the decision was unanimous.

San Francisco Decides on Duboce Rapid-Transit Tunnel

After several heated sessions before the San Francisco Board of Supervisors concerning the relative merits and disadvantages of the Eureka-Sunset and Duboce tunnel projects, respectively, a decision was reached on April 6 favoring the Duboce tunnel. The cost will approximate $1,600,000, all of which will be met by the proceeds of an assessment of property owners in the district. The assessment plans must be approved by the board.

The route selected is the longer of the two proposed and, unlike the proposed Eureka-Sunset tunnel, the Duboce tunnel will be constructed for street car traffic only. It will connect by the most direct route the Sunset and Eureka Valley districts to the southeast of Golden Gate Park and the business centers of San Francisco.

Case of St. Louis-Kansas City Line Before Commission

Argument on the question of whether the Missouri Public Service Commission should issue a certificate of convenience and necessity to the proposed St. Louis-Kansas City Short Line Railway were heard at Jefferson City, Mo., March 23 and both sides to the controversy submitted final briefs.

Representatives of the steam railroads told the commission the proposed line would cost $60,000,000. They also asserted that the proposed railroad had not secured franchise rights either in St. Louis or Kansas City, its proposed terminals. Further, they alleged the new line would furnish competition destructive to the existing steam lines.

Proponents of the proposed line stated that the steam roads had never furnished service that would develop the territory they plan to serve and are now endeavoring to defeat an effort to give a great section of the state modern transportation facilities.

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Adjournment in Albany Fare Case

The United Traction Company, Albany, N. Y., presented to the Public Service Commission on April 17, at a hearing on its petition for an increase in fare from 7 to 10 cents, a valuation figure of $18,113,079, upon which its officials and experts rested their claim that the increased fare be granted to the company on its Capitol district lines. The company claims to have lost $4,000,000 in ten years.

Albany city officials sought a five months' adjournment to permit its expert, Edward W. Bemis, to establish a value for the lines. Chairman Prendergast of the commission said he would allow five weeks. Adjournment was taken to June 1.

The United Traction Company's figures were presented by George H. Burgess, after John E. McLean, counsel for the railway, had declared that the company was unable on the 7-cent fare to pay interest on bonded indebtedness. The city's chief attack, it is reported, will be directed to show that the company is placing too high valuations on the investment for which it may claim a return.

Railway-Bus Plan Delayed in Toledo

The Community Traction Company, Toledo, Ohio, which was scheduled to have submitted a new transit plan for unified street railway and bus operation in Toledo, at a City Council meeting on April 20, asked for more time to permit counsel to go into many difficult questions.

Henry L. Doherty in a letter to the Mayor and Council, read at the session, asked for co-operation in solving the present problems and blamed "selfish politicians" largely for the present status of affairs. He stated that he was sincerely interested in helping Toledo and proposed that the city employ an outside expert to make a transit survey and study of the city. Mr. Doherty offered personally to finance such a study up to $25.000. Otherwise the company will probably have its relief plan ready for Council by May 1.

Mayor Brough, to whom the letter was addressed, advised against the survey, as making for added delay, and recommended that the company bring in its report as soon as possible.

In his letter Mr. Doherty declared that the Milner ordinance "is the best street railway ordinance that was ever drawn and much better than the Tayler ordinance." He declared that the real difference between the two had been that the Milner ordinance had never had the co-operation of the people of Toledo while the Tayler ordinance did receive the co-operation of Cleveland. It was his opinion that if it had not been for the long period of misunderstanding and embarrassment in which the railway system of Toledo had been compelled to suffer, due to the difficulties of reaching an agreement with the city and the lack of co-operation which had prevailed since the passage of the Milner ordinance, a vastly improved condition with respect to railway operation would be the status today.

Mr. Doherty said that it seemed idle to believe that buses could ever compete successfully with a street railway system, but conceded that there was a place in most transportation systems for buses as a supplementary factor and not as a competitor. He also intimated that drastic restriction of private automobile parking in the congested districts would tend to benefit street railway systems.

Amendments Suggested to Michigan Bus Bill

Clarence E. Wilcox, counsel for the Detroit Department of Street Railways, Detroit, Mich., has offered amendments to exempt municipally owned bus lines and certain privately owned buses and trucks from the provisions of the Karcher bill, now before the Legislature. He wants the Michigan Public Utilities Commission authorized to weigh public demand in consideration of permits for bus lines. The Detroit Street Railway Commission's buses operate into Highland Park and other suburban cities. It was pointed out by Mr. Wilcox that the proposed bill would impose a heavy additional tax on these buses and, in addition, it would give the Michigan Public Utilities Commission power over the city's system not intended by the home rule act. In short, Mr. Wilcox wants municipally owned buses exempted, not only for operations within the city but also in a zone reaching 10 miles beyond the city limits, as provided by the home rule act. His proposal was opposed by W. G. Fitzpatrick, attorney for the Detroit United Railway. The amendment providing for the consideration of public demand was also opposed by the D.U.R. attorney on the ground that public demand was a fickle thing, easily influenced. W. F. Evans, president of the Detroit Motor Bus Company, backed Mr. Wilcox. He said preparation must be made for the time when the private automobile will be used less promiscuously than it is now. Detroit jitney operators would be made common carriers by the bill as it stands.

Change in New York Law Approved

Governor Smith on April 13 approved the Nicoll-Hofstadter bill, which will take away from the State Transit Commission the power to modify agreements between the New York City authorities and traction companies operating within the city. The bill was introduced to carry out a recommendation contained in the report rendered by Justice John V. McAvoy following his investigation of the New York City transit situation. The provision in the law repealed by the bill was enacted during the régime of Governor Miller. It proved most objectionable to Mayor Hylan. The Transit Commission was not opposed to the measure. Indeed, Chairman McAneny of the commission insisted that the power was an improper one that should not be continued. The Transit Commission has never exercised the power since the clause was enacted.

Intermediate Permit Law Passed in Oklahoma

The Legislature of Oklahoma has passed a bill known as the revocable permit law, which permits public utility companies engaged in furnishing gas, electricity or water under a municipal franchise to surrender such franchise at any time before its expiration and receive in lieu thereof a permit from the Corporation Commission of the State. The bill provides, among other things, that no company may commence the business of furnishing public utility service in any municipality so long as there is in existence a valid franchise or permit authorizing any other company to conduct in such city or town a business similar to that proposed until the Corporation Commission shall issue a certificate of public convenience and necessity therefor.

Capital Traction Company an Industrial Exhibitor

Washington's first industrial exposition, fostered by the Chamber of Commerce, was held March 21-28 in the new auditorium. About 90 exhibitors displayed products made in the capital.

As a producer of transportation the Capital Traction Company occupied the most conspicuous position on the main floor of the auditorium—a space octagonal in shape with a diameter of 31 ft.

The company's display was so conceived as to be artistic as well as instructional. Columns erected at each angle of the octagon were each surmounted by a small street railway car, painted the same shade of green as cars on the streets. These cars were illuminated at night.

A cabinet about 20 ft. long and 9 ft. wide, erected at one end of the space, was surmounted in the center of the roof by a larger model of a street railway car, and at each corner was a column bearing a large light globe.

Through the front wall of the cabinet, facing the entrances to the hall, was cut a space for the "screen" of an automatic lantern slide machine. On the back wall was a large painting of the Capitol, the Monument, the Lincoln Memorial, a bathing scene and one of a Zoo. At the bottom of this painting two miniature Capital Traction cars were reproduced.

In the automatic slide machine 39 slides were used to illustrate important events in Washington's municipal transportation history and to give essential facts to the public about operating costs, etc.

Two employees of the company were in constant attendance at its booth and 5,000 safety buttons with safety slogans and the company monogram, "C. T. Co.," were distributed, many of them to school children. Several thousand booklets containing facts about the company and copies of a street railway guide to Washington were distributed.

The white, blue and gold color scheme of the display attracted much attention from the 40,000 visitors during the seven days the show was open.

Seats placed at various convenient points offered visitors to the booth a chance to rest for a moment.

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Recent Bus Developments

Many Items of Interest Reflecting the Increased Use of the Bus by the Electric Railways—Important Authorizations—Public Service Victor in South Jersey

THE Public Service Railway, Newark, N. J., recently purchased the two independent bus lines owned by Charles A. Aceto in Camden and operated as the Continental Coach Company and the Aceto Bus Company. The purchase price was $100,000. The sale included eight buses. Its consummation removes from the field the last of the independent companies in Camden. In a full-page advertisement in the Camden *Courier* for April 15 Mr. Aceto said that the point was reached where competition between his own company and the Public Service created a deadlock and that the people who needed a better, more efficient transportation system were the real sufferers. He believed that the Public Service Railway could offer that district better service and a 5-cent fare if his companies were not competing, so he felt he should no longer stand in the way. A portion of his statement follows:

> I extend my sincerest thanks to my patrons and friends who have said kind words about my efforts to provide good accommodations and who, when occasion required, marched to City Hall to help me fight my battles.
>
> To fight the public's battle is a marvelous thing, a great privilege, but no man has a right to expect the public to remain loyal, permanently, to any concern which is beset by such circumstances that it cannot render the best possible service. In the face of desertion by some of my patrons, I know that sooner or later my lines would face utter ruin.

Sixty representatives of bus lines in Minnesota met on April 16 with the Minnesota Railroad and Warehouse Commission to consider the terms of the new bus line control bill, which places regulation with the commission. Commissioner Ivan Bowen explained some of the terms of the law and said a set of rules and regulations would be issued later. The companies were warned they must get permits. The companies in operation when the law was passed may continue until applications are approved or refused, and with a permit lines cannot quit without permission and the commission must act on schedule and fare changes. The companies will be asked to file bonds fixed by the commission. They must have satisfactory liability and indemnity insurance. Cities still retain authority to govern bus routes within their limits.

Entrance of another railway into the bus field is heralded by the application of the Olean, Bradford & Salamanca Railway to the city of Salamanca, N. Y., for permission to run buses over certain streets, among them some that lead to the new Allegany State Park, a mecca for tourists and campers. The company also plans to operate buses between Little Valley and Salamanca, following permission granted by the state to discontinue that link of its interurban trolley system. It was shown that this line had been operated at a loss for some time.

Fares on bus lines in Medford, Mass., have been increased by the Boston Elevated Railway, following the granting of a permit by the city government giving permission for the increase. The buses have been operated on a 5-cent fare since they were established. In connection with the increase the Elevated will extend the transfer privileges for local rides and will issue transfers between Medford and Malden cars. The new rate is 10 cents for cash fares or where transfers are issued carrying the rider to the elevated system and 6-cent local fares where five-strip tickets are purchased.

The Washington-Interurban Railroad, Washington, D. C., was granted permission on April 7 by the Public Service Commission of Baltimore to operate a motor bus service between Bladensburg school and East Riverdale. This new line will replace the railway service.

Governor Smith of New York has vetoed the Thayer and Clayton bus bills. Mayor Hylan opposed both these measures and Corporation Counsel Nicholson presented the city administration's objections at the hearing. The Clayton bus bill would extend to all cities the provision that bus lines shall be considered common carriers. That law now applies only to New York City, but the city Assembly amended it by taking supervision over the bus lines away from the Transit Commission and turning it over to the city authorities. Mr. Nicholson said that the Clayton bill was designed to nullify the city amendments, and that the question as to the legality of these amendments was now being contested in the courts. The case is before Supreme Court Justice Wagner. Governor Smith in his veto said that no changes should be made in this provision of the State transportation law pending the determination of that litigation. The Thayer bill would give local authorities the same control over freight carrying bus lines as over passenger buses. Mr. Nicholson declared that it would turn over all of the freight carrying business in New York City to the New York Central Railroad. The Governor vetoed it because it was loosely drawn. He said that those who appeared for it were not quite clear themselves as to the purpose of some of its provisions.

The Des Moines & Central Iowa Company, Des Moines, Iowa, plans to supplement its present rail service with bus lines.

A franchise ordinance was recently introduced before the City Commission of Chattanooga, Tenn., and referred later to the legal department, which would give the Tennessee Electric Power Company permission to operate buses through certain streets to serve sections east of Missionary Ridge. E. D. Reed, manager of the Chattanooga district, and F. G. Spurlock, of counsel, appeared in behalf of the ordinance. The latter explained that the company desires to have a franchise conforming to the laws of the state but seeks no monopoly of the privileges asked. A general clause of the franchise is to the effect that the buses will cover "such other roads and highways in the vicinity as the demand for service may require." The company will furnish a $5,000 bond for each bus to cover loss of life, injury to person, and damage to property. It is set forth that the buses will bear signs as to destinations and fares, will run on regularly advertised schedules, will arrange for the separation of the races as in the street cars and will charge a maximum fare of 15 cents. The buses, Mr. Reed said, would cost in excess of $9,000 each.

The Lincoln Municipal Street Railway, Lincoln, Ill., is preparing to ask the Illinois Commerce Commission for a permit to operate bus lines in conjunction with its railway.

The Tampa Electric Company, Tampa, Fla., will supplement its railway system with a bus service within the next few months. This announcement was recently made by T. J. Hanlon, Jr., manager of the company. Five Mack buses will be put into 30-minute operation on Florida Avenue between Lafayette Street and Sligh Avenue, a distance of more than 5 miles. Mr. Hanlon said that the first buses would be operated as an experiment and if the service proved satisfactory a number of additional supplementary bus lines would be established.

Authorization for two new bus routes connecting the Manayunk and Wissahickon sections with upper West Philadelphia would be given under an ordinance introduced in the City Council recently. If the ordinance is passed, the Philadelphia Rural Transit Company, the bus subsidiary of the Philadelphia Rapid Transit Company, will operate the lines between the places named through Fairmount Park, skirting George's Hill, the Concourse, and the T. A. B. Fountain in the Park, to the Park entrance at Fifty-second Street. The fare will be 10 cents for a continuous ride, with a 3-cent exchange between the buses and P. R. T. surface lines, subway and "L" lines outside the central delivery district. Councilman Walter, chairman of the committee on transportation and public utilities, introduced the ordinance.

With the approval of the Public Utilities Commission the route of the Sixteenth Street bus line of the Capital Traction Company, Washington, D. C., has been extended from the old terminus at Alaska Avenue and Fern Street, out Alaska Avenue to Floral Street, east on that street to Thirteenth Street, north to Holly Street, thence west to Alaska Avenue and return over that avenue to Sixteenth Street.

Franchises for bus lines which will augment the services of the Portland Electric Power Company, Portland, Ore., have been submitted to Commissioner Mann by F. I. Fuller, vice-president of the company, and these will be worked over by Mr. Mann and City Attorney Grant, to present at an early session of the Council. The franchises will affect many streets in the city where street car service now is declared to be inadequate, and particularly in the newly developed and more remote residential sections not reached by car.

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Pay Advance Rejected in Cleveland

Members of the union in Cleveland, Ohio, have voted to reject the increase in pay of 5 cents an hour offered, effective May 1, by J. J. Stanley, president of the Cleveland Railway. Mr. Stanley's offer was conditioned upon the men accepting the open shop. The local Court of Appeals has already decided that the present contract between the men and the company is void because of the open shop provision in it.

In rejecting the increase, the men decided to appeal the decision of the Court of Appeals to the State Supreme Court. A hearing to determine whether the State Supreme Court will admit the men's appeal is scheduled for April 28. If the Supreme Court refuses to hear the appeal of the men, officials of the Cleveland Railway are prepared to start operations under the open shop at once.

In offering the men an increase of 5 cents an hour, Mr. Stanley demanded that in case of grievances the men choose either him or a special board of arbitration, rather than continue the present procedure of appeal from operating officials to Mr. Stanley and from Mr. Stanley to a special board of arbitration.

News Notes

One-Man Car Bill in Tennessee.—The House of Representatives passed recently the Whitfield-King-Brown bill to make it unlawful to operate one-man street cars in the large cities of Tennessee. The bill had already passed the Senate. It will eliminate one-man cars in Nashville, Memphis and Knoxville, but was amended so as not to apply to the smaller cities of the state.

Passes Increased to $1.25.—The New Brunswick Power Company, St. John, N. B., recently increased the price of passes to $1.25. This was an increase of 25 cents over the original fee.

Cash Fares Advanced.—The Railroad Commission has authorized the Beloit Traction Company, Beloit, Wis., to raise its cash fares from 5 to 7 cents and the ticket fare from 25 tickets for $1 to sixteen tickets for $1. The rate to school children will remain the same. The decision of the commission was based on the fact that the company operated during the past three years under a rate schedule which was insufficient to provide for depreciation and returns on investment.

Car Crew Successful Sellers of Stock.—The successful use of employees as salesmen in the distribution of utility securities was forcefully demonstrated during the recently completed stock-selling campaign conducted by the Duluth-Superior Traction Company, operating in Duluth, Minn., and Superior, Wis., through which 1,986 customer owners were added. In commenting on the sale of this $1,500,000 stock issue, Herbert Warren, vice-president and general manager of the company, praised the efforts of the car crew salesmen in view of the fact that the sale was carried on almost entirely by them, aided by newspaper advertising.

Two-Fare Zone Method in Effect.—The Boston & Worcester Street Railway recently started experimenting on a two-fare zoning system on the Union Avenue line in Framingham, Mass. The fare on this line from Concord Street to Central Square has been 10 cents. The change involves a 5-cent fare from Concord Street to Lakeview Avenue and a 5-cent fare from Lakeview Avenue to Central Square.

Seeks Ten-Cent Fare.—Officials of the Columbus, Newark & Zanesville Electric Railway have petitioned the City Council of Zanesville, Ohio, for permission to charge a 10-cent fare.

Lower Sunday Fares to Beach Resorts.—The Pacific Electric Railway started on April 12 a special round-trip Sunday rate between Los Angeles and nearby beach resorts, including Seal Beach, Long Beach, Wilmington, San Pedro, Redondo Beach, Hermosa, Manhattan, El Segundo, Playa del Rey, Venice, Ocean Park and Santa Monica. The fare is reduced from 70 cents to 50 cents and the change is in the nature of an experiment to determine if opportunity exists for the development of an increased service commensurate with the decreased charge. Tickets will be available for use only on the day purchased and the new plan will remain in force until a decision can be made as to permanent policy.

Provides New Transfer Points.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., announced recently 36 new transfer points on seven trolley routes serving the northern section of the city. These additional free privileges will enable riders to journey between points along Germantown and Wayne Avenues and points on Old York Road for one fare within the city limits.

Youngstown Men Win Trophy.—For operating cars in Youngstown, Ohio, for more than 60 days without a chargeable accident, a team of eight workers was presented a beautiful bronze safety statuette by Isaiah Gordon of the Bureau of Safety, Chicago. Cars operated by these men traveled a distance of 38,477 miles. In winning the trophy the Youngstown team defeated picked teams in Chicago, Milwaukee and Wisconsin.

Fares Reduced.—The Worcester Consolidated Street Railway has made two changes in fare rates to benefit passengers on the Worcester, Clinton and Leominster, Mass., divisions. A change in the zone limits between South Lancaster and Clinton makes the charge between those two points 7 instead of 14 cents. The fare limit has been extended to the post office at Morningdale instead of at Woods switch, making the fare from Worcester to that point 10 instead of 17 cents.

Railway Men Subject of Comment.—The Louisville *Times*, which has been running a series of short biographical sketches of leading business and professional men of Louisville, Ky., recently printed a résumé of the doings of James P. Barnes, president of the Louisville Railway. Another of the sketches dealt with Frank H. Miller, vice-president and general manager of the Louisville Railway.

Approves Operation.—The New York Public Service Commission issued an order on April 16 approving the operation by the Westchester Electric Railroad of its cars in the village of Tuckahoe to the western end of the bridge over the tracks of the Harlem division of the New York Central Railroad. The commission recently approved a declaration of abandonment of part of the line which provided that cars should stop at the eastern end of the bridge. The village later asked the company to operate to the western end of the bridge.

No Single Fare in Twin Cities.—With the session of the Minnesota Legislature about to end there is no prospect of passage of the bill to permit the State Railroad & Warehouse Commission to make a single trolley fare for both Minneapolis and St. Paul. The proposed "metropolitan district" law was killed by the general legislation committee of the House. St. Paul Representatives urged passage of the bill on the gound of simplification of administration and saving of money thereby for the carriers. Minneapolis Representatives objected to the bill because the Minneapolis trolley earnings are greater and the law would penalize patrons of the Minneapolis Street Railway. The Senate refused to advance the bill to a point where it could be reached before the end of the session. For a similar reason, that it will not be reached, the bill is dead that was intended to restore a neutral fare district in the St. Paul Midway, giving Minneapolis a single fare to Snelling Avenue, St. Paul, which it formerly enjoyed. This leaves the median line between the Twin Cities as the end of the single fare on the four interurban lines.

Safety Premium Plan Extended.—The Board of Control of the Richmond Safety Council recently adopted resolutions commending the "safety premium plan" of the Virginia Railway & Power Company. The plan was started last summer and resulted in the distribution of $10,000 to the trainmen just before Christmas of last year. This sum represented one-half of the amount saved by safe operation during the last 6 months of the year. The plan has now been extended for another 6 months. When the plan was started in August, 1924, the company announced that any reduction in the percentage of losses, due to accidents, which amounted to 5 per cent of the gross earnings of $2,400,000 during the first 6 months of 1924 would be divided between the company and the men on a 50-50 basis.

Group Insurance for New Jersey Employees.—All employees who have been in the service of any of the subsidiaries of the Public Service Corporation of New Jersey, Newark, N. J., for a year or more will be eligible for a minimum life insurance policy of $1,000 without physical examination and at a very low rate. Announcement to this effect was made on March 2 by the welfare department of the corporation. The group life insurance plan involves a total insurance of between $15,000,000 and $16,000,000 and affords protection to 12,000 men and women workers.

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Financial and Corporate

Reorganization of Kansas City Railways Ahead

Judge Kimbrough Stone on April 11 announced that May 11 is to be the tentative date for a hearing before him on a final order for foreclosure and sale of the properties of the Kansas City Railways. It is said that this formal step in the reorganization is to be preceded by a hearing on May 1, open to any creditor with rights which have not yet been adjudicated. This hearing is expected to be merely a formality, since the principal creditors and participants in the litigation are said to have approved the language in the decree of sale prepared by R. J. Higgins, attorney for the trustees under the first mortgage.

Senator James A. Reed is said to have taken advantage of the opportunity to urge the setting of definite dates for the hearings. He represents the large personal injury claimants who have settled with the reorganization committee for approximately $2,000,000. The Senator was present at the bus ordinance hearing before Judge Stone on April 20.

The foreclosure order is considered as a preliminary move to a reorganization plan virtually similar to a plan which was drawn up several months ago, but never submitted to the courts for approval. One of the receivers is of the opinion that the railway will probably be turned over to a reorganized company to operate some time in the fall. It is said that a revision of the plan for reorganization will be submitted to the note and bond holders, but this is not expected to be done until after the final order of foreclosure and sale of the property.

Priority of claims against the property will, of course, be established by the order of sale, but interests holding claims which are secondary to those of the large personal injury claimants will still have recourse to their appeal rights and may appeal on exceptions and argue for better settlement terms than those which have already been offered by the reorganization committee.

The holders of the second mortgage bonds made every effort to obtain a better settlement than was at first offered. It is understood that no satisfactory offer of settlement has been submitted to J. Ogden Armour, who loaned to the Kansas City Railways about $1,500,000 just before the receivership. As for the stockholders, the degree of their participation in the affairs of the reorganized company has not been announced.

City of Seattle Must Pay Tax on Railway Properties

In a decision handed down by the United States Circuit Court of Appeals in San Francisco, it was indicated that the city of Seattle, Wash., must pay taxes on street railway properties assessed against the Puget Sound Power & Light Company in 1919. Court attachés and experts expressed inability to interpret the decision closely, but said it indicated that the city would be compelled to pay three-fourths of the tax assessed against the railway, while the company which sold the railway to the city would have to stand the rest. The court specifies that the remaining findings of the lower court will stand.

After a long contest through the lower courts, the company appealed to the United States District Court for an order to prevent the King County Sheriff from placing liens upon the company's property. The petition was dismissed. The company then paid the whole tax under protest, to save from the threatened liens that portion of its properties not affected by the tax. The court refused the temporary restraining order, and the company appealed to the United States Circuit Court. The tax involved and paid by the company under protest was $482,000. Of this sum the company contends that the city of Seattle, under its contract of purchase of the railway, should pay three-quarters.

Increase in Business on North Shore Line

Gross and Net Income Greatest in History of Highly Developed Chicago-Milwaukee System—Comparative Earnings Statement for Nine Years an Instructive Exhibit

EARNINGS of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., showed a substantial increase in 1924 over the previous year. Gross operating revenue was the greatest in the history of the railroad.

While the increase was less marked than in some previous years, the gain of $253,715 in operating revenue may be regarded as very satisfactory, in view of the fact that part of the year 1924 was a period of general business depression, felt in all industries and in all parts of the country.

The steady growth of the company's business since the property came under the present management is best seen by the following comparison of gross operating revenue per mile of road: 1916, $12,688; 1917, $19,203; 1918, $31,798; 1919, $33,278; 1920, $40,558; 1921, $43,528; 1922, $48,472; 1923, $57,498; 1924, $59,962.

INCOME ACCOUNT OF CHICAGO, NORTH SHORE & MILWAUKEE RAILROAD
For the Year Ended Dec. 31, 1924

Operating Revenue:		
Passenger and special car revenue	$5,031,479	
Freight and express revenue	1,048,447	
Miscellaneous revenue	119,060	
		$6,198,986
Operating Expenses:		
Way and structures	483,816	
Equipment	417,566	
Conducting transportation	2,058,972	
Power	534,885	
Traffic	210,408	
General and miscellaneous	944,383	
		$4,650,029
Net revenue railway operation		$1,548,957
Net auxiliary operating revenue		799
Net revenue from operations		$1,549,756
Taxes assignable to railway operations		298,608
Operating income		$1,251,148
Non-operating income		60,154
Gross income		$1,311,302
Deductions from gross income		610,582
Net income		$700,720
Surplus, Jan. 1, 1924		$350,237
Deduct: Sundry adjustments applicable to prior years		17,440
		$332,797
Net income, Jan. 1 to Dec. 31, 1924	$700,720	
Less: Dividends paid	393,300	
		$307,419
Surplus as per balance sheet		$640,216

In 1923 the Chicago, North Shore & Northern Railroad was formed, with a nominal capital stock of $50,000, to acquire a right-of-way and construct a railroad through the Skokie Valley. The stock of the company is held by the Chicago, North Shore & Milwaukee Railroad. It was acquired to protect the railroad from the interruption in service following grade separation work. The company deemed it essential to provide a new outlet for through passenger traffic between Chicago and Milwaukee. The new line will permit the operation of through trains at high speed, reducing the running time between the two cities, in addition to opening up a territory which in the near future should prove a source of considerable traffic. Another advantage of the new line is that freight trains may be operated over it between Evanston and Highland Park. Under present conditions the company is prohibited by ordinance from operating freight trains south of Highland Park.

In June, 1924, the company issued $3,500,000 one-year notes to provide funds for building the line until a permanent plan of financing could be effected.

SALE OF PREFERRED STOCK SUCCESSFUL

At a meeting of stockholders of both companies, held Oct. 6, 1924, a consolidation of the two companies was effected under the name of the Chicago, North Shore & Milwaukee Railroad. In December the consolidated corporation was authorized to issue and sell $7,000,00 first and refunding mortgage 6 per cent gold bonds to retire the $3,500,000 one-year notes, all of the three-year, ten-year and fifteen-year sinking fund notes, and for other corporate purposes. Owing to legal technicalities this could not be consummated until January, 1925, so that the transaction does not appear on the balance sheet in the 1924 report.

The sale of the first issue of $1,500,000 of 7 per cent cumulative prior lien stock to employees and customers, which was launched late in 1923, was brought to a successful close in March, 1924. About 70 per cent of the em-

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COMPARATIVE INCOME STATEMENT OF THE CHICAGO, NORTH SHORE & MILWAUKEE ELECTRIC RAILWAY FOR THE YEARS 1916 TO 1924

	1916	1917	1918	1919	1920	1921	1922	1923	1924
Operating revenue	$1,157,191	$1,751,373	$2,899,975	$3,237,921	$4,193,669	$4,500,805	$5,007,951	$5,945,272	$6,198,987
Operating expenses	714,887	1,114,512	1,856,038	2,319,464	3,229,048	3,440,761	3,777,592	4,464,421	4,650,030
Net revenue—railway operation	442,304	636,861	1,043,937	918,457	964,621	1,060,044	1,230,359	1,480,851	1,548,957
Net auxiliary operating revenue	.....	.....	.....	.....	.....	6,561	8,731	11,444	800
Net revenue from operation	442,304	636,861	1,043,937	918,457	964,621	1,066,605	1,239,090	1,492,295	1,549,757
Taxes assignable to railway operation	66,038	95,680	185,822	163,101	151,746	225,844	248,937	279,448	298,609
Operating income	376,266	541,181	858,115	755,356	812,875	840,761	990,153	1,212,847	1,251,148
Non-operating income	6,208	4,858	9,470	17,879	10,332	11,972	14,560	26,626	60,155
Gross income	382,474	546,039	867,585	773,235	823,207	852,733	1,004,713	1,239,473	1,311,303
Fixed charges	237,996	266,580	332,506	341,396	390,196	463,013	486,784	552,608	610,583
Net income	$144,478	$279,459	$535,079	$431,839	$433,011	$389,720	$517,929	$686,865	$700,720

ployees subscribed for this stock. The balance was sold largely to small investors, customers of the company living in the various communities served by the railroad.

A second issue of $1,000,000 of the same stock was placed on the market in November, 1924, the employees again acting as salesmen and saleswomen. The second issue proved even more popular than the first and the entire issue was considerably oversubscribed in less than three months after the sale opened.

The wide distribution given this stock is shown by the fact that on the day the sale closed officially the subscribers numbered 2,652, of whom 1,489, or 54 per cent, paid cash and 1,163, or 46 per cent, were paying on the monthly installment plan. Stockholders of the company now number 4,768, while subscribers who are paying on the installment plan bring the total to upward of 6,250. The average subscription for prior lien stock is four shares to a subscriber. The company looks upon this wide distribution of stock among the patrons of the line as an important factor in creating good public relations.

Construction work on the new Valley Line, which runs from a junction with the tracks of the Chicago Rapid Transit Company at Howard Street, Chicago, west in the cities of Evanston and Niles Center, and north through the Skokie Valley to a connection with the Libertyville Branch, near Lake Bluff, was commenced early in the spring and pushed toward completion. At the time the report was prepared the line had been completed to Dempster Street in Niles Center, a distance of 5 miles of double track. The first train carrying passengers was run over the line on Feb. 1, from Howard Street to Dempster Street. It has since been opened for traffic.

The program of stone ballasting on the main line was carried on throughout the year. Thirteen miles of right-of-way was inclosed with wire fencing. Automatic substations were built during the year at Berryville, Wis., and Winthrop Harbor, Ill. The following new equipment, part of which was purchased in 1923, was received:

Seven steel passenger coaches, two steel parlor observation cars, one steel dining car, thirteen motor coaches, 29-passenger capacity; one parlor motor coach, two intercity type motor coaches, ten merchandise despatch cars, one Champion snow plow, one reinforced concrete gondola car, one motor derrick car, one single-truck snow sweeper and one steel sub-frame flat car.

A new motor coach route was opened in June between Waukegan and Volo, and in July the route was extended to McHenry. Another route was opened between Waukegan and Antioch.

The educational department is doing a great deal for the morale of the working forces. Classes in English, for foreign-born track laborers; in public speaking, electricity, operation of air brakes and similar subjects were conducted regularly throughout the year, and several educational and social clubs were organized. Private instruction in arithmetic, mechanical drawing, etc., was provided for those who were unable to attend the regular classes. More advanced students were assisted to continue their education in evening classes in various colleges. Employees of the company are now attending seventeen outside educational institutions.

The record shows a reduction of 14 per cent in the number of accidents over the previous year. In accidents to employees, the record shows a reduction of 29 per cent in days of lost time.

A total of 205 safety meetings of employees were held, at which papers on various phases of operation were read by motormen, conductors, shop mechanics, etc. Under the direction of the company's safety engineer and with the co-operation of the bureau of safety, every school in Racine, Kenosha, North Chicago and Highwood was visited and talks on safety made to the pupils. A number of schools in Milwaukee also were visited, about 30,000 school children being reached in this way. In addition, a number of talks on accident prevention were made before civic and parent-teachers' associations.

With the idea of still further improving public relations through employees, cash prizes were offered employees who submitted the best suggestions on how to improve the service, increase the business of the company, effect economies in operation, etc. A total of 810 suggestions were submitted, for which 115 cash prizes aggregating $600 were awarded.

Partial Abandonment Sought at Kingston

The Kingston Consolidated Railroad Company, Kingston, N. Y., on April 22 petitioned the Public Service Commission for permission to abandon all of the route of the former Colonial City Traction Company except that portion along the Strand to Kingston Point. The route of the former Kingston City Railroad, which was merged with the Colonial company in 1901, will be operated without any change, if the petition is approved.

The petition claims that for nearly the entire distance the lines of the Colonial company and the former Kingston City company are so near together that the lines of the Kingston City company are equally convenient for most travelers. It is proposed, however, to establish bus routes to parts of the city not now served by either line. For this purpose the Kingston City Transportation Company has been organized and an application is pending before the Council for approval of such routes.

It is alleged in the petition that for many years the company's revenues have been insufficient to afford an adequate return on the value of its property and that while the Kingston City company lines have paid, the Colonial lines have returned deficits. Last year the deficit on these lines was $15,835. Various rates of fare have been tried without obtaining the desired relief, it was said. The present fare is 8 cents.

Railway Operating Revenues in Milwaukee Well Maintained

The operating revenue of the railway department of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., was $10,390,127 in 1924, representing a decrease of 1.60 per cent compared with 1923. This fact was disclosed in the annual report to the stockholders. For maintenance and depreciation of physical property the percentage of operating revenues for the railway department was 22.22 per cent.

Of the $4,595,074 net capital expenditures for additions to and betterment of property during the year, after deducting replacements and property withdrawn from service, $873,058 was used in the railway utility. The expenditures in the railway utility included principally the construction of 2.7 miles of new track in the city of Milwaukee, betterment of approximately 11 miles of city track, including special work of heavier type to meet the heavier traffic conditions; rehabilitation of interurban lines to permit operation of high-speed passenger coaches, acquisition of additional land and buildings adjoining the company's Cold Spring shop and yard property, construction of utility repair building and addition to Hillside garage at the same location, interurban passenger waiting station and additional passenger and bus equipment.

Of the total authorized amount of $7,000,000 of 7 per cent preferred stock, there has been issued as at Dec. 31, 1924, and sold for cash at par $5,200,200 and $799,800 on the installment

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INCOME ACCOUNT OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY FOR THE YEAR 1924

Operating revenues		$22,559,912
Operating expenses:		
Ordinary operating expenses	$14,169,176	
Depreciation (reserve credit)	1,627,102	
Taxes	1,757,306	
Total operating expenses		$17,553,585
Net operating revenues		$5,006,327
Non-operating revenues		252,884
Gross income		$5,259,211
Interest charges:		
Interest on funded and unfunded debt	$2,454,117	
Interest on depreciation reserve balances	438,978	
Interest on other reserve balances	40,393	
Total interest charges		$2,933,489
Net income		$2,325,721

STATISTICAL DATA OF THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

	1924	1923
Miles of track owned	418.72	413.14
Miles of track leased	1.56	1.56
Miles of revenue track operated	391.08	388.99
Revenue passengers carried	150,857,684	153,626,868
Transfer passengers carried	52,306,065	54,238,201
Per cent transfer to revenue passengers	34.67	35.31
Receipts per revenue passenger	$0.0664	$0.0664
Number of passenger cars owned	870	850
Number of passenger buses owned	107	93

plan, on which partial payments had not been completed. No sales have as yet been made of the stock authorized by the directors under date of Nov. 24, 1924. The company now has approximately 11,500 holders of its preferred stock exclusive of subscribers who have not completed installment payments.

With the exception of the $1,000,000 of additional 7 per cent preferred stock authorized Nov. 24, 1924, the company did no financing during the year. Its cash requirements for construction purposes were obtained principally from the sale of securities heretofore authorized.

In his annual report to the stockholders, John I. Beggs, president, says that the business as a whole during the year was not as favorable as anticipated. The slowing down in industrial activity which occurred in the late spring and continued through the summer months, combined with abnormal weather conditions, had a depressing effect, particularly on the company's railway business. During the latter months of the year there were signs of improvement and indications for the new year are for greater industrial activity.

Suspension Affects Akron Company's Income

The net income of the Northern Ohio Traction & Light Company, Akron, Ohio, in 1924 was less than in the preceding year. This unfavorable showing was due largely to the 27 days suspension of railway service in Akron following the expiration of the local franchise on Feb. 1 and to the generally unsatisfactory rates of fare that were in effect during the greater part of the year. The management succeeded in obtaining increased fares between certain interurban points and increased fares were granted in Akron when the new franchise became effective on Nov. 12. The effect of these increases naturally was not noticeable to any appreciable extent in the 1924 earnings, but should be reflected in the 1925 earnings.

The electric railway lines carried fewer revenue passengers last year than in 1923. This loss is largely accounted for by the suspension of railway service in Akron (the principal city served), from Feb. 1 to 27, 1924, during which time riding on the interurban division also was affected. Comparative figures showing passengers carried for the five years ended Dec. 31, 1924, are shown in the following tabulation:

	Revenue Passengers Carried Rail and Buses	
	City Systems	Interurban Systems
1920	68,903,885	20,876,115
1921	47,799,437	16,820,442
1922	50,632,248	17,117,064
1923	54,112,423	16,784,535
1924	48,563,053	14,588,525

The report states that the company was among the first of its kind to recognize the desirability of buses to supplement urban and interurban transportation service rendered by electric railways. Equipment of this character was added to the transportation system from time to time until on Dec. 31, 1924, the company had 76 buses in operation in conjunction with its city railway service and 35 coaches in conjunction with its interurban service. Steps have been taken further to round out the company's city and interurban transportation system by the purchase of additional buses and coaches and every effort will be made by the management to continue furnishing a high class co-ordinated rail and bus service.

Reference was made in the previous annual report to the suspension of street railway service in Akron on Feb. 1, 1924, when the franchise expired and the basis upon which operations were resumed. A new franchise subsequently was drawn and, upon submission to the voters at the general election on Nov. 4 last, it was approved by a satisfactory majority. The franchise provides for a co-ordinated street railway motor bus

STATEMENT OF EARNINGS OF NORTHERN OHIO TRACTION & LIGHT COMPANY

Gross earnings:	1924	1923
Railway department	$5,364,189	$5,849,877
Electric department	4,716,808	4,255,247
Total	$10,080,997	$10,105,124
Operating expenses and taxes:		
Operating expenses	$7,161,533	$6,986,196
Taxes	741,900	779,400
Total	$7,903,433	$7,765,596
Gross income	$2,177,563	$2,339,528
Interest and other fixed charges	1,441,966	1,310,533
Net income available for dividends and depreciation	$735,596	$1,028,995
Dividends on preferred stock	431,750	412,360
Balance	$303,846	$616,634
Ratio of operating expenses to gross earnings	71.04%	69.14%
Ratio of operating expenses and taxes to gross earings	78.40%	76.85%

SUMMARY OF SURPLUS ACCOUNT NORTHERN OHIO TRACTION & LIGHT COMPANY

Surplus—Jan. 1, 1924		$393,260
Net income available for depreciation and dividends, year ended Dec. 31, 1924		735,596
		$1,128,857
Deduct:		
Appropriation for depreciation	$100,000	
Dividends on preferred stock	431,750	
Dividends on common stock	150,000	681,750
		$447,106
Deduct sundry surplus adjustments		2,031
Surplus—Dec. 31, 1924		$445,074

Conspectus of Indexes for April, 1925

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer

Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares*† 1913 = 4.84	Apr. 1925 **7.26**	Mar. 1925 **7.26**	Apr. 1924 **6.94**	Apr. 1925 **7.26**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	Apr. 1925 **157.3**	Mar. 1925 **158.4**	Apr. 1924 **162.8**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	Apr. 1925 **221.6**	Mar. 1925 **221.5**	Apr. 1924 **217.7**	Sept. 1 20 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5 91	Mar. 31 1925 **4.86**	Feb. 28 1925 **5.28**	Mar. 31 1924 **4.78**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	Mar. 1925 **17.76**	Feb. 1925 **15.67**	Mar. 1924 **16.20**	Mar. 1920 **18.54**	Feb 1922 **10.65**
Business Failures Number	Mar. 1925 **1631**	Feb. 1925 **1651**	Mar. 1924 **1657**	Jan. 1924 **2231**	Sept. 1924 **1277**
Liabilities (Millions)	**35.14**	**41.17**	**64.95**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	Apr. 1925 **209.6**	Mar. 1925 **210.2**	Apr. 1924 **221.6**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Mar. 1925 **161.0**	Feb. 1925 **160.6**	Mar. 1924 **149.9**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	Apr. 1 1925 **13.69**	Mar. 1 1925 **13.84**	Apr. 1 1924 **12.66**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	Apr. 1 1925 **194.5**	Mar. 1 1925 **201.9**	Apr. 1 1924 **186.8**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Mar. 1925 **151**	Feb. 1925 **151**	Mar. 1924 **144**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Mar. 1925 **165.3**	Feb. 1925 **165.3**	Mar. 1924 **163.2**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

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transportation service. It was accepted by the company on Nov. 12, 1924, when it became effective, and will expire four years from that date. It was not deemed advisable either by the public authorities or the management at the time to enter into a long-term franchise containing fixed rates of fare as the next four years are expected to furnish a more reliable guide to future normal prices and means of modern urban and interurban transportation. New rates of fare were established, viz.: 7 cents for single fares, four tickets for 25 cents and seventeen tickets for $1, with free transfer privilege between city street cars and motor buses. These rates compare with a straight 5-cent fare, transfers free, in effect up to Feb. 1, 1924, and a 5-cent fare with 1 cent additional for transfers, in effect from Feb. 28 to Nov. 12, 1924. Provision was made for the elimination of "jitney" and bus competition on streets where the company furnished transportation service, and for the extension of new bus routes under direction of the City Council and by agreement with the company.

First Key System Report

$308,207 Balance to Surplus as Result of First Year of Operation Since Reorganization

The first annual report of the Key System Transit Company, Oakland, Cal., shows that during 1924 the company earned $6.50 on its second preferred stock before federal taxes. The statement covers the full calendar year, the books of the new company having been opened as of Jan. 1, 1924, under the direction of and in accordance with the rules of the Interstate Commerce Commission. There is an explanation of why the franchise amendment recently proposed by the city of Oakland could not be accepted by the company.

During the year, the report shows, the company provided additional service to the extent of 398,382 passenger car-miles, 233,715 bus-miles and 403 ferryboat-miles and transported 2,211,202 additional passengers, as compared with 1923. This additional service cost $226,000, while the increased passenger revenue was only $96,000.

The additional facilities furnished by the company at a net loss of $130,000 were started, the report points out, through desire of the company to improve its service to the people of the East Bay district and with a hope that in a reasonable time the number of patrons would increase sufficiently to pay for the increased cost of service. The operation of the bus service, started during the year on a 6-cent fare with free transfer privileges, is being conducted at an annual loss of approximately $75,000. C. O. G. Miller, president, remarks:

> From the standpoint of the bondholders of the company the earnings for the year are satisfactory. From the standpoint of the stockholders the earnings are inadequate and unsatisfactory. But electric tractions are gaining their place among securities favored by wise and careful investors.
>
> An eminent financial writer recently attributed the revival of the electric railway industry to a number of factors, the most important of which are the abandonment of the rigid 5-cent fare, sane and constructive public regulation, relief from unreasonable taxation and other exactions, which had become obsolete, and finally the force of progressive brain power in management and operation.
>
> There is a place for the gasoline-propelled, rubber-tired vehicle, but not where there is heavy traffic and long hauls. For the greatest convenience and economy the gasoline vehicle should be used in supplementary and feeder service.
>
> This opinion has been verified by the experience of the company during the past year.

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1924

Gross operating revenue		$7,306,574
Operating expenses:		
Way and structures (maintenance)	$467,360	
Equipment (maintenance)	474,785	
Power (maintenance and operation)	691,937	
Conducting transportation	2,776,092	
Traffic expenses	23,607	
General and miscellaneous expenses	636,082	
Transportation for investment and construction overhead (credit)	57,102	$5,012,763
Net operation revenue		$2,293,810
Add net revenue commissary department		142,310
Total net revenue		$2,436,121
*Less taxes		465,975
Operating income		$1,970,146
Add non-operating income		134,059
Gross profit		$2,104,205
Sundry charges:		
Depreciation	$650,960	
Amortization of franchises	8,762	
Abandonment of obsolete equipment	220	659,942
Balance—Current operations		$1,444,263
Deductions:		
Bond interest	$760,781	
Other interest	39,762	
Miscellaneous	22,192	822,736
Surplus—Current operations		$621,526
Profit and loss adjustments		4,984
Surplus		$616,541
Less three quarterly prior preferred dividends paid		308,334
Balance to surplus account		$308,207

*Includes estimated federal income tax for year 1924.

MISCELLANEOUS STATISTICS OF THE KEY SYSTEM TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1924

Passengers Carried:		
Traction Division:		
Cash and ticket fares—6 cents		73,128,336
School tickets—3 cents		1,824,737
Commuters (East Bay cities)		686,831
Miscellaneous—12 cents, 18 cents, etc.		1,279,972
Total revenue passengers		76,919,876
Free transfer passengers		20,802,481
Total revenue and transfer passengers		97,722,357
Key Division:		
18 cents Transbay fares	8,929,072	
Commuters—Transbay	8,155,118	
10-cent school children	221,606	
San Francisco-Sacramento Railroad tickets	251,580	
Miscellaneous Transbay tickets	21,830	
Total Transbay passengers		17,579,206
6-cent fares (East Bay cities)	517,441	
School tickets, 3 cents	46,726	
Total passengers (East Bay cities)		564,167
Total revenue passengers—Key Division		18,143,373
Entire system:		
Revenue passengers		95,063,249
Revenue and free transfer passengers		115,865,730
Average fare, revenue and transfer passengers, Traction Division		4.80c
Average fare, revenue pasengers, Transbay		14.03c
Average number of passengers per day, Traction Division		267,001
Average number of passengers per day, Transbay		48,031
Car Mileage:		
Passenger car mileage	17,826,919	
Freight car mileage	30,725	17,857,644
Car-Hours:		
Passenger car-hours	1,769,515	
Freight car-hours	6,644	1,776,159
Ferryboat mileage		113,728
Motor coach mileage (last quarter of the year)		170,970
Total miles of track operated		266.68

Georgia Interurban Has Net of $12,118 Before Charges

The Atlanta Northern Railway, operating between Atlanta and Marietta, Ga., has reported to the Georgia Public Service Commission net earnings of $12,118 for the year 1924, without making any deductions for interest or other capital charges. Revenue for the year was $247,659, while expenses were $235,540, not including interest on bonds and other charges.

The Atlanta Northern Railway figured prominently in the news some months ago when it suspended operations because of unfair bus competition, tore out a section of track and refused to resume service between Atlanta and Marietta until definite action was taken by the city of Marietta barring jitneys and buses from direct competition with the interurban line. The road won its fight.

Railway Earnings Lower in Springfield, Ill.

For the year ended Dec. 31, 1924, the Illinois Power Company, Springfield, Ill., reports gross earnings from railway operation of $691,386, compared with $711,270 for the year ended Dec. 31, 1923. The number of revenue passengers carried in 1924 was 10,661,451, against 11,150,971 in 1923.

The expenditures made in the railway department during 1924 were largely in connection with the street improvement program which the company undertook when its electric and heating franchises were renewed in August, 1921. The work has been carried on in conjunction with the city's general improvement program. The company's proportion is near completion and expenditures of this character should be substantially less after 1925. Expenditures were also made for equipping seven double-truck cars with standard safety devices so they may be used for one-man operation. In addition the company purchased five 25-passenger buses for operation in connection with street railway service.

The early expiration date (July, 1928) of the franchise under which the company was operated prior to 1924 had hampered the management in financing construction, but a new franchise was granted by the voters at an election held Nov. 4 last. It runs for twenty years.

During the year the Illinois Power Company started a modern bus service in the southeastern and northwestern sections of Springfield. These sections were not heretofore served by street car lines. Free transfers were issued between the street cars and the buses and the extension of the transportation system in this matter has met with the approval of the public.

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Charges Against Northern Ohio Denied

B. C. Cobb, president of the Northern Ohio Traction & Light Company, Akron, Ohio, characterizes as without foundation charges contained in a petition filed at Akron on April 22 by counsel for Walter D. Foss, Wooster, Ohio, asking an accounting, an injunction and other protective measures. Mr. Cobb says the action is not well founded and that it would be difficult to conceive of the preferred stockholders in any number joining in the suit, as the things complained of have been for the benefit of all the stockholders and the properties. The case, he added, will be contested to the limit. Mr. Cobb said:

> The dividends to the preferred stock holders have been paid regularly out of earnings and the reference to the contract contained in the suit relates to the supervision and engineering services, whereby the Northern Ohio Electric Corporation rendered engineering, supervisory and general services in line with the economies of unified operation. Dividends on the common stock have, of course, been paid only out of earnings.

The petition filed in behalf of Mr. Foss names Hodenpyl, Hardy & Company and the Northern Ohio Traction & Light Company, the Northern Ohio Electric Corporation and the Northern Ohio Power Company, organized early this year to take over the assets of the electric corporation. He asserts among other things that the dividends on the common stock, omitted only in 1922, were paid out of capital. He further contends that all payments to the electric corporation, amounting to $3,658,931, were illegal and asks that they be returned; that the agreement relative to engineering and supervisory services entered into between the Northern Ohio Traction & Light Company and the electric corporation be annulled and that officials of the traction company be restrained from making further payments to the holding company; that no more dividends be declared on the common stock and that common stock be not transferred during the litigation.

Surplus in Toledo in March

Operations of the Community Traction Company, Toledo, Ohio, for the month of March reported to the board of street railway control at its monthly meeting by Commissioner E. L. Graumlich showed a net surplus of $6,249 to be added to the stabilizing fund, making the total deficit in that fund now $530,525. Gross revenue in March was $325,511 as compared with $375,407 for the similar month in 1924. Total operating charges, however, in March were $225,519 as compared with $279,989 for the similar month last year.

There were carried in March 4,406,220 revenue passengers as compared with 5,415,974 for the same month last year. There was a decrease in car mileage to correspond with the drop in patronage, and with the effect of higher fare, use of one-man cars and lower power rates the result this year was much better.

Net earnings from operations were 25.591 cents per car mile as compared with 21.153 cents per car mile last year.

Of revenue passengers 62.9 per cent were using tokens selling at three for 25 cents and only 13.1 per cent paid the straight 10-cent cash fare.

New York City Receivership to Be Lifted May 1

May 1 will witness the lifting of the receivership of the New York Railways, New York City. Announcement to this effect was made on April 24 by Joseph P. Cotton, speaking for the reorganization committee. The property which will emerge from receivership includes more than 75 miles of line. It embraces the Broadway-Seventh Avenue, the Lexington Avenue-Broadway, Sixth Avenue, Columbus-Lenox Avenues, Seventh Avenue, Spring-Delancey Streets, Eighth Street, Fourteenth Street, 23d Street, 34th Street, 116th Street routes.

Before the receivership these lines were controlled through stock ownership by the Interborough Rapid Transit Company. That interest has been wiped out wholly and the lines revert to the bondholders and to property owners from whom the New York Railways held leases. After prolonged controversies and litigation, these interests have been largely harmonized in the new concern, the New York Railways Corporation. As indicated previously in the ELECTRIC RAILWAY JOURNAL, the capitalization under the reorganization is reduced from $91,366,445 to $40,163,622. By the abolition of various leases and a complete reorganization of the financial structure of the system, the annual fixed charges have been cut from $2,098,059 to $967,500.

In a statement which he made Mr. Cotton said:

> The lines are able to pay their way largely because of the drastic elimination of fixed charges, but there have been many other economies. The sale of the 50th Street carhouse has enabled us to escape from the heavy taxes and costs of operation there. The abandonment of losing lines, downtown especially, has reduced the property and effected a saving. There have been many other economies. The one-man cars have been the least of these.
>
> The great problem that we face today is the increasing congestion on the streets, but the police are giving us good co-operation, and it is astonishing how rapidly the surface cars get along after all.

The successor company will be headed by Hugh J. Sheeran as president. Mr. Sheeran was operating head of the road under the receivership of the late Job E. Hedges and succeeded Mr. Hedges as receiver.

Purchase of Seattle & Rainier Line Being Discussed

Mayor Edwin J. Brown and eight of the nine members of the City Council of Seattle, Wash., are in favor of purchasing the Seattle & Rainier Valley Railway system, if a fair price can be agreed upon. The Rainier Valley system extends from Fourth Avenue and Stewart Street, through Rainier Valley, and along the west and south shores of Lake Washington to Renton, a distance of approximately 12 miles. It has been appraised at $1,045,547 by the city department of public utilities.

The company has 112,502 ft. of track, or approximately 21 miles. In 1923 the value of the system for rate-making purposes was fixed by the State Department of Public Works at $1,503,788. In the city's compilation, no allowance has been made for franchise values, engineering, legal or general expense, interest during construction discounts or commission, except that an allowance of 5 per cent has been made for engineering and superintendence on the tracks and overhead.

Walter M. Brown, general manager of the Seattle & Rainier Valley line, indicated that the sum set by the city would not be acceptable to the company. He states that in 1922 a valuation report by the State Department of Public Works showed a total value of more than $1,600,000. This figure was based only on such parts of the company's system as are used or useful in its business, and did not include real estate and other property not necessary to the railway operation that would be transferred to the city if a purchase is arranged. Outstanding obligations, including three issues of bonds, aggregate $1,600,000.

About 3 miles of railway are outside the city limits. Under a recent state law, the city has power to maintain and operate a railway 3 miles outside its limits.

Jamaica Railway Receipts Higher

Improved methods of fare collection resulted in a marked increase in the tramway earnings of the Jamaica Public Service Company, Ltd., Kingston, Jamaica, during a period in 1924, when the number of passengers decreased because of a general depression in business and a long drought. Service was improved and there were fewer interruptions. The receipts of the railway department exceeded all previous records and were 8 per cent higher than in 1923. They amounted to approximately 64 per cent of the entire income of the company. Four nine-bench open tram cars were constructed in the company's shops. These cars supply a need for additional equipment to meet the demand for service, particularly during the hours of heavy travel.

The shares of the company are widely distributed and are held by 436 shareholders. Of this number 410 live in the Dominion of Canada, fourteen in the United States, one in England, one in Japan and one in Mexico. There are no shareholders in Jamaica, but the directors have authorized the sale locally of 7 per cent cumulative preference shares "B" in sterling form, the proceeds of which will be utilized for additional improvements to the company's property.

Hearing on Discontinuance Set.—The Indiana Public Service Commission has set April 28 as the date for a hearing at Indianapolis on the petition of the Union Traction Company to discontinue operation of the Anderson-Middletown line.

Increase in Net Income.—For the nine-month period ended March 31, 1925, the total operating revenues of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., were $32,085,954, against $29,463,304 for a similar period in 1924. The operating expenses increased from $19,711,512 to

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$21,081,851 in 1925. The net income advanced from $2,616,208 for the nine-month period ended March 31, 1924, to $3,658,547 for the nine-month period ended March 31, 1925.

Common Stock Issue Approved.—The San Diego Electric Railway, San Diego, Cal., has been authorized by the Railroad Commission to issue and sell at not less than par, on or before Oct. 1, 1925, $2,948,000 par value of its common capital stock and to use the proceeds to acquire a similar amount of outstanding first mortgage 5 per cent bonds, or to exchange the same with the Oceanic Steamship Company, holder of said bonds.

Corporate Income Falls Off.—The passenger revenue of the Brooklyn City Railroad, Brooklyn, N. Y., for the nine months ended March 31, 1925, was $8,458,238 against $8,750,449 for a similar period of last year. The operating expenses and taxes increased, being $7,183,265 for the 1924 period and $7,309,570 for the nine-month period of the present year. The net corporate income fell off. For the nine-month period in 1924 it was $1,479,829 and for the nine-month period ended March 31, 1925, it was $1,083,513.

Improvement in Net Income.—For the first two months of the present year the revenue and income of the Eastern Massachusetts Street Railway, Boston, Mass., was $1,679,378, against $1,720,643 for the similar period of 1924. The expenses and taxes fell from $1,350,292 for the two months of 1924 to $1,295,141 in 1925. Net income, however, showed an increase. It was $141,636 for January-February 1924 and $165,934 for the two months period ended February, 1925.

Preferred Stock Offered.—W. C. Langley & Company, New York, are offering at 95 and accrued dividend to yield 7.36 per cent $1,000,000 of the Iowa Southern Utilities Company 7 per cent cumulative preferred stock. The company operates an electric railway connecting Centerville, Mystic and Albia in Iowa and the local railway in Burlington. The purpose of the issue will be to apply the preferred stock to the retirement of an equal principal amount of notes.

Seeks to Abandon on State Street.—The San Diego Electric Railway, San Diego, Cal., has applied to the Railroad Commission for permission to abandon service on its line upon State Street between Broadway and E Street and to take up its tracks. The company desires to operate a bus service in lieu of car service over this abandoned portion.

Deficit for Nine Months.—For the nine-month period ended March 31, 1925, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., was $43,811,225, representing an increase of $590,879 over a similar period ended March 31, 1924. The operating expenses, taxes and rental paid the city for the old subway amounted to $29,028,299, or a decrease of $302,143 over a similar period a year ago. The balance, after actual maintenance, showed a deficit of $129,193, or an increase over the nine-month period ended March 31, 1924, of $702,888.

Car Trust Bonds Offered.—The Union Trust Company, Pittsburgh, Pa., is offering at prices ranging from 101 and interest to 101½ and interest, to yield from 4.95 per cent to 4.85 per cent, according to maturity, $1,200,000 of 6 per cent car trust gold bonds, series B, of the Pittsburgh Railways. The bonds are to be issued in part payment for 103 new standard semi-steel passenger street cars, the cost of which will be more than $1,505,000, or 25 per cent in excess of the full amount of these bonds. The title to the equipment is to be vested in the trustee under lease to the company at a rental sufficient to pay these bonds and the interest and other charges as they become due. Following is a description of the cars: twenty semi-steel, single-end, center-entrance, low-floor, double-truck, multiple-unit interurban cars; 83 semi-steel, single-end, center-entrance, low-floor, double-truck, multiple-unit city cars.

Railway Properties Suffered in 1924.—In its annual report for 1924 the Dominion Power & Transmission Company, Ltd., Hamilton, Canada, states that its railway properties felt the depression of the year 1924 more severely than other branches of the business. This result was partly due to the various forms of automobile travel, particularly increased use of the private car. In common with business of nearly all kinds the company, according to President Moodie, had a disappointing year. The Dominion Power & Transmission Company controls and operates the Hamilton & Dundas Street Railway, the Hamilton Radial Electric Railway, the Hamilton, Grimsby & Beamsville Electric Railway and the Brantford & Hamilton Electric Railway.

Surplus, $9,689.—For the year ended Dec. 31, 1924, the total income of the California Railway & Power Company was $33,092. This fact was disclosed in the twelfth annual report to the stockholders. The California Railway & Power Company owns all the stock of the San Francisco Electric Railways and a substantial amount of the stock of the Market Street Railway. The total expenses for the year were $15,052, with a net income of $18,040. There was a deficit at the beginning of the year of $8,351 and a surplus Dec. 31, 1924, per balance sheet of $9,689. The report contains the income and profit and loss statement as well as the balance sheets of the California Railway & Power Company and the Market Street Railway.

Utilities Report Submitted.—The valuation of the Los Angeles Railway, Los Angeles, Cal., is practically completed. The valuation of the Pacific Electric Railway is approximately 50 per cent finished. From all indications the joint report will not be ready before Jan. 1, 1925. These statements were made in the fifteenth annual report of the Board of Public Utilities of the city of Los Angeles for the period from July 1, 1923, to June 30, 1924, submitted to the Mayor and City Council. In addition to comment on the unification survey the report discusses railway extensions made during the past year in Los Angeles, the subject of power shortage and the matter of crossing protection and elimination. In addition a comparative table of electric railway transportation rates in various cities for the year 1923-1924 is given. A section of the report deals with motor vehicle transportation. It estimates the increase in number of drivers in 1924 over 1923 and in the number of vehicles used in this method of transportation. The report states that no legislation of importance affecting the powers and duties of the Board of Public Utilities was enacted during the fiscal year covered by the report.

Seeks to Abandon a Line in Fredonia.—The Buffalo & Erie Railway, which operates between Buffalo, N. Y., and Erie, Pa., has applied to the Public Service Commission for permission to abandon its local line in East Main Street, Fredonia. The company says this short local line does not pay operating expenses. The company has increased its service between Fredonia and Dunkirk, giving a twelve-minute schedule instead of fifteen minutes. A revised interurban service west of Fredonia also went into effect on April 15.

Crape for Last Trip.—The Kentucky Utilities Company, Somerset, Ky., discontinued service on April 3. The City Council released the company from further operation, its franchise having only until Aug. 1 to run. The company paid the city $2,500 to remove rails and ties. On their last trips the two street cars carried huge bows of black crape at both the front and rear ends. Somerset is a city of 5,000 population. The railway consisted of 3.3 miles of track.

Bus Line Price $200,000.—After a hearing before the Maryland Public Service Commission, the Baltimore Transit Company, a subsidiary of the United Railways & Electric Company, took over the ownership and operation of the East Fayette Street Bus Company. The price agreed upon was $200,000. The Baltimore Transit Company plans to improve the service of the line. In a balance sheet of Feb. 25, 1925, the East Fayette Street Bus Company listed assets under book value as garage, land and building, $20,000; buses and equipment, $143,568; gasoline tanks, $1,845; office fixtures, $728, totaling $166,141. Additional assets listed were good will and franchise, $46,500; cash, $5,534; discount on capital stock, $8,000; prepaid licenses, $5,812; unexpired insurance premiums, $428. The total assets were given as $233,401. Other details of this bus sale were given in the ELECTRIC RAILWAY JOURNAL, issue of March 21, page 488.

Deficit in February.—Deficit of the Youngstown Municipal Railway, Youngstown, Ohio, in February was $7,477, according to Traction Commissioner Engle. The February deficit followed two months in which the railway showed the first profits since the service-at-cost franchise became effective. The report showed gross revenue of $169,658 and total actual cost of operation of $177,135. Of the total earnings $127,924 was from railways and the balance from buses. Cars and buses during the month carried 2,783,069 passengers over a distance of 445,644 miles. The total deficit in the stabilizing fund is now $1,242,422.

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Personal Items

Adrian Hughes, Jr., in Operating Post

Baltimore Official to Represent Mr. Palmer in Bus Affairs—Mr. Wennagel Has Added Responsibility

Adrian Hughes, Jr., superintendent of power of the United Railways & Electric Company, Baltimore, Md., has been made superintendent of bus transportation in direct charge of the operation and maintenance of all of the company's bus lines. George F. Wennagel, assistant superintendent of power, will have direct charge of the power department, but Mr. Hughes will retain general supervision of the department in a consulting capacity.

The appointment of Mr. Hughes to have general supervision of bus operation was occasioned by the broadening

Adrian Hughes, Jr.

and enlarging of the company's bus activities. As an additional officer in that department Mr. Hughes will relieve L. H. Palmer, vice-president and general manager of the company, of some of the details of the bus work and at the same time give the bus operations technical supervision. W. E. Martin, superintendent of the Baltimore Transit Company, the bus operating subsidiary, continues with the company. His status, it is understood, remains unchanged, except that Mr. Hughes will represent Mr. Palmer direct. Mr. Martin is not an engineer.

Mr. Hughes has been connected with the company at Baltimore since 1914. He entered its employ as an engineer in the distribution division of the power department, and in August, 1918, was made assistant to the superintendent of power in charge of the power stations. Not quite two years later, on May 1, 1920, he was made superintendent of power. Mr. Hughes began his professional career with the electrical department of the Edgar Thomson Steel Mill of the Carnegie Steel Company at Pittsburgh in July, 1912, where he had worked during several summer vacations. In November, 1912, he was made general foreman of the electrical department of the works and went from the works to the railway. He was born in Baltimore, was graduated from Rock Hill College, Maryland, in 1908 with an A.B. degree and from Cornell in 1912 in electrical engineering.

Mr. Wennagel entered the service of the railway in December, 1906, in the lines and cables division of the power department. Six years later he left the railway to become assistant engineer with the electrical commission of Baltimore and remained in that position until Dec. 31, 1917. He then re-entered the service of the railway as an engineer in the power department, and subsequently was appointed assistant superintendent of power. Mr. Wennagel was born in Baltimore, on Jan. 14, 1887. He was graduated from the Baltimore Polytechnic Institute in 1906. For a number of years thereafter he served as instructor in mathematics and electricity at one of the local evening technical schools. In 1906 he went with the Chesapeake & Potomac Telephone Company of Baltimore, working for that company about three months in the office of the plant engineer. He resigned from the telephone company to take a position as inspector of construction work with the Electric Commission of Baltimore.

E. A. West Appointed to Salt Lake

Edward A. West, general superintendent of the Denver Tramway, Denver, Col., with which he has been connected for the last nine years, will succeed Henry F. Dicke as general manager of the Utah Light & Traction Company, Salt Lake City, Utah. Prior to his appointment to the Denver Tramway Mr. West was on the executive staff of the Portland Railway, Light & Power Company, Portland, Ore., now the Portland Electric Power Company.

S. S. Crane Advanced

The recent purchase of the Altoona & Logan Valley Electric Railway, Altoona, Pa., by A. E. Fitkin & Company, New York, has been followed with the promotion of S. S. Crane, general manager, to operating vice-president in addition to general manager. In 1921 Mr. Crane celebrated his twenty-fifth anniversary with the Altoona & Logan Valley property. He began his business career as a train inspector for the Pennsylvania Railroad at Harrisburg. In 1892 he was made assistant trainmaster for the Pennsylvania at Altoona. Three years later he resigned to become general manager of the Altoona & Logan Valley Electric Railway. At one time he was in charge temporarily of the Johnstown Traction Company, Johnstown, N. Y. With the aid of Lee T. Shannon he rehabilitated that property, dividing his time between the Johnstown and Altoona properties.

Henry F. Dicke Goes to Allentown

Henry F. Dicke, for the past eight years general manager of the Utah Light & Traction Company, Salt Lake City, Utah, will, on May 1, become assistant to the president of the Lehigh Valley Transit Company, operating between Allentown and South Bethlehem, Pa.; vice-president of the East Penn Electric Company, Pottsville, and vice-president of the Williamsport Passenger Railway, Williamsport, Pa. His headquarters will be at Allentown.

Mr. Dicke is a native of Fort Wayne, Ind. In 1899 he entered the service of the Fort Wayne Traction Company in the accounting department, where he served for a period of five years. He resigned that position to become general auditor of the Ohio & Indiana Construction Company. This company was formed to build a 65-mile line from Fort Wayne to Lima, Ohio. During this construction work Mr. Dicke de-

H. F. Dicke

voted some time to the engineering department and became superintendent of construction. When the work was completed he was placed in charge of operation of the property owned by the Fort Wayne, Van Wert & Lima Traction Company, which later, with several other properties, merged with the Ohio Electric Railway.

For seven years he had charge of operation of the northern division of the Ohio Electric Railway, consisting of 242 miles of interurban lines, and then resigned to go to Boise, Idaho, as general manager of the Boise Valley Traction Company. He served in this capacity for five years, and was then made general manager of the Utah Light & Traction Company at Salt Lake City, which position he is now leaving to take up his duties with the Pennsylvania companies.

Edward T. Chapman, formerly secretary of the Connecticut Company, New Haven, Conn., has been elected to succeed the late Victor S. Curtis and will have the title of secretary-treasurer. Mr Chapman has been with

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the Connecticut Company since 1902, starting as local cashier at New Haven, Conn.

Messrs. Collins and Reichart Advanced

J. C. Collins has been appointed treasurer of the electric corporation and H. L. Reichart secretary and treasurer of the railways at Rochester, N. Y. Following this the financial offices of the Rochester Gas & Electric Corporation and the New York State Railways were transferred to Rochester from the New York City offices of the New York Central Railroad.

Mr. Reichart, formerly assistant secretary of both companies, becomes local secretary and treasurer of the New York State Railways. He will act for the railway's property and subsidiaries in Rochester, Syracuse and Utica and interurban lines. He fills the vacancy caused by the death of M. S. Bargar, formerly general treasurer of the New York Central, and all properties it controls. Mr. Reichart has been assistant secretary of the New York State Railways since 1913 and has been with the company since 1909.

Mr. Collins formerly served as secretary and assistant treasurer of both companies. He will have executive control of the financial affairs of the power concern.

Southern Pacific Announces Staff Changes

The executive offices of the Southern Pacific Company will be transferred from New York to San Francisco on May 31. The change involves the concentration in California of control, purchasing and contracting. The active jurisdiction of the president, William Sproule, will be extended to cover company operations in Texas and Louisiana. Paul Shoup, vice-president, will take charge of management and operation. Mr. Shoup is president of the Pacific Electric Railway and an officer of other electric railway properties controlled by the Southern Pacific.

W. B. Arnette is purchasing agent of the Nashville Railway & Light Company, Nashville, Tenn., succeeding the late H. B. Stubblefield.

Charles E. Dove has been made manager of the Dubuque Electric Company, Dubuque, Iowa. This position was formerly held by Thomas Parker.

L. E. Curry, for the past twelve years electrical engineer of the Michigan Electric Railroad, with headquarters at Jackson, Mich., recently resigned his position to become connected with the Drew Electric & Manufacturing Company at Cleveland, Ohio.

H. A. Siggins has succeeded the late D. H. Siggins as president of the Union Traction Company, Coffeyville, Kan. L. L. Francis, formerly electrical engineer, is now secretary and manager. L. C. Smith, who formerly had the title of secretary, is now treasurer, the title previously held by H. A. Siggins. Homer Hawkins is now master mechanic. He replaced O. L. Siggins in that capacity.

Mr. Vargas Executive Assistant

Comptroller of Key System Transit in New Post — Other Recent Key Appointments

Chester C. Vargas, comptroller of the Key System Transit Company, Oakland, Cal., and newly appointed assistant to the president of that company, entered the service of the Key System in July, 1912, as payroll extension clerk in the auditing department, at a salary of $35 a month. After occupying various positions in the auditing department he resigned as chief clerk in that department in July, 1918, to accept a position as auditor with the capital issues committee in Washington, D. C.

When this committee dissolved in December, 1918, Mr. Vargas accepted the position of disbursing officer for the War Risk Insurance. There he remained until July, 1920. He then returned to California as auditor for the Mercantile Trust Company.

In January, 1922, he returned to the Key System as comptroller, being made assistant to the president on March 16, 1925, in addition to retaining his duties as comptroller.

C. C. Vargas

Mr. Vargas was born on Dec. 25, 1892, in Lemoore, Kings County, Cal., and attended grammar and high schools in Nevada. Returning to California, he entered the University of California night school and took courses in accounting and in finance, and supplemented this work with studies in a business college, and by correspondence.

E. Floyd Smith, the new assistant manager of the bureau of public relations of the Key System Transit Company, entered the service of the company as a conductor in 1892. In 1901 he was made a clerk in the general offices and in 1903 was appointed cashier, in which position he has continued up to the present time.

Since the announcements were made by President C. O. G. Miller of the promotion of Mr. Vargas and Mr. Smith, H. P. Bell, electrical engineer, has been made chief engineer, reporting to the general manager; H. B. Murdock has been promoted to the position of civil engineer in charge of all mechanical matters with direct supervision over the maintenance of rolling stock and floating equipment, reporting to the chief engineer; and D. L. Babcock has been made engineer in charge of overhead lines, power and its sources, signals and other electrical operations, reporting to the chief engineer.

Obituary

E. J. Triay

Eduardo J. Triay, receiver of the Jacksonville Traction Company, Jacksonville, Fla., since October, 1920, died on April 3, 1925. In that post his work was conspicuous. He had no previous experience in electric railway work, but he did possess great executive ability.

The company at Jacksonville had been in bad shape financially for a long time before Mr. Triay took charge. He immediately made plans for its betterment with the result that today the company has very largely, if not quite, recovered the lost ground of the war-time period. Together with the local manager, J. P. Ingle, formerly an electric light commercial manager, Mr. Triay applied intensive merchandising methods. Largely through the efforts of Mr. Triay the company now has 75 per cent new equipment, including cars and parts.

Mr. Triay's death removes one of the few remaining pioneers of Jacksonville of more than 50 years ago. He always will be remembered as a man of fine character, of strong personality and great love and devotion to Jacksonville and to Florida. For many years he was a prominent figure in the politics of the state. A personal friend of the late Henry Morrison Flagler, owner and developer of the Florida East Coast Railway, Mr. Triay was for some years general agent of that property.

Mr. Triay was born in Cardenas, Cuba, on Aug. 16, 1852. He went to Jacksonville in 1870.

H. H. Lloyd

Harry H. Lloyd, purchasing agent for the Indianapolis Street Railway and the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., died on April 21. Mr. Lloyd entered traction service with the Rhode Island Company, now the United Electric Railways, Providence, R. I., as a stenographer in the office of Robert I. Todd, then the president of that company. When Mr. Todd became president of the Indianapolis Street Railway Company and the Terre Haute, Indianapolis & Eastern Traction Company in 1905, Mr. Lloyd went to Indianapolis with him. For a long time Mr. Lloyd was secretary to Mr. Todd. After filling this and other posts most acceptably he was appointed purchasing agent six years ago. At the time of his death Mr. Lloyd was chairman of the committee on purchases and stores of the American Electric Railway Association and a member of the committee on co-operation between manufacturers and electric railways. Mr. Lloyd was born in Manchester, England, 42 years ago.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

New Motors and Trucks to Replace Old Equipment

An order has been placed by the New York State Railways for 270 motors and trucks to replace old, obsolete equipment. Of these 204 will be used on the Rochester Division and 66 on the Utica Division. The motors will be General Electric, type 275-A, of 60 hp. capacity. The trucks will be Brill, type 39-E1. The new equipment when placed under cars will weigh complete from 35,000 to 37,000 lb. This is a saving in weight of from 15 to 20 per cent over the original equipment, which consisted of four motors per car. The new equipment provides only two motors per car. Wheel diameters have been reduced from 33 in. to 28 in. for driving wheels and 22 in. for pony wheels. Calculations indicate that the decrease in power and maintenance cost will pay for these equipments in four years. Delivery will start about June 1.

Belgian Concern to Manufacture Ingersoll-Rand Oil Engine

A connection of significance to the engineering world has lately been arranged between Carels Brothers of Ghent, Belgium, and the Ingersoll-Rand Company of New York City by which the Belgian concern will have the right to manufacture the well-known Ingersoll-Rand solid-injection type of oil engine.

Carels Brothers was organized in 1875 and has long enjoyed a prominent place in the industrial life of Belgium. Today, after successive periods of expansion, Carels Brothers is officially known as the Société d' Electricité et de Mécanique. Carels Brothers was among the first of the European licensees to work under the Diesel patents and Carels-Diesel engines have won wide recognition in many fields of service because of their excellence.

United States Prepares Industries' Statistics

The United States Department of Commerce is now preparing statistics for some 25 industries. Meantime, other industries are urging that the Department of Commerce do statistical work for them also, and there are no funds available. The question has arisen of the legality of the department to go ahead with the work and let the individual industries bear the cost thereof. The department, it is understood, feels that this statistical work could be better done by trade associations, but the question of legality has made many industries doubtful of performing on their own account this essential work, and makeshifts have to be employed pending further determination by the courts or Congress of the status of statistical trade information.

Will Experiment with Model Bus in Detroit

A model double-deck coach built on specifications drawn up by the Detroit Department of Street Railways, Detroit, Mich., has been delivered to the department by the Yellow Coach Manufacturing Company, Chicago. This model coach will be experimented with in forming a basis for recommendations for the purchase of a fleet of double-deck buses for service in Detroit. Last year the City Council refused to carry out the Street Railway Commission's recommendation relative to purchasing double-deck buses from the Chicago company. The coach just received for demonstration is built in accordance with the specifications of the D. S. R., which were outlined at that time and which the Detroit manufacturers recommended but some of the Councilmen did not agree to follow.

Requests for bids for buses to be purchased were withdrawn by the commission and the department began renting equipment from the Detroit Motorbus Company and purchasing single-deck buses from Dodge Brothers, Inc., Detroit manufacturer. At the present time the department reports that 83 buses are in operation, including eight rented from the Detroit Motorbus Company and 75 obtained from Dodge Brothers. Considerable mileage is already covered by motor coach routes in outlying sections of the city and connecting with street railway lines.

It is the intention of Ross Schram, general manager of the Detroit Street Railway, to use a fleet of double-deck buses when they are acquired by the city to supplement service on the main trunk lines. The type of bus which is now being demonstrated is fully inclosed, lighted and heated on both decks, with leather seats.

Six-wheel buses are being studied, and if it is decided by the D. S. R. that that feature is desirable it is believed that six wheels can be put on the coaches the D. S. R. buys at little additional expense. Electric-gasoline power plants are also being considered favorably by the D. S. R., although the new bus has a six-cylinder gasoline motor.

It has been announced by Mr. Schram that express stops by the street cars and local stops by the buses on the main trunk lines of the D. S. R. are contemplated. It is also planned that on some streets, where local conditions call for it, the coaches will make the express stops and the street cars the local stops. Only seated passengers would be carried on the buses and "Pullman" service would be supplied for those passengers who wish to pay the higher fare of 10 cents.

Changes in Westinghouse Railway Department

Two members of the railway sales department of the Westinghouse Electric & Manufacturing Company at East Pittsburgh have recently been transferred to field positions.

M. Kennedy, formerly section manager in the light traction division, is now in the transportation division of the Philadelphia office. Mr. Kennedy was graduated from Washington University, St. Louis, with a bachelor of science degree in electrical engineering. He enrolled with the Westinghouse Company in 1916 in the graduate student course. Following the completion of the student course he went to the substation section of the power department and thence to the International Company, with which he remained until 1920, when he transferred to the railway department in charge of light traction negotiation work for foreign fields. Later, Mr. Kennedy was appointed to the position he held at the time of his transfer. He served in the army during the war.

The other transfer is that of L. E. Lynde from the heavy traction division at East Pittsburgh to the transportation division of the New York office.

Immediately after he was graduated from the University of New Hampshire with a B. S. degree in electrical engineering Mr. Lynde entered the army, where he remained for two and a half years. Eighteen months of this time was spent in France and Germany.

In 1920 Mr. Lynde went to the Westinghouse Company, and after completing the graduate student course, went immediately to the heavy traction division. In that department he has been closely associated with all of the important steam railroad electrifications. Prior to his college days Mr. Lynde was employed by the Massachusetts Northeastern Railway during vacation periods.

Canadian Electrification Work Progressing

The electrification of the Grand Trunk Railway between Port Dalhousie and St. Catharines, Ont., Canada, is proceeding. This work is part of the plan of the Canadian National Railways to run fast electric trains from Port Dalhousie to Niagara Falls, Ont.

Metal, Coal and Material Prices

Metals—New York	April 21, 1925
Copper, electrolytic, cents per lb	13.337
Copper wire base, cents per lb	15.375
Lead, cents per lb	8.05
Zinc, cents per lb	6.85
Tin, Straits, cents per lb	52.75
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.30
Somerset mine run, Boston, net tons	2.025
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.50
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.06
White lead in oil (100-lb. keg), N. Y., cents per lb	0.157
Turpentine (bbl. lots), N. Y., per gal	0.99

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Rolling Stock

Altoona & Logan Valley Electric Railway, Altoona, Pa., will spend $175,000 for the purchase of new trolley cars, ten of the 48-passenger type and five of the 24-passenger one-man type.

Madison Railways, Madison, Wis., has purchased two additional buses for relief or charter service.

New Brunswick Power Company, St. John, N. B., is constructing at its own shops in St. John two new cars of the one-man type. These are the first cars other than sweepers and work cars to be constructed in the company's shops. Besides the two new cars, one of the old cars has been remodeled.

Key West Electric Company, Key West, Fla., will operate four Mack 230½-in. bus chassis recently ordered by Stone & Webster. These chassis will be mounted with special 29-passenger city-type bodies built by the American Car Company, St. Louis.

Alabama Power Company, Montgomery, Ala., bought five cars from the defunct Selma Electric Railway for use in the Montgomery division.

Track and Line

Wisconsin Power & Light Company, Oshkosh, Wis., has completed plans for the addition of about 1¼ miles of single track to its railway in Sheboygan.

Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., has appropriated $200,000 for the equipment of the extension of the Fourth Avenue subway from 86th Street to 95th Street, Brooklyn.

Municipal Railway, San Francisco, Cal., has awarded a contract for the construction of Ocean View car line track and paving to the firm of Eaton & Smith.

Shreveport Railways, Shreveport, La., has authorized the A. C. Steere Company to construct approximately 1⅛ mile of line through Broadmoor, a suburb. The extension will cost about $100,000.

Altoona & Logan Valley Electric Railway, Altoona, Pa., recently purchased by A. E. Fitkin & Company, New York, plans to spend $200,000 this year in paving and trackwork.

British Columbia Electric Railway, Vancouver, B. C., it is reported, proposes to spend about $350,000 on improvements to its Vancouver Island properties during the year.

Stockton Electric Railroad, Stockton, Cal., will petition the City Council for a franchise for an extension of its Tuxedo Park line over Kensington Way to the College of the Pacific.

Key System Transit Company, Oakland, Cal., is working on the rebuilding of the track on Broadway between Tenth and Twelfth Streets, Oakland. The piece of track is being reconstructed with standard girder rail at a cost of $13,000.

Wisconsin Public Service Corporation, Green Bay, Wis., is preparing plans to build a track extension of 2,500 ft. and paving to its railway in Manitowoc.

Edmonton Radial Railway, Edmonton, Alta., Canada, it is reported, has submitted revised estimates for the construction of an extension along Portage Avenue. The original estimate was for $29,000, but the present one is for $38,950.

Power Houses, Shops and Buildings

Jamestown Street Railway, Jamestown, N. Y., plans to erect an automatic substation in the East End, to cost $50,000.

Boston Elevated Railway, Boston, Mass., is to start work at once on a heating plant to be erected on Surrey Street, Medford, Mass. Plans call for a one-story brick, steel and concrete building, 24 x 59 ft.

South Carolina Gas & Electric Company, Spartanburg, S. C., has renovated the garage on West Broad Street so as to use it to house the company's fifteen buses. The garage will have approximately 11,800 sq.ft. of floor space. A well-equipped repair shop will be provided.

Hartford & Springfield Street Railway, Warehouse Point, Conn., plans a terminal on Worthington Street, Springfield, Mass., for the accommodation of its bus service.

Trade Notes

Linde Air Products Company, New York, N. Y., manufacturer and distributor of oxygen for welding and cutting, has recently opened the following new district sales offices: 716 First National Soo Line Building, Minneapolis, Minn., C. E. Donegan, district sales manager; 409 Lincoln Life Building, Birmingham, Ala., W. A. K. Kopp, district sales manager; 508 Exchange National Bank Building, Tulsa, Okla., G. D. Grubb, district sales manager. The Linde company also announces the appointment of J. W. Foster as district sales manager at Baltimore. Prior to this appointment Mr. Foster was a senior salesman in the Pittsburgh Linde district.

Lawyer Railway Equipment Corporation, Syracuse, N. Y., has been chartered at Albany with $50,000 capital to manufacture railway equipment. F. A. Lawyer, G. E. Broan, 340 West Fayette Street, and C. A. Scriber, 617 East Fayette Street, Syracuse, N. Y., are the directors and subscribers.

General Electric Company, Schenectady, N. Y., received orders for the three months ended March 31, comprising the first quarter of the present year, amounting to $83,846,236, compared with $73,487,903 in the same quarter of 1924, according to an announcement by President Gerard Swope.

Yellow Coach Manufacturing Company, Chicago, Ill., announces the appointment of Francis J. Fox as sales representative for Yellow coaches in Iowa, Illinois, Chicago and St. Louis. Mr. Fox was formerly sales agent in Chicago and surrounding territory for the Griffin Car Wheel Company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has opened a branch office in Davenport, Iowa, locating temporary quarters in the Central Office Building. This branch may be located in the new headquarters building of the United Light & Power Company on completion of this structure late this year. D. R. Irvin, a graduate of Purdue University, with several years of service in the Westinghouse organization, has been placed in charge of the Davenport branch as district manager. The branch will cover the territory on both sides of the Mississippi River from Dubuque, Iowa, and the northern line of Illinois to Quincy, Ill., and Hannibal, Mo.

The Gould Coupler Company and the **Gould Storage Battery Company, Inc., New York, N. Y.,** have removed their offices from 30 East 42d Street to 250 Park Avenue, New York City.

C. B. Harvey, formerly branch manager of the Philadelphia territory for the complete line of Lapeer semi-trailers, has been appointed distributor for this same territory.

New Advertising Literature

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has reprinted in folder form an editorial which appeared in the ELECTRIC RAILWAY JOURNAL, Nov. 22, 1924, under the heading "Standardization of Contact Line Should Further Electrification." The editorial discussed the importance of adopting a common system of current supply in the progress of railroad electrification. To this discussion has been added comments on the editorial pointing out another factor to be considered. This added factor is the available power supply possible from public utility power companies, thereby relieving the railroads from heavy capital expenditures for electric power generating equipment.

Engberg's Electric & Mechanical Works, St. Joseph, Mich., has issued a new catalog, No. 105, on Engberg direct-current direct-connected generating sets. It is illustrated and contains 32 pages.

Garford Motor Truck Company, Lima, Ohio, has issued a sixteen-page illustrated pamphlet showing the developments which have been made by it in producing motor coaches.

Nichols-Lintern Company, Cleveland, Ohio, has issued a pamphlet entitled "Two Safety Ideas for Your Cranes."

Electric Railway Improvement Company, Cleveland, Ohio, has issued a new and comprehensive bulletin describing its line of arc weld rail bonds. This bulletin is known as Circular No. 13 and gives detailed information, including actual dimensions of the size, of arc weld bonds and their manufacture; illustrated data on the most efficient bonding procedure, and data on welding currents and welding rod. Copies are sent gratis on request.

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 23 and bulletin No. 2071 on safety hand lamps.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 2, 1925 *Number* 18

Operating Results for 1924 Indicate a Good Year in 1925

STATISTICS of electric railway operation in 1924, compiled by the American Electric Railway Association and made public this week, give much food for thought. The survey covered about 85 per cent of the gross business of the industry. The 370 companies included in the tabulation showed total operating revenues of $786,530,422, against $794,257,546 in 1923, a decrease of slightly less than 1 per cent. Far from being an unfavorable showing, this was better than might well have been anticipated in view of the industrial depression that lasted the greater part of the year. In his analysis of the situation E. J. Murphy, statistician of the association, compares the practically stationary traffic on the electric railways last year with a decrease in iron and steel production of 22.2 per cent, in automobile production of 10.3 per cent and in the Federal Reserve Board index of production of 22 basic commodities of 10 per cent. Even in the transportation business, freight car loadings fell off 2.6 per cent, and revenues of Class I steam railroads showed 5.9 per cent less gross.

With electric railway traffic, particularly in the industrial regions, sensitive to changes in business conditions, the result is quite remarkable. It shows in no uncertain manner the fundamental soundness of the industry and points the way clearly to an increase in business for the current year, with greatly improved business conditions.

On the other side of the ledger, there was also a slight reduction. The 370 companies had operating expenses of $581,288,567, against $584,674,342 in 1923, or 0.58 per cent less. This was not quite enough to offset the loss in revenue, as net operating revenue was 2.07 per cent off from the 1923 figure. As there was very little change in the indexes of costs during the year, this would indicate slightly less efficient operation.

With conditions for the first four months of this year at least as good as those of 1924, and no national political campaign approaching, it would appear that 1925 bids fair to be the banner year of the electric railway industry.

Certain Services Are Natural Monopolies

WHEN public utility companies advance the argument that unnecessary duplication of service is an economic mistake, and that unregulated competition in these industries is wasteful, some people are prone to assert that this is merely selfish propaganda. As a matter of fact certain services are natural monopolies and can function most satisfactorily when free from competition. An example which proves the truth of this contention is the action of the government in forbidding private competition with the postal service.

The United States government claims the sole right to carry letters and packets. Congress has passed laws imposing fines and imprisonment upon those who "shall establish any private express for the conveyance of letters or packets, or in any manner cause or provide for the conveyance of the same by regular trips or at stated periods, over any post route—or from any city, town, or place to any other city, town, or place between which the mail is regularly carried." Clearly the purpose of this statute is to prevent private competition with the postal service. The constitutionality of the act has been upheld by the Supreme Court. The reasonableness of it commends itself to all thinking people. Intolerable confusion would result if three or four different agencies were to undertake to do this work.

The same argument has equal force in connection with other services such as water supply, telephones, or transportation. Competition means confusion and waste. Through public service commissions or other similar bodies, the people exercise control over the utility companies as closely as, or more closely than, they do over the post office. If the latter can give better service when protected from destructive competition, so also can the utility companies. This fact is becoming more and more widely recognized, but constant reiteration of it appears to be necessary to counteract the efforts of the demagogues and local politicians.

Inflexible Operating Rules May Injure Electric Railway Service

DESPITE the lack of compelling necessity, there is sometimes a tendency to hamper electric railway operation with absolutely iron-clad and inflexible rules. Certain minimum requirements must be insisted upon for the sake of safety. Beyond that point it is desirable that regulations be established to govern car operation under normal circumstances. Rules of the latter class are intended to insure the rendering of high-grade service to the public. Too rigid adherence to such rules, however, may injure the service instead of promoting it.

When a request is received from some outside source to have a slight modification made in operating practice to accommodate a particular group of people, how often it happens that the management replies that such a thing cannot be done because it would be contrary to rules. By taking this attitude the railway loses friends and creates the impression that its service is incapable of meeting the needs of a particular situation.

An instance of this sort of thing is the failure of many street railway companies to arrange connections between their cars and steam railroad trains. For a car to leave the local railroad station exactly on schedule time, when a minute delay would accommodate a considerable number of people alighting from a train, is the worst kind of salesmanship. Some railways, on the other hand, pay particular attention to this matter and try always to have cars available for passengers arriving and departing by the steam railroads. In general, the direct financial return more than offsets whatever

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cost may be involved and the increase in public good will is an additional advantage.

Electric railways must, of course, be operated according to time tables. Generally speaking, the closer the adherence to schedule the better the service. But a schedule or any other operating regulation is a means to an end, not an end in itself. When these regulations assume a greater importance in the eyes of the management than does the convenience of the public, the railway is headed toward trouble.

Small Cities, Too, Have Acute Traffic Problems

UNDER the changed conditions of recent years traffic congestion in communities of medium size has become a problem no less trying to the railways than it is to companies that operate in large cities. This was made plain in a recent commission investigation in a city of 130,000. The commission found little cause for complaint about the physical equipment of the local railway, but it did find a basis for complaint about irregularity of service. It agreed with the company that service is necessarily affected by the width of the streets, by interruptions caused by railroad and canal intersections and the character of the police regulations, all matters over which the railway management has no control. On the other hand, the commission did make certain constructive suggestions pertinent in the case under review, and all of them equally pertinent in the case of other companies similarly situated. One of them was for a larger supervisory force, properly trained and with clearly defined duties.

In particular the commission pointed out that inspectors should be clothed with authority sufficient to correct interruptions to headways and to prevent undue layovers at terminals. Furthermore, it suggested that the duties of these inspectors at heavy loading points should be broadened to include the making of change for passengers pending the arrival of the cars. Moreover, it was suggested that at these heavy loading points the rear doors of the one-man cars be opened to permit passengers to enter upon payment of fare to the inspector or to some other person vested with authority to collect fares. But that was not all. Fully cognizant of the trying conditions imposed upon the company from outside sources, the commission recommended to the City Commission further regulation of traffic by the elimination of parking on streets which it designated and the diversion of traffic from streets on which trolleys are operated in so far as practicable.

The significance of the survey of the commission lies in the constructive suggestions made both to the railway and to the city. It is not easy always to say what is best to be done in a particular case. The conduct of many companies in communities of moderate size has been arranged on a plan that contemplates doing the very things the commission pointed out as advisable in the case under review. To them, of course, the commission's suggestions do not apply. However, even in the incomplete form in which the matter has here been set down the commission's suggestions do carry a valuable lesson to other companies. After all, physical equipment, however well maintained, and men, however well trained, are inadequate of themselves fully to cope with any problem unless directed intelligently under a measure of individual responsibility intended to bring out on the part of each man involved the fullest measure of service of which he is capable.

Preparations for Exceptional Crowds

BOTH electric and steam railways must on occasion handle exceptionally large passenger traffic to or from some event, usually an athletic contest or some kind of agricultural fair. On properties which have such events frequently, as in cities where the major baseball leagues play, the problem has become somewhat simplified because semi-permanent provision can be made to care for these large assemblages. In the college town where the great football game or baseball game is held, and in the county seat where the county fair occurs, on only one or, at most, a few days during the year, the problem is more complicated. The athletic field or fair ground is usually on the outskirts of the city and is served by only one route, so track capacity is limited. Rolling stock, feeder capacity and power, when designed for the average peak load of the year, also are limited, as is also the number of employees competent to operate equipment.

The similar problem of the steam line was considered at a recent meeting of the Institute of Transport held in London, England. At that meeting various "axioms" were laid down. A number of them are so pertinent to similar conditions on electric lines here that, somewhat paraphrased, they will be repeated:

Careful selection of a well-trained and experienced staff to handle the special traffic, preference being given to men who have done this work before and thus have become familiar with the requirements.

The necessity for clear and concise instructions to the staff concerned as to the arrangements for the movement of this traffic so that misunderstanding and error may be avoided.

Early and general advertisement of the special facilities, with clear directions to passengers, and adequate signs on the day of the event, so that confusion may be avoided.

Keeping interference with ordinary traffic facilities to a minimum. Regular travelers generally take the view that it is unjust to inconvenience them for the sake of the pleasure seeker, even though most of these regular travelers become pleasure seekers sooner or later.

Careful study of the various problems, so that the best use may be made of available facilities without having to incur the expense of providing costly plants for infrequent use.

Study of the traffic measures taken and the results obtained as soon as possible after the event, in order to apply the experience gained on future occasions.

Close observation by responsible officers of the actual operation of traffic at strategic points, so that immediate action may be taken in the event of emergency.

The closest possible co-operation between the railway and the organizers of events which produce large crowds, with a view to the removal of the usual difficulties.

As a rule these extra heavy days are not particularly profitable, because of the added expense of one kind and another which is involved. Nevertheless, the prestige of the company in the local community is greatly enhanced when such service is given on occasions of this kind. Knowledge of this, with the satisfaction which always comes from work well done in connection with an important local event, will insure cordial co-operation on the part of the entire staff participating. The problem then is really one primarily for the management. If the rules already mentioned had to be summarized in a few words, they would probably be to know what to expect, then make ample preparations for it. This, in fact, is the secret of success in any large undertaking.

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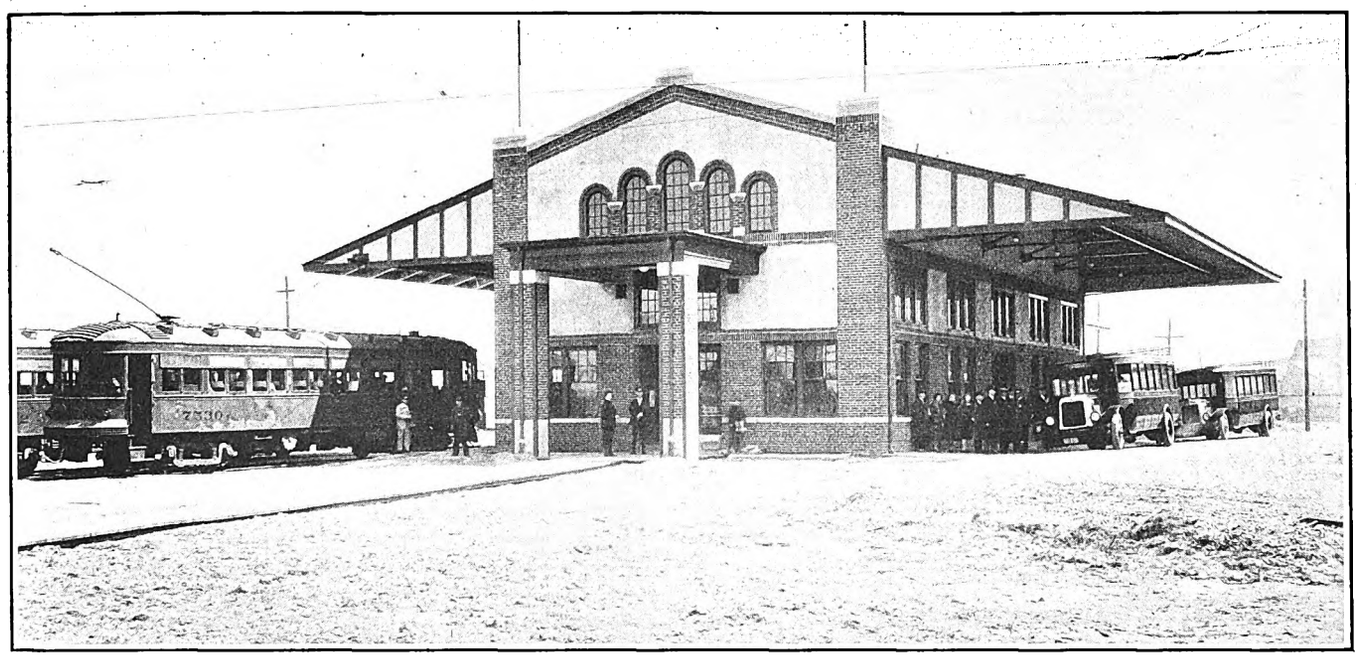


The Combined Bus and Interurban Stations Are Built of Cinder Concrete Block Trimmed in Brick and Stone. Wide Canopies Extend Over the Car and Bus Loading Platforms on Each Side, and the Roof Is Carried Back Approximately 120 Ft. from the Rear of the Building to Cover a Large Open Platform

Interurban Passengers Transfer to Buses at Outlying Terminals

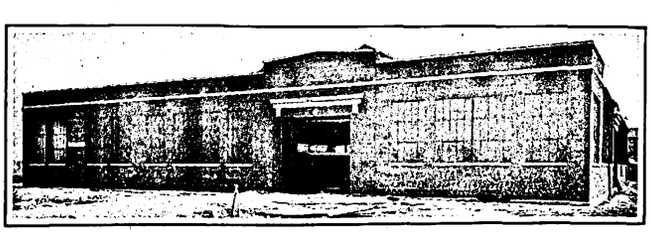
The Detroit United Railway Has Begun the Use of Buses to Transport Its Interurban Passengers Between the Downtown Waiting Room and Suburban Terminals—Interurban Cars Which Were Formerly Tied Up in Slow-Moving City Traffic Are Released for Added Service Outside the City

ELECTRIC interurban cars for the long haul, buses for the congested city run—that is an innovation just started on a large scale by the Detroit United Railway. A new terminal project has been carried out, so that facilities are provided for the comfort and convenience of the company's patrons.

Buses are used to haul interurban passengers between newly constructed outlying terminals and the present downtown interurban waiting room. The passengers transferred between the interurban cars and the new buses are transported an average distance of 5 miles to the present downtown interurban station. A saving in time of between ten and twenty minutes is made from the time required for the interurban cars to come in over the city tracks of the Detroit Department of Street Railways. To give an approximate idea of the magnitude of this undertaking, approximately 10,000,000 passengers per year are transported into and out of the city over the various divisions of the interurban property.

As in most cities where interurban cars reach the business districts over street railway tracks, slow operation due to interference of city cars and other vehicular traffic has presented a serious operating handicap and has been a source of considerable annoyance to passengers. For some time past the D. U. R. has considered the possibility of linking up its interurban service with the various rapid transit schemes proposed for Detroit. The present plan of utilizing buses to carry interurban passengers into the city is the outgrowth of this study. It was found that the slowness of the interurban schedule within the city caused many passengers to leave the interurban cars at the city limits and complete the journey to the downtown section by jitneys.

The new bus service not only cuts down materially the time taken in reaching the center of the city, but it also results in a number of other operating advantages and economies, including shortened car schedules and reduction of interruptions and delays from city traffic interferences. Interurban cars, operating over the street railway tracks, make an average speed of approximately 9 m.p.h. The average speed outside the city on the main divisions of the interurban system is approximately 36 m.p.h. During the maximum load period there were about 65 interurban cars from the various divisions tied up in this slow-moving traffic



A Garage at Each Terminal Location Is Equipped with Shop Facilities and Underground Storage for Gasoline and Oil

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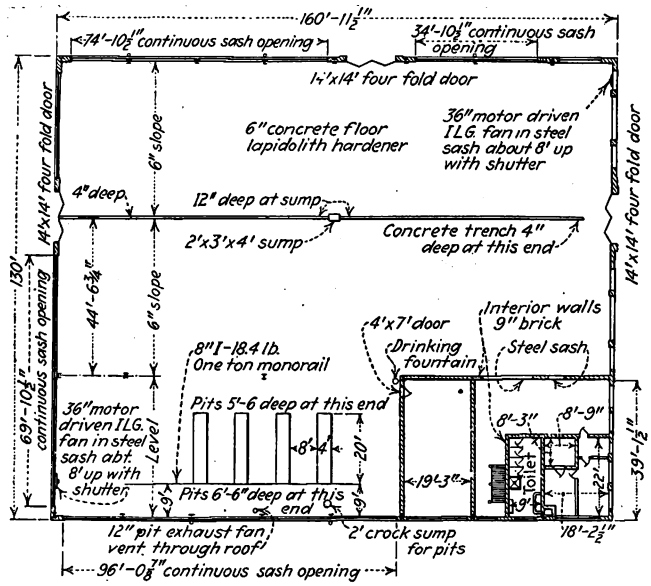


Floor Plan of the Garages, Showing Arrangement for Draining and Ventilating. The Shop and Storeroom Are Located at One Corner of the Building

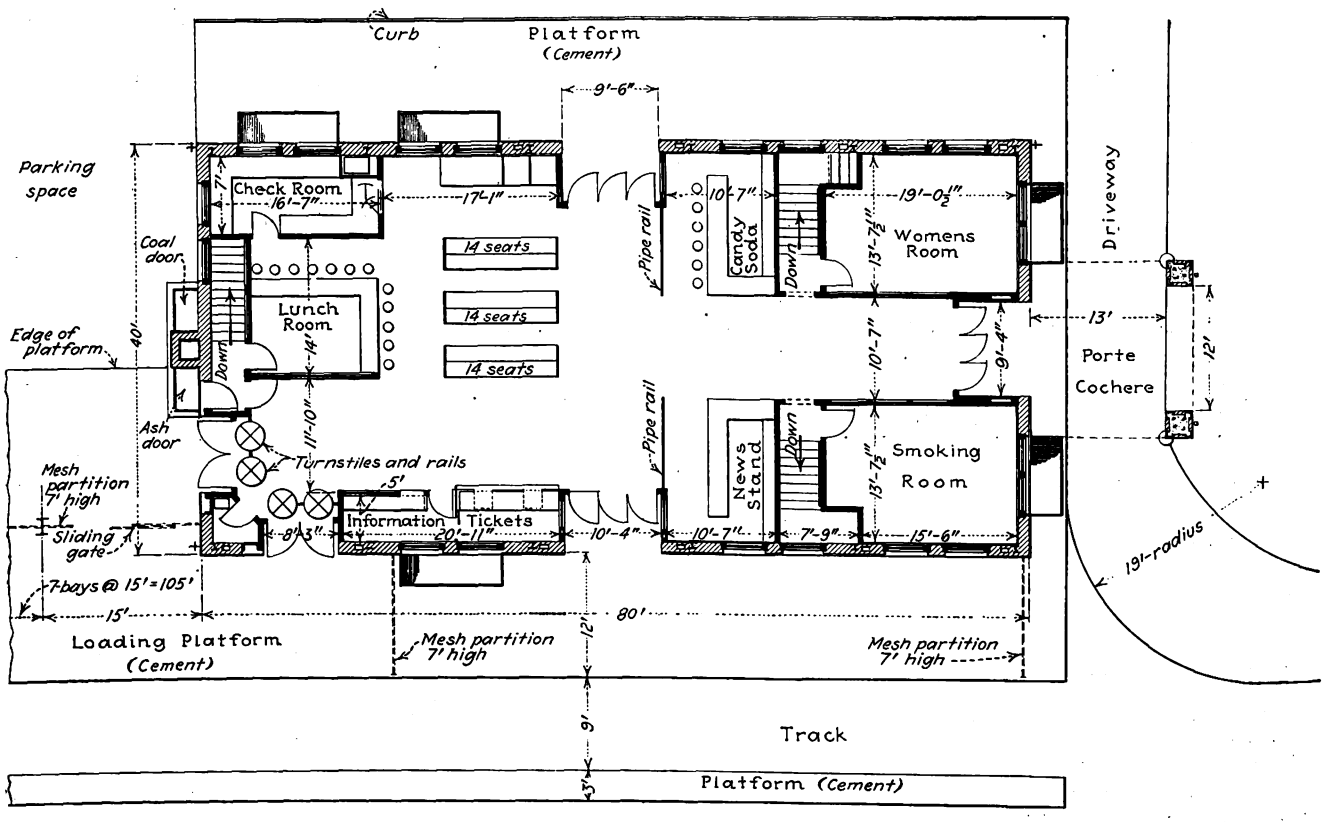
inside the city limits. By substituting buses inside the city approximately 50 of these cars ultimately will become available for additional interurban service. Operating at 36 m.p.h., they then will be approximately four times as useful as when moving at 9 m.p.h. inside the city. In addition to the improvement in service and the economies resulting from this better utilization of existing car equipment, a large part of the $500,000 per year now paid to the city of Detroit as rental for operation of its interurban cars over the city tracks will also be saved. It is expected that the entire cost of bus operation will be absorbed by these economies and that the combined system will show a substantial surplus.

Three new interurban-bus terminals are rapidly nearing completion, and two of them have been put in service. Each terminal, in addition to the station building, includes storage tracks and inspection pits for interurban cars, together with a complete garage and machine shop for storage, inspection and repair of buses. Underground tanks for gasoline and lubricating oil together with a small inspection and wash building for interurban cars complete the layout at each terminal.

Three Stations Placed Outside Congested Area

These stations are located inside the city limits at points on the interurban routes, which are as close as possible to the downtown business area and are still outside of the area of heavy traffic congestion. Track connections to the various divisions are made either on interurban private right-of-way or on streets carrying what is known as class D tracks on which the D. U. R. has operating rights without payment of trackage charges to the city. This arrangement is the result of the surrender by the D. U. R. of unexpired franchise rights on outlying sections of track on certain streets at the time the street railway property was sold to the city. In return for the surrender of these unexpired outlying franchises, the D. U. R. was given operating rights over this track free of trackage charges.

One station is located near Gratiot Avenue and the Detroit Terminal Railroad in the northeastern section of the city, approximately 5½ miles from the downtown interurban waiting room. This station is on the Rapid Railway division of the D. U. R., which extends northeast from Detroit through Mount Clemens and Marine City to Port Huron. A second and similar station is in process of construction on Woodward Avenue opposite the Highland Park plant of the Ford Motor Company. This location is approximately 6 miles from the present downtown terminal and serves the Pontiac and



The Station Buildings Were Laid Out to Facilitate the Quick and Convenient Interchange of Passengers Between Cars and Buses

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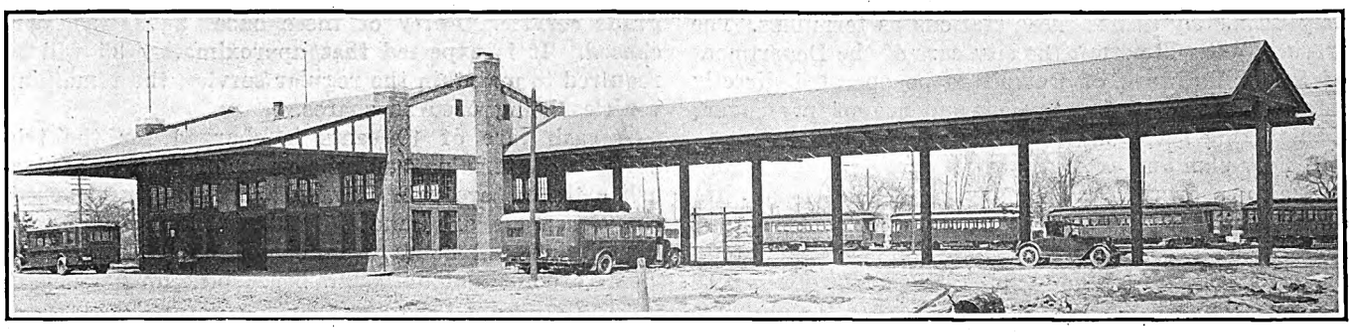


Pleasing Architectural Treatment of the Station Buildings Gives the Impression of High-Grade Service. Passengers Pass Directly Through the Building When Transferring Between Cars and Buses

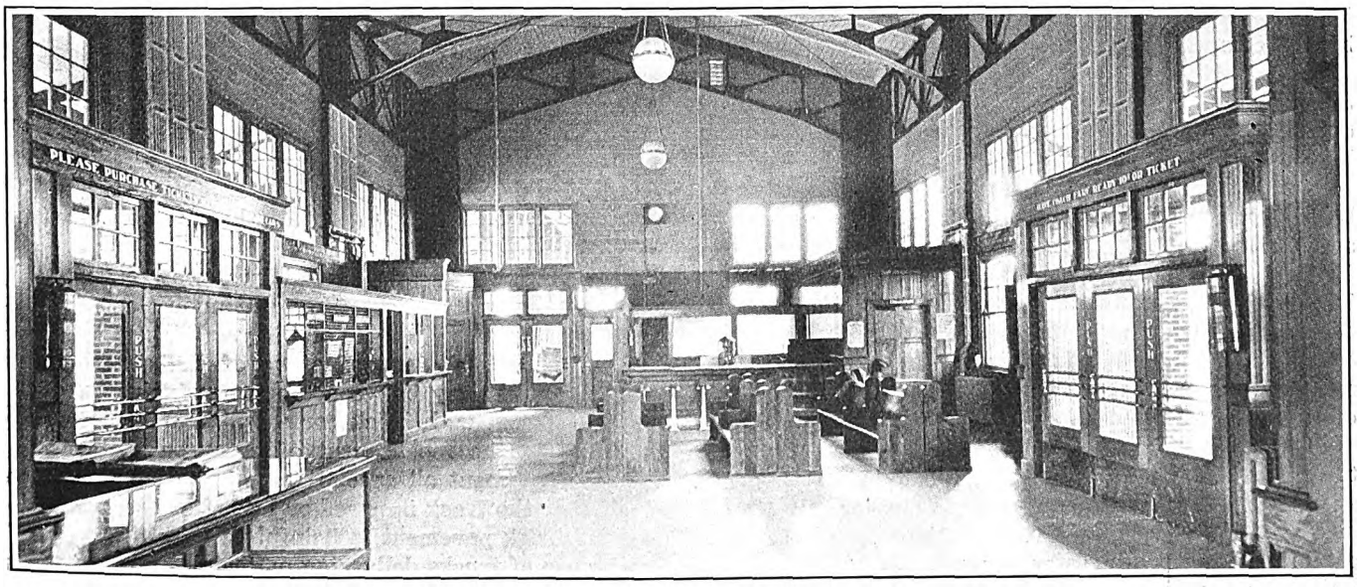
Flint divisions of the interurban. Still another is located on Fort Boulevard, approximately ¾ mile south of the blast furnaces at the Ford River Rouge plant. This station is about 6 miles from the downtown terminal and is on the D., M. & T. S. L. Railway division, leading south from Detroit to Toledo. At each of these locations similar facilities are provided.

The Gratiot terminal is typical of the others and is shown in the accompanying illustrations. It is located on a 21½-acre tract. In addition to the building, it includes a garage 130 ft. x 160 ft., capable of housing 50 buses, together with a service shop, office and stock room. Underground gasoline storage tanks with a total capacity of 80,000 gal. and additional tanks to hold 12,000 gal. of lubricating oil have been installed. Switch tracks and storage tracks for interurban cars, open inspection pits and a 30-ft. x 100-ft. galvanized-iron inspection and wash building are provided. Space is also available for a future freight terminal on this property, whose convenient location relative to the Detroit Terminal Railroad makes it advantageous for developing freight facilities at this point.

It was considered advisable to erect high-grade station buildings of pleasing architecture and permanent construction in keeping with the high-grade service they render. Particular care was taken in working out the plan to avoid makeshift facilities. The station building is constructed of cinder concrete block. trimmed in pressed brick and stone. It is finished on the outside in stucco and is painted in the interior. The roof is carried on structural steel girders which extend out over the walls to form wide canopies over the interurban loading platform on one side of the building and the bus loading platform on the other side. At the front, a porte-cochère extends over a driveway conveniently connected to the street for the use of private vehicles, taxicabs, etc. The roof is carried back approximately 120 ft. from the rear end of the building to cover a large open platform. This construction is arranged so that the building can be enlarged in the future without disturbing the roof. Provision is also made to allow the construction of glazed side walls at the eaves of the canopies if this ever becomes desirable.

The interior of each station is arranged to allow the convenient interchange of passengers between cars and buses. In addition complete waiting room accommodations are included for passengers starting or terminating their journey at this point. Wide doors on each side of the building allow direct communication between the interurban and the bus platform so that passengers may move directly and quickly through the building from one vehicle to the other. Wire mesh partitions and gates are arranged to control the movement of passengers. In the interior of the station a women's rest room and men's smoking room are located in opposite front corners. Wide stairways lead from each of these rooms to wash rooms and toilets below. Space for various concessions, such as cigar and news stand, lunch room, check room, shoe-shining stand, public telephones, candy and soda counter, is provided, and station type benches are installed for waiting passengers.

It is expected that independent bus lines as well as the intercity buses recently acquired by the D. U. R. and operated independently of the interurban service



Complete Accommodations for the Convenience of Passengers Are Provided in the New Stations

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may ultimately utilize these stations as terminals. The track layout will permit the city cars of the Department of Street Railways of Detroit to be operated directly into the property for the convenience of passengers transferring between street cars and interurbans.

A floor plan and exterior view of the garage building are also shown in accompanying illustrations. Its dimensions are 130 ft. x 160 ft. Ample drainage facilities make it convenient to wash buses, and four inspection pits 4 ft. wide by 20 ft. long facilitate inspection and maintenance. Wide glass areas in the building walls insure ample natural illumination, and 36-in. motor-driven exhaust fans installed at diagonally opposite corners of the building are designed to keep the interior free of gas fumes. At one corner are located the office, store rooms and shop space, together with toilet and wash rooms. Donaldson & Meier of Detroit acted as architects for the station building, and the Austin Company, general engineer and builder, designed the garages and is doing the general construction work at the three terminals.

Room is available at each terminal to store private automobiles which may be driven to the terminal from their owners' homes in the city. This is expected to encourage automobile owners to use the interurban, instead of driving their private cars considerable distances out of Detroit because of the convenience which these cars afford in getting about within the city area.

Besides the saving in time afforded by the use of buses between the new outlying terminals and the center of the city, the flexibility of the buses is expected by the company to permit other innovations in operation that will add to the convenience of the service. Since several buses will be required to handle the load on each interurban train, it is expected that these will be operated on various routes to and from the business section and the outlying stations. One or more of these buses will probably be operated on the most direct route, so as to make the trip in as short a time as possible. By having the remaining units take various other routes in reaching the downtown station, passengers may be enabled to reach their ultimate destinations in the most convenient manner. In addition, if it seems advisable, one may call at the important hotels for the convenience of traveling men and others using the interurban.

Single-deck coaches of the "Z" type, manufactured by the Yellow Coach Manufacturing Company of Chicago, are used in this terminal service. A special long wheelbase of 228 in. permits a seating capacity of 29. The seats are leather upholstered, and the entire interior finish has been designed to carry out the idea of high-grade service. Forty of these buses have been purchased. It is expected that approximately 35 will be required to maintain the regular service, the remaining vehicles being used as spares.

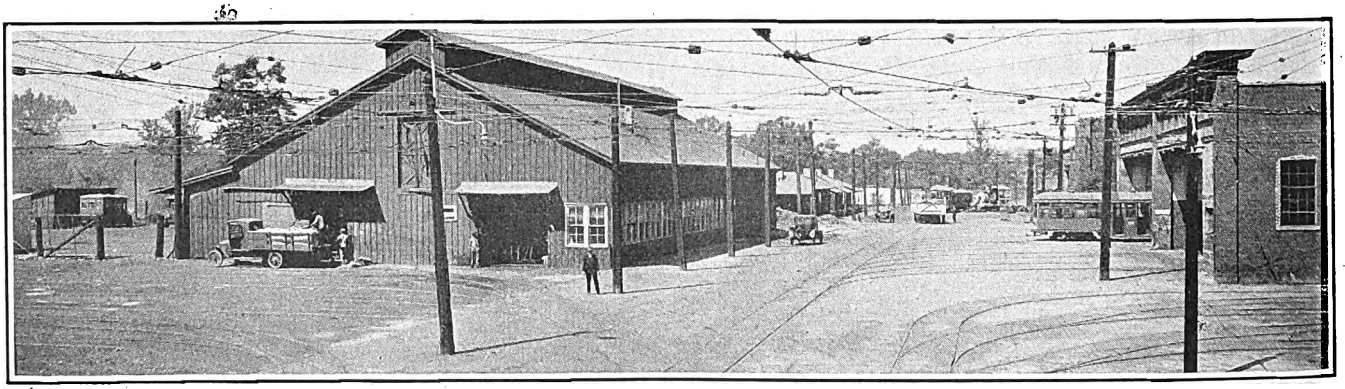
A cash fare of 10 cents is charged for the trip between the terminals and the center of the city. Interurban tickets are printed with a bus coupon attached. No passengers are handled locally within the city, although inbound buses drop passengers at any intermediate point and outbound buses pick up passengers for the outlying terminals.

All phases of the terminal bus operation are handled by the People's Motor Coach Company, a separate subsidiary organization which operates interurban buses to various points in the state and also handles the local service in Flint, Ann Arbor and Port Huron.

Drivers for the Detroit terminal service have been transfered from train service on the D. U. R. These men wear distinctive bus uniforms and are specially trained for their new work.

Yard Tracks Built for Hard Service

DURING the past year the Birmingham Electric Company rebuilt the special work at its main carhouse and repair shop. Two new storage yards were added alongside the existing buildings. At the same time the carhouse at the eastern end of the city was abandoned and arrangements were made to operate all cars from a single station. This was particularly advantageous on account of the central location of the main shop and carhouse.



All Special Work at the Entrance to the Main Carhouse of the Birmingham Electric Company Has Been Renewed, Using 7-In. 140-Lb. Guard Rail

In renewing the special work and constructing the two storage yards 7-in. 140-lb. A. E. R. E. A. guard rail was used throughout. Solid manganese switches with hard center frogs and mates were installed. In place of the ordinary bolted compromise joint between the special work and the straight rail, thermit welded joints were used.

The general layout is divided into two sections with all tracks in each section being continuous loops. This was done to make all parts of the yard as accessible as possible. An interesting feature of the arrangement is that the roadway between the two principal sections has been paved with brick for a width of about 80 ft. To facilitate the replacement of a car on the rails in case of derailment all special work is paved regardless of whether the track is paved or not. Moreover, in this case the brick pavement is helpful to the railway itself for the use of trucks delivering material, buses entering the company's garage, etc.

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Rapid Transit Cars in Berlin

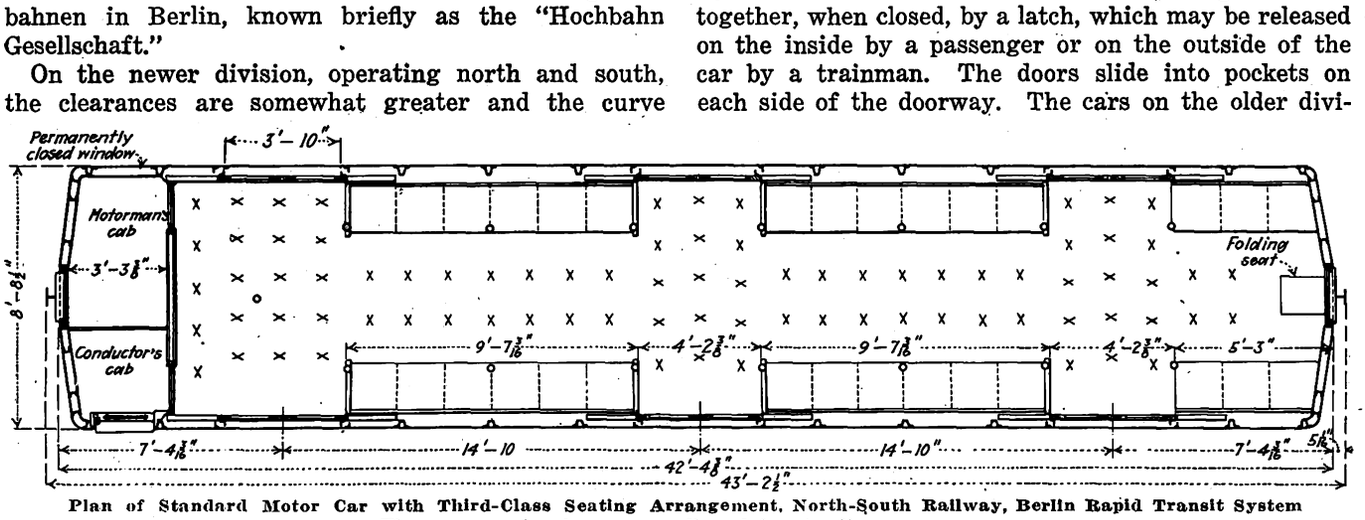
Semi-Steel Cars for Elevated and Subway Service Have Monitor Roofs, Hand-Operated Double Sliding Doors and Linoleum-Covered Floors—Tunnels of Different Size Require Two Sizes of Cars

THE standard type of car on the Berlin elevated and underground system is shown in the accompanying illustrations. This Berlin rapid transit system consists of two divisions—the original line, roughly in the form of a Y, operating in a general easterly and westerly direction across the city, and a north and south division, recently opened. Both are owned by the Gesellschaft für elektrische Hoch-und Untergrundbahnen in Berlin, known briefly as the "Hochbahn Gesellschaft."

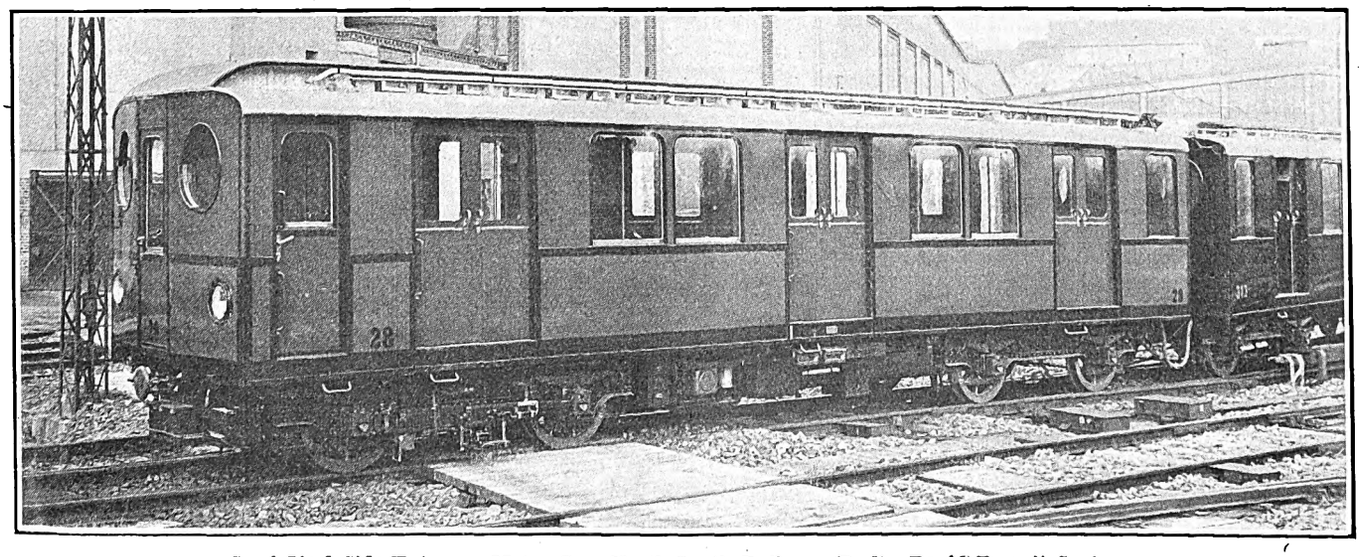
On the newer division, operating north and south, the clearances are somewhat greater and the curve radii longer. Hence somewhat longer and wider cars are used on this division. Otherwise, the appearance and construction features of the cars are alike. The main dimensions of the cars on the two divisions follow:

The cars are of semi-steel construction. The underframing and side framing are of steel, and steel side panels are used. The roof, seats and inside trim are of wood, the roof being covered with canvas. The floor is made up by a layer of asbestos on sheet steel and an upper flooring of pine, tongued and grooved, then covered with one layer of linoleum. The windows have single sash and are arranged to be lowered about 10 in. The end windows are oval shaped and also can be lowered about the same distance. Ventilation is obtained by means of these drop sash and by the deck sash in the monitor roof.

The third-class cars on the North-South Railway, as shown in the illustrations, have three doors on each side, each door opening having a clear width of 4 ft. 2⅜ in. The double doors at each opening are held together, when closed, by a latch, which may be released on the inside by a passenger or on the outside of the car by a trainman. The doors slide into pockets on each side of the doorway. The cars on the older division, which are somewhat shorter, as described, have two side doors instead of three.



Plan of Standard Motor Car with Third-Class Seating Arrangement, North-South Railway, Berlin Rapid Transit System
The cross marks show space allowed for standing passengers



Semi-Steel Side-Entrance Motor Car, North-South Railway, Berlin Rapid Transit System

The third-class cars on both divisions are fitted with longitudinal side seats of wooden slats, veneered. In the second-class compartments the seats are upholstered. In the car shown the seats are carried right up to the doorway, but in some recent cars, as described in the issue of Feb. 21, page 310, a space is left between the end of the seat and the door opening. The end door is for emergency use only, and in front of the door, as shown on the plan, is a folding seat. The stanchions and wooden horizontal rods for handholds, characteris-

DIMENSIONS OF CARS ON BERLIN RAPID TRANSIT SYSTEM

	Original System	North-South Railway
Length over buffers	42 ft. 1 in.	43 ft. 2⅜ in.
Height of empty car from top of rail to top of roof	10 ft. 5½ in.	10 ft. 5¼ in.
Width outside of side panels	7 ft. 5 in.	8 ft. 8½ in.
Distance between truck centers	24 ft. 10 in.	26 ft. 2⅜ in.
Wheelbase of truck on motor car	5 ft. 10¾ in.	7 ft. 3½ in.
Wheelbase of truck on trail car	.....	6 ft. 6 in.

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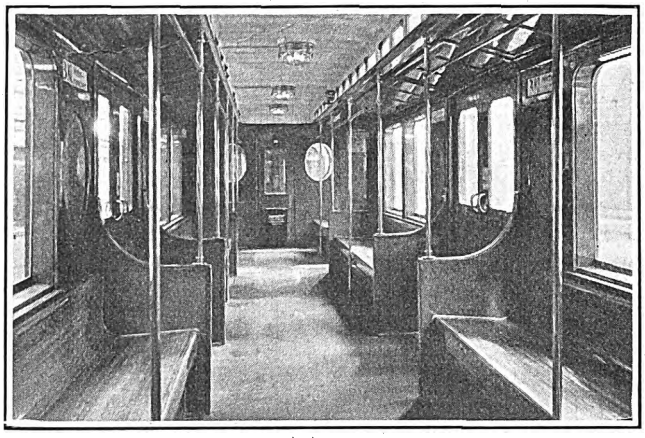


Interior of Third-Class Car, North-South Railway, Berlin, Showing Seating Arrangement, Stanchions, Etc.

tic of the cars on the Berlin Elevated Railway, are conspicuous in the interior view.

The interior finish of the car is highly polished varnished natural oak. The upper deck ceiling contains no headlining; the carline and roof boards are painted white. The deck sash and framing are also painted white. Below the deck sill, however, a natural oak finish is used. The lower deck ceiling is paneled in oak, matching up with the inside trim and side panels. No advertising signs are carried in the interior of the car.

Six lighting fixtures are mounted on the upper deck ceiling. These are equi-spaced down the center of the car. Each fixture consists of three lamps covered with a clear glass bowl. The wiring for these lights is carried in conduit along the outside of the car just above the deck sash, as shown in the exterior view. A small conduit placed alongside of a carline connects the main conduit with each lighting fixture.

The plan shown is that of a motor car and has at one end a cab for the motorman on the right and one for the conductor of the train on the left, or the platform side, of the car. There is a door for entrance to each cab from the exterior as well as from the interior of the car, and there is a window between the two cabs so that the conductor can watch the motorman. The motor car shown has a seating capacity of 31 third-class passengers. With the end cabs removed, as on a trail car, the seating capacity would be 38. The space for standing passengers in the motor car is estimated to be adequate for 82 passengers and in the trail car for 81 passengers. On both divisions the company operates two classes, second and third, but no first class. It also has smoking and non-smoking compartments.

Nickel steel axles are used with steel-tired wheels. Current is obtained from an under-running third rail shoe. Each motor truck carries two 85-kw. motors operating on 750 volts, d.c. The maximum speed is about 31 m.p.h. The cars are fitted with hand brakes and automatic air brakes. The latter are capable of being set by an automatic trip device in the track, in case a train runs past a signal.

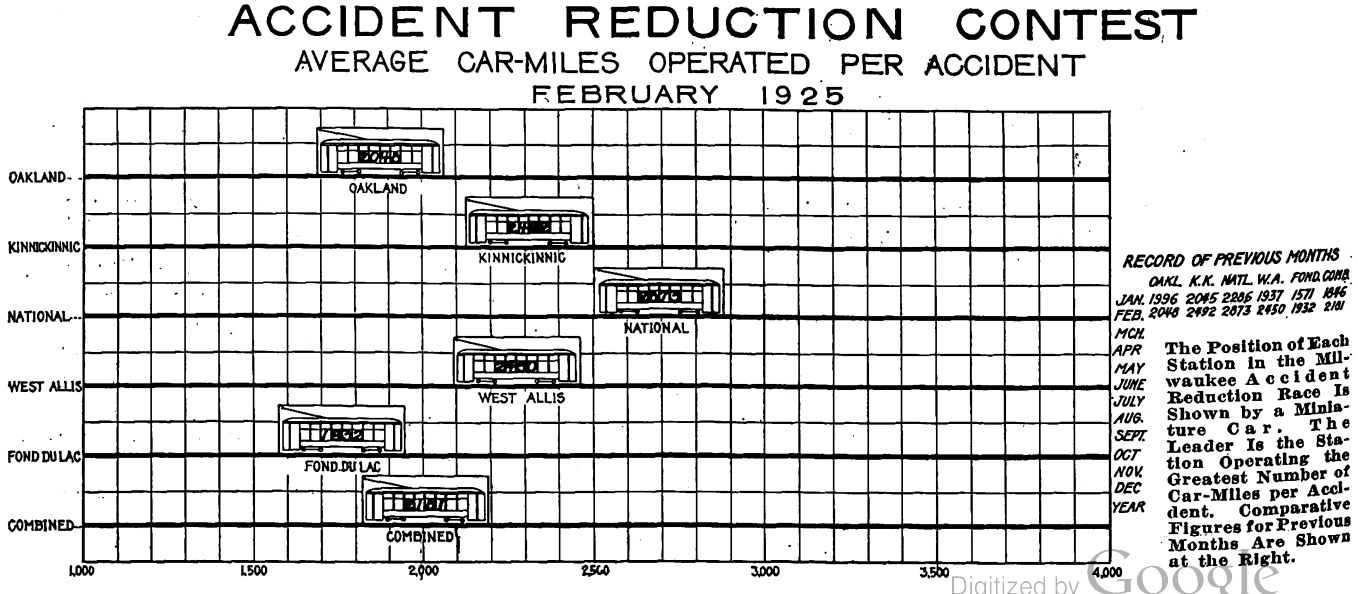
Milwaukee Holds Accident Reduction Race

A NEW form of contest is being conducted by the Milwaukee Electric Railway & Light Company in an effort to reduce accidents on its lines. In this plan each carhouse on the city system is assumed to be in a race, and the position of each of the divisions is shown by miniature cars on a large chart posted in each station.

The position of each car along the line representing its track shows how many miles were operated by that division per accident for the month. The chart illustrated is for the month of February and shows National station in the lead with a total of 2,873 car-miles operated per accident. Kinnickinnic and West Allis are close contenders for second place, while Oakland and Fond du Lac bring up the rear. Both these latter stations are shown to be below the average for the combined system.

At the right is a table containing the records for previous months. The figures for the winning station are shown in heavy marking. For the month of February the average was 2,181 miles per accident as compared with 1,846 for January, a gain of more than 18 per cent.

A cup is awarded each month to the winning station in the race and remains in that station until one of the others gets into the leading position. In addition, ten prizes, consisting of articles of practical utility, such as caps, changers, electrical appliances for the home, etc., are awarded each month to the winning station and are distributed to the men by lot.



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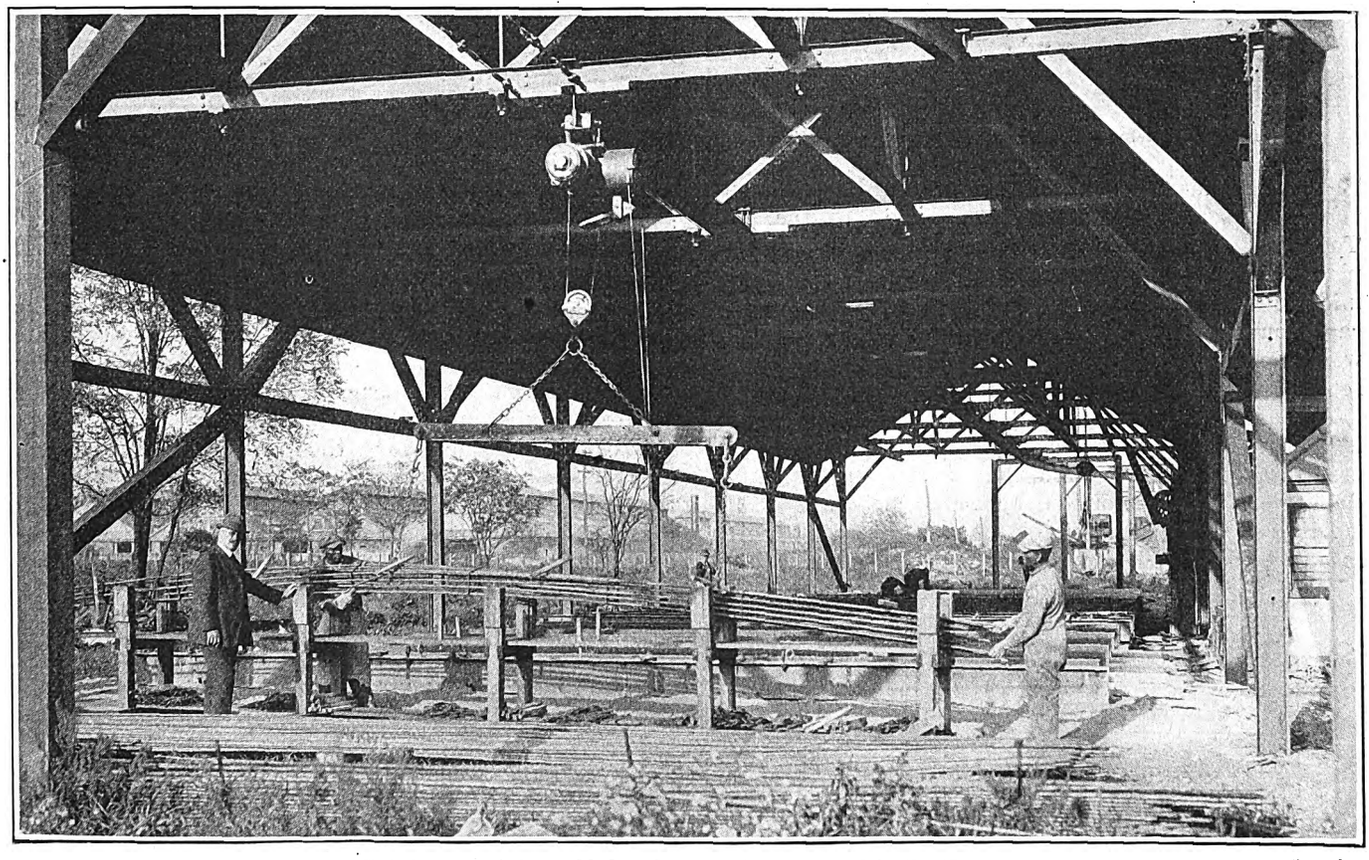
Railway Builds Concrete Trolley Poles in a Modern Plant

United Railways & Electric Company of Baltimore Has Adopted the Reinforced Pole as Standard Construction—Equipment Has Been Installed to Manufacture at the Rate of Ten Poles per Day—Steel Forms Are Used

By W. W. Wysor
Chief Engineer United Railways & Electric Company, Baltimore, Md.



Reinforcement Assembled and Ready to Be Placed in the Form

IN A LIMITED way the United Railways & Electric Company of Baltimore has been using concrete trolley poles for the past twelve years. As they have proved entirely satisfactory it was decided a year or two ago to adopt them as the company's standard construction. Prior to 1924 concrete poles were manufactured by this company from time to time in an open yard, using wood forms. Not more than 100 poles were made in any single lot. While fairly satisfactory poles could be made in this way it was realized by the management that better facilities would be desirable if the poles were to be manufactured in larger numbers. A new plant for this purpose was completed and put in operation in the fall of 1924.

The plant consists of three main parts—a molding shed, a mixer shed and a storage yard. The molding shed is 160 ft. by 30 ft. and protects the workmen as well as the freshly-made poles from the weather. A mixer shed 80 ft. by 12 ft. 6 in. accommodates the mixing apparatus and provides storage room for cement, etc. Completed poles are piled in a storage yard connected with the molding shed by an overhead runway.

Reinforcement for the poles is provided by fourteen ¾-in. round steel rods. Of these four are 29 ft. 8 in. long, four are 23 ft. 6 in., four are 17 ft., and two are 12 ft. The poles themselves are nominally 30 ft. in length, although the actual over-all dimension is 30 ft. 3½ in., including the pointed top. Reinforcing rods are held accurately in place by ten sets of short plates or strips punched with holes to receive the rods. These strips form rectangles of such size that the centers of the rods are 1½ in. from the outer face of the concrete. The rods are assembled in cage form on a special workbench at one end of the molding shed. The appearance of a completed cage is shown at the top of this page.

On account of warping, cracking, etc., the wood forms used in the old process of making concrete poles in Baltimore frequently got badly out of shape and had to be replaced. For this reason steel forms are used in the new plant. There are 30 permanent beds and twenty sets of forms. Each bed is a tapered steel plate permanently secured to a concrete foundation. This shapes one side of the pole. The sides are formed by two steel channel plates clamped securely in position.

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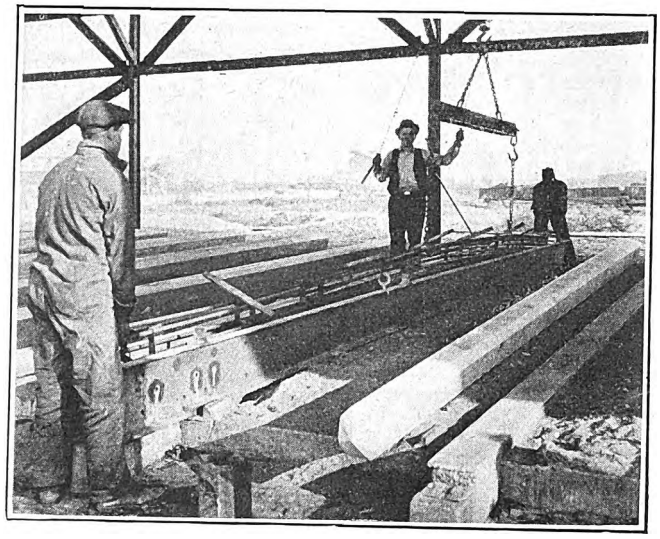
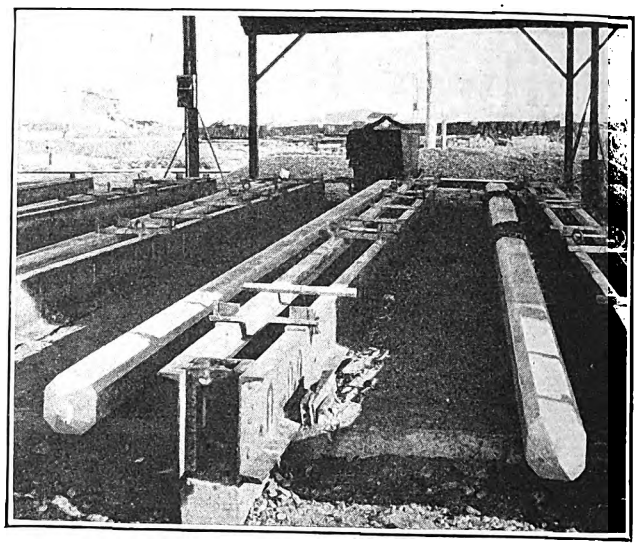


Lowering the Reinforcement into Position in the Form

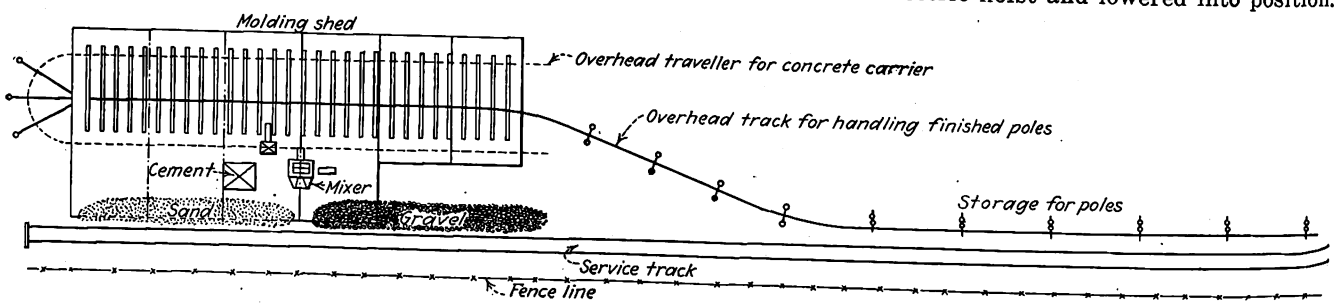


Form Set Up Ready for Concrete to Be Poured

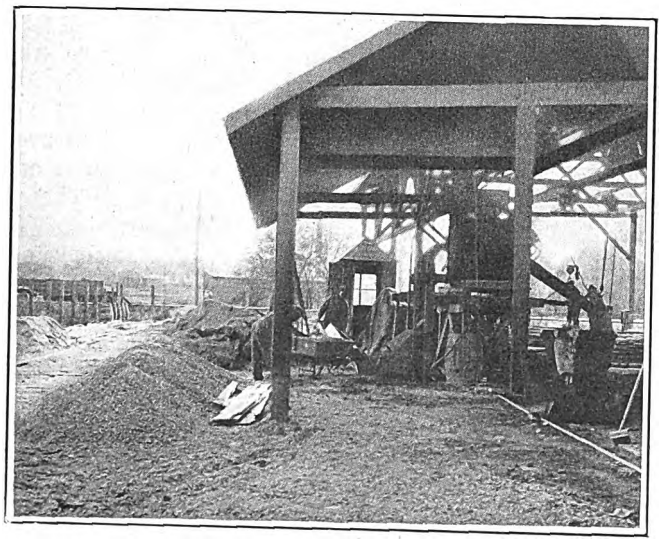
Triangular hardwood strips are fastened to the side forms by screws to chamfer the edges of the pole. Tops and bottoms of the poles are formed by cast-iron plates inserted between the side channels. The pyramidal form of the top of the pole is molded by the cast-iron end piece. Reinforcement is suspended by wire from wood crosspieces. The appearance of a form set up and ready for concrete is shown above.

A concrete mixture of 1-2-3 is used. The aggregate is ⅜-in. to ¾-in. mixed gravel. In the old process concrete was mixed by hand, but in the new plant a Ransome mixer is mounted opposite the center of the molding shed and at a suitable elevation for discharging into a bucket. The mixer is loaded by means of a skip hoist. Sand and gravel are accurately measured in boxes specially constructed for this purpose and mounted on wheelbarrow frames. A concrete bucket which receives the concrete from the mixer is handled on a bucket runway extending the full length of the molding shed on both sides. This is entirely separate from the runway for the electric hoist which handles reinforcing rods, steel forms, completed poles, etc. The concrete mixing apparatus is shown below.

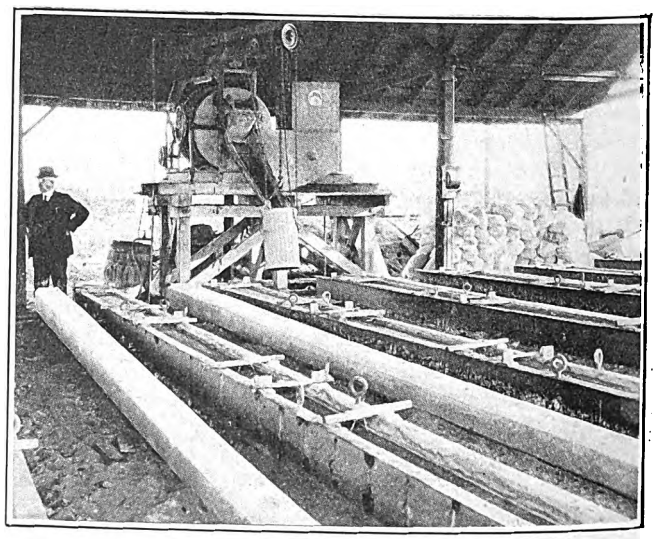
Procedure in casting the poles is as follows: Sets of steel side forms are set up in place. Reinforcing rods which have been assembled at the workbench referred to in a preceding paragraph are brought over by means of an electric hoist and lowered into position.



Layout of Concrete Pole Plant of the United Railways & Electric Company of Baltimore



Concrete Mixer Is Located in a Separate Shed Alongside the Molding Shed



Discharging Side of Concrete Mixer and Bucket Used for Filling Forms

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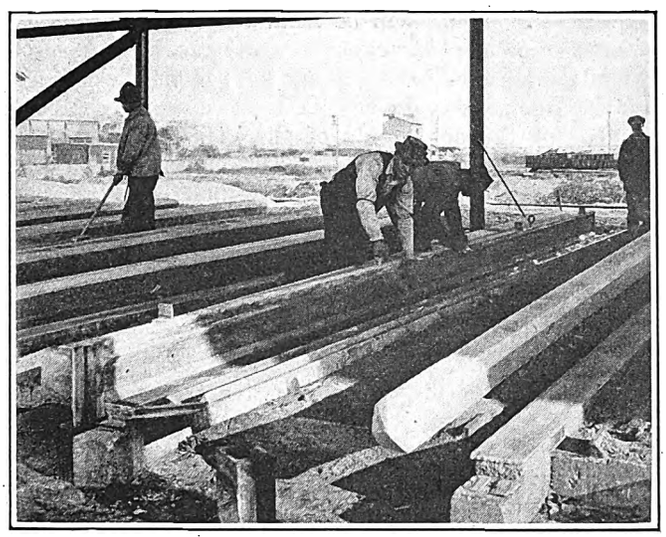
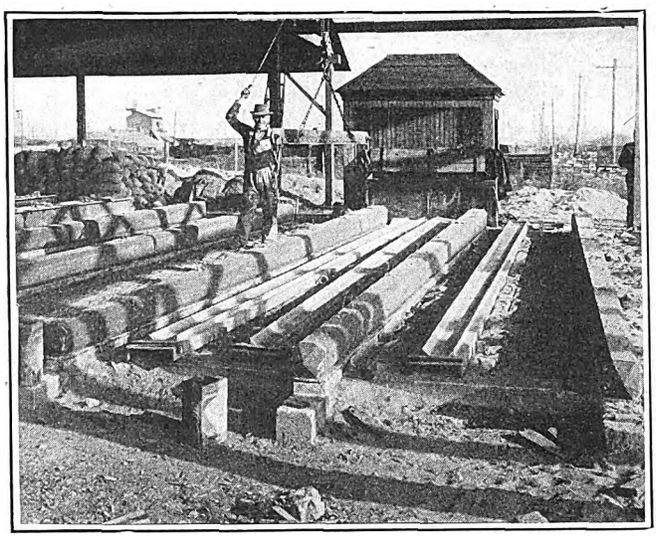


After Three or Four Days Hardening Poles Are Rolled Off the Steel Beds onto Sand Beds Alongside



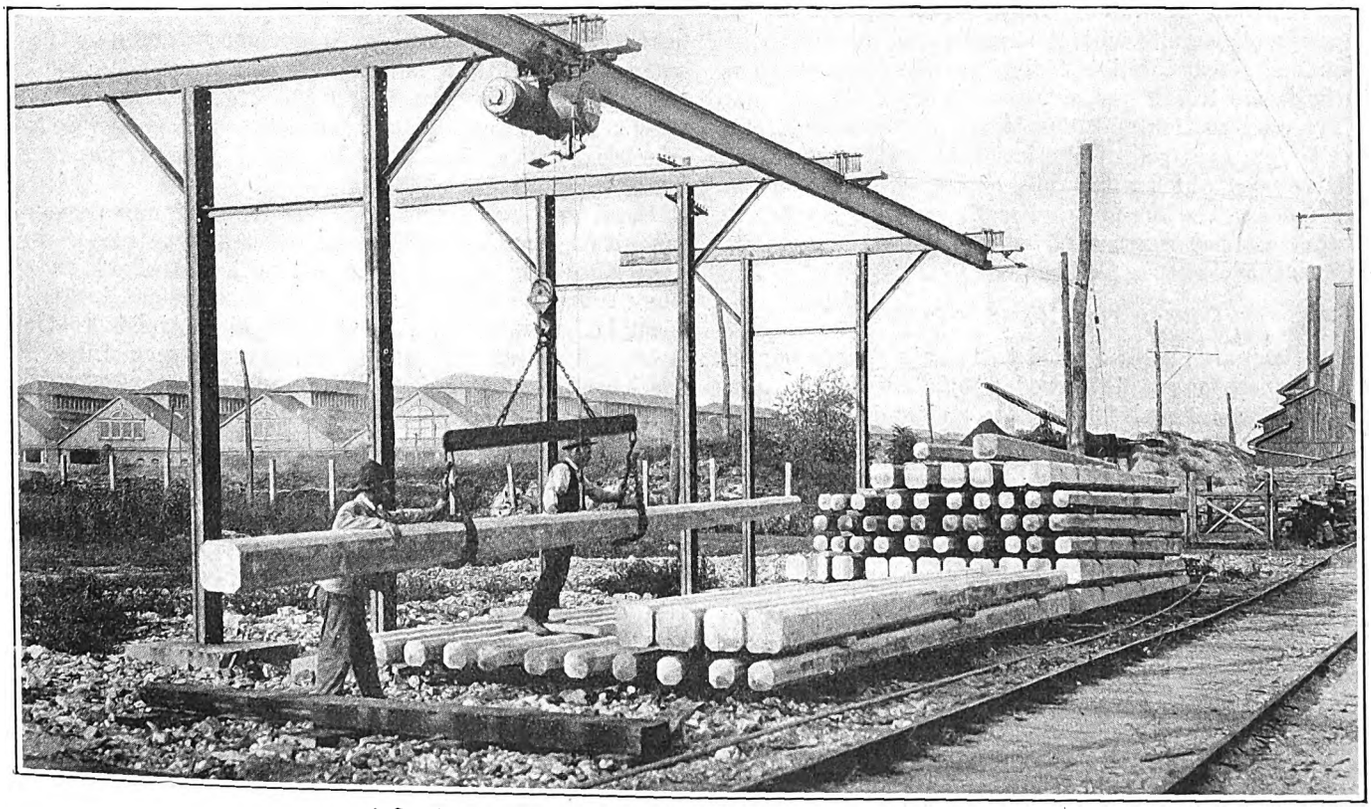
Electric Hoist Ready to Pick Up a Finished Pole and Carry It to the Storage Yard

This process is shown in an illustration on the preceding page. Concrete is then poured into the forms and thoroughly worked into place around the reinforcing rods. Particular care is taken to see that all voids are thoroughly filled. The top surface is troweled off to a smooth finish.

After the poles have hardened for a period of 24 hours the side forms are removed and set in place on the ten other beds. When the hardening process has continued for three or four days the poles are rolled off the steel beds onto sand beds immediately alongside. The method of removing the forms and the sand beds on which the poles rest during the hardening are shown in the illustrations above. This frees the forms for the making of other poles.

After the poles have hardened for a period of ten days or more, depending somewhat on the weather, they are picked up by the electric hoist and carried to the storage yard. This hoist is equipped with a special spreader which spaces the lifting hooks some distance apart and gives greater stability. The runway for the electric hoist goes on out to the end of the storage yard. Alongside this yard is a railway track to accommodate the flat cars used for transporting poles to the locations where they are needed. This track is used also for bringing in cement, sand, gravel, etc., for the mixer. The general arrangement of tracks and sheds and storage yards is shown in an accompanying sketch.

When the plant is in operation ten poles are made at a time. As the forms are removed at the end of 24 hours and used on another set of beds, this gives a capacity of ten poles a day. The force of men required is small and the operations are practically continuous with no waiting for the release of forms.



A Special Spreader Has Been Arranged for Carrying the Poles

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Trackless Trolley Expansion in the Far East

Tramways of Singapore Are Being Replaced with Trolley Buses, Which Are Also Used for Extensions in Shanghai by Same Management

THE whole of the tramway system of Singapore, Malay Peninsula, is to be superseded by electric trolley buses. This will form the largest installation of this form of traction yet in existence, according to an article in the *Tramway and Railway World*. The tramway routes are 15¾ miles long. It is proposed to extend the trackless cars over 3¼ miles of additional route, giving a total of 19 miles. As the tramway tracks were in very poor condition, it was deemed advisable to adopt the trackless trolley rather than go to the expense of renewing the track.

Early in 1922 the Singapore Electric Tramways, Ltd., was in financial difficulties and only about 10 per cent of the tramcars were available for service. A receiver was appointed and arrangements were made with the Shanghai Electric Construction Company, Ltd., to finance, rehabilitate and reorganize the undertaking. This task was carried out with great rapidity and efficiency. A complete change of policy was made, fares were drastically cut and the service and speed increased. From losing at the rate of about £50,000 per year the company soon showed a gain.

The ordinance authorizing the adoption of trackless trolleys in Singapore provides that within a year the Shanghai company shall transfer the undertaking to a new company to be called the Singapore Traction Company, Ltd. The company is to pay half the cost of reconstruction of roads and may operate trolley buses, with or without one trailer to each, on 32 different routes and on any other route in Singapore after the approval in writing of the authority within whose district the route is located. Motor buses may also be run on any trolley route with the approval of the authority; also freight cars, either trolley or motor and with or without one trailer.

The construction and dimensions of the cars are subject to the approval of the local authority, but no car may be used which when fully loaded exceeds 8 tons on two axles. The accompanying illustration shows one of the new passenger cars, which is divided into first and second class compartments.

Competition Not Restricted

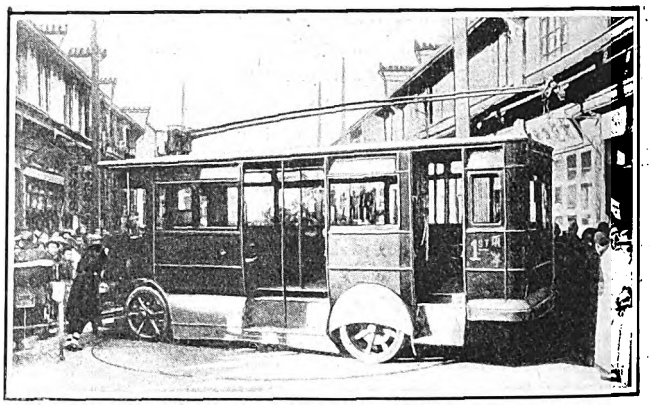
The commissioners agreed to refrain from competitive services on roads served adequately by the company. They refused, however, to undertake to restrain other competitors by restricting licenses, but as the committee thought it would be unfair to subject the company to competition from buses bearing lighter taxes it was agreed that if the total sum payable to the commissioners by any company or person operating competitive public vehicles was less than the taxes paid by the company, the taxation would be increased for such competitors.

The Singapore Traction Company has a capital stock of £400,000, divided into 200,000 preferred and 200,000 common shares at £1 each. The receiver of the old company is to be allotted 200,000 preferred and 167,000 common shares, to be appropriated in various amounts to shareholders and creditors of the old company.

The new company will be managed by the Shanghai company under a management agreement. The cost of management is to be borne by the new company, and the Shanghai company is to receive 50 per cent per year of the net profits of the new company after providing for depreciation, interest, sinking fund and any reserves approved by the Shanghai company, but before charging any British taxation.

Shanghai System a Good Earner

The tramway system in Shanghai is also operated by the Shanghai Electric Construction Company, Ltd., which operates the Singapore system. It is said to be proportionally the most remunerative tramway system in the world. When the tramway was opened to traffic in 1908 the total population of the foreign settlement was about 490,000. It is now about 835,000, which is an increase of 70 per cent as against an increase of only 7 per cent in the length of tramway route. Passengers carried have increased from 11,750,000 in 1909 to about 140,000,000 in 1924. The rolling stock consists of 90 motor cars, 90 trailers and fourteen track-



Trolley Buses in Shanghai Have to Be Reversed on a Turn Table on Account of the Narrowness of the Street

less trolley buses. Each car runs about 30,000 miles per year. The profit has increased from $47,736 (Mexican) in 1909 to more than $1,100,000 (Mexican) in 1924, despite the increase in the depreciation of copper coinage from under 15 per cent in 1909 to over 47 per cent in 1924.

Upon approval from the Council the company may substitute trackless trolleys on any tramway route. In 1915 the company introduced trackless trolleys on a busy route 0.7 mile long. Further extensions in 1924 brought the total length of the trackless trolley routes up to 2.2 miles. Owing to the narrow streets the rail system could not be extended to any great extent, and it is thought that the trackless trolley system is the form of traction most suitable for Shanghai under the conditions prevailing there.

An agreement was entered into last year with the Municipal Council for 18.28 miles of trackless trolley extensions and 4.26 miles additional tramway construction. The company has also planned a system of electric ferries to carry trackless trolley passenger buses and freight cars across the river.

The Municipal Council recently granted licenses to an outside company to run gasoline buses. Some of these are expected to compete with the tramways and trolley buses, and it is said that they have been granted more favorable terms by the municipality than have been allowed the Shanghai company.

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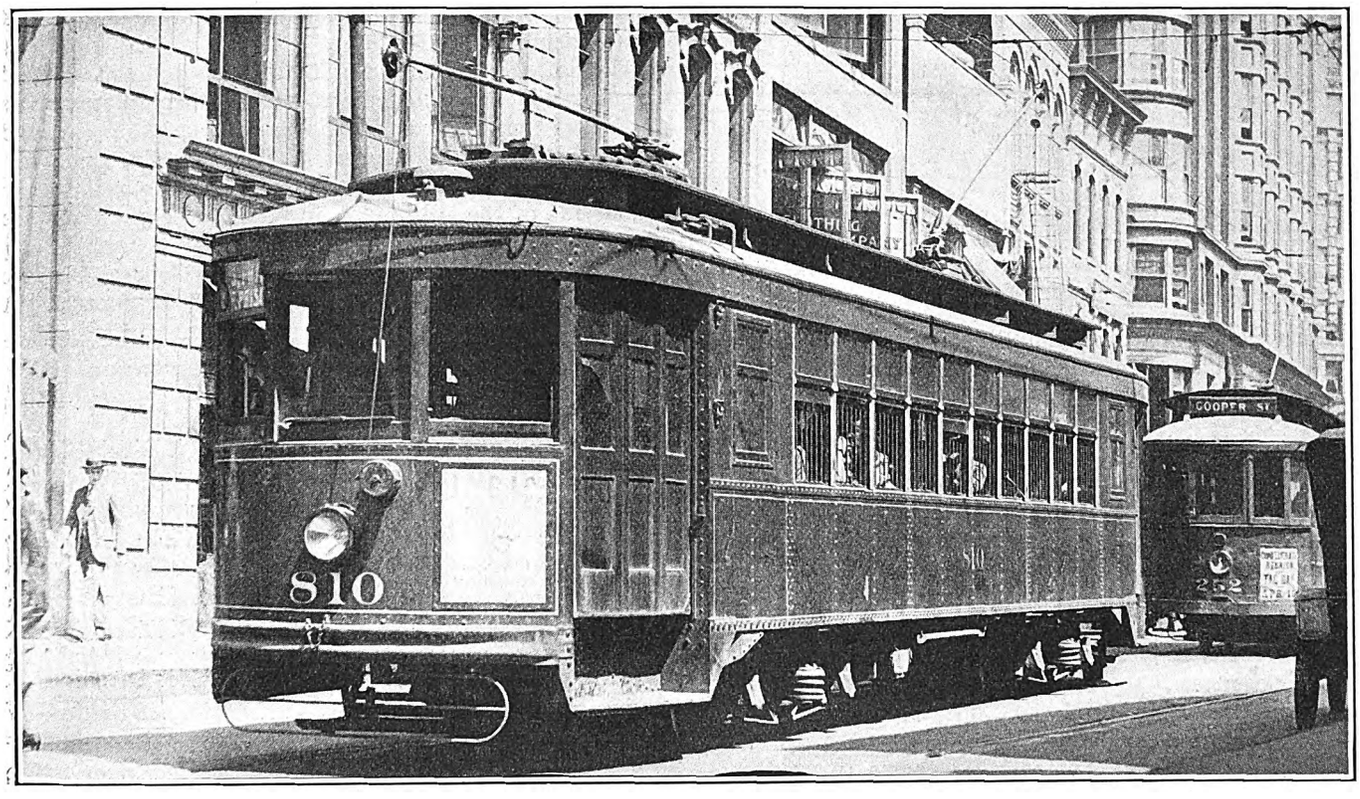
New Atlanta Cars Have Unusual Features

**Special Rack and Lever Mechanism Is Used for Raising Windows—
Sliding Doors Consist of Three Hinged Panels—
Total Weight Is About 35,000 Lb.**



Three-Panel Sliding Doors and Window Guards Fastened to the Lower Sash Are Features of New Cars Recently Put in Service in Atlanta

COINCIDENT with the recent passage of an ordinance abolishing jitneys in Atlanta, the Georgia Railway & Power Company placed in operation twenty new cars as a step toward improving the local transportation system. These cars were built by the Cincinnati Car Company and differ in many respects from others heretofore operated in Atlanta. In an effort to provide passenger comfort as well as utility and economy in operation several novel features were included in the design.

The over-all length of the new car is 46 ft. 2 in. This is 18 in. longer than the largest cars now in use. The ends of the vestibule are well rounded and the same curve is continued back to the body corner posts. A pleasing effect of symmetry is thus secured and also the same clearance on curves as is now obtained with shorter cars. The appearance of the new car is further enhanced by a reduction in body height between the stills and the roof and also by the use of small diameter wheels.

An attractive feature from the point of view of the passenger is the arrangement of windows and guards. The upper sash is stationary, while the lower sash is raised by means of a special rack and lever mechanism, enabling the passenger to open or close the window easily. Guards are an integral part of the sash, being connected to the bottom rail. When the window is closed slide into pockets, giving unobstructed vision and also facilitating window washing. When the window is raised the guards move into position automatically.

Sliding Doors Preferred Because of Narrow Streets

Another unusual feature of these cars is the type of sliding door used. This is made in three panels, fastened together with continuous rod hinges. It is expected that this hinge design will prevent the warping and binding which sometimes occur with wide sliding doors. The vestibule door opening is 50 in. wide. Stationary steps are used and the bottoms of the doors are equipped with aluminum guards which cover and protect the step wells when the doors are closed.

With a view to preventing accidents, sliding doors were adopted for the new cars instead of the type of folding door previously used. On account of the narrowness of many of the streets in Atlanta there is likelihood of an outside folding door catching in automobiles and other vehicles. Experience with the new sliding door has so far proved entirely satisfactory.

Platforms, steps and the adjacent street are brightly lighted by groups of five lamps placed over each vestibule door. These burn only when the doors are open. This arrangement not only prevents danger of accidents

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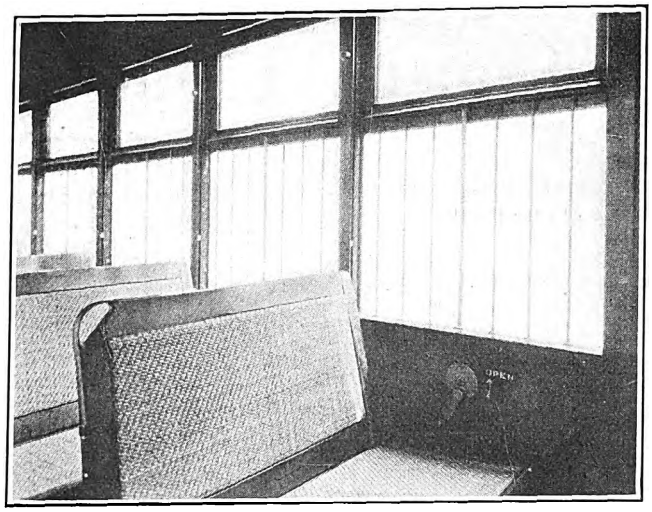


Windows Are Raised and Lowered by a Rack and Lever Mechanism

to passengers boarding and alighting but also serves as an indication to approaching vehicles that the car has stopped.

Reasons for Return to Monitor Roof

Although the last several lots of cars purchased by the Georgia Railway & Power Company were equipped with arched roofs a reversion to the monitor type was made in the new cars. This was done for two reasons. In the first place, the management believes that better ventilation is secured with a monitor roof. In the second place, it is thought that an arched roof acts to some extent as a sounding board and echoes inside the car body the various noises of operation.

Exterior painting is olive green trimmed with white. Special pressed steel bumpers, as shown in an accompanying illustration, add to the rounded appearance of the vestibules. Inside the body is finished in cherry, stained and rubbed down to a soft natural shade. Brown battleship linoleum is used on the floor, except in the aisle, which has wood wear strips. Uninterrupted passage from the platform to the car body is obtained by the elimination of closed bulkheads.

Pockets for the sliding doors extend in toward the center of the car a distance equal to the width of the longitudinal corner seats. This arrangement may be seen in an accompanying illustration.

Seating capacity is provided for 48 passengers. Seats are of wood, rattan covered. They are 34 in. wide and are spaced 29¼ in. apart. The aisle is 24¼ in. Artificial lighting is by two rows of electric lamps directly over the seats. This position for the lights is preferred because no shadows are cast on a passenger's newspaper. Twelve electric panel heaters have been installed. These are arranged to maintain a constant temperature of 56 deg.

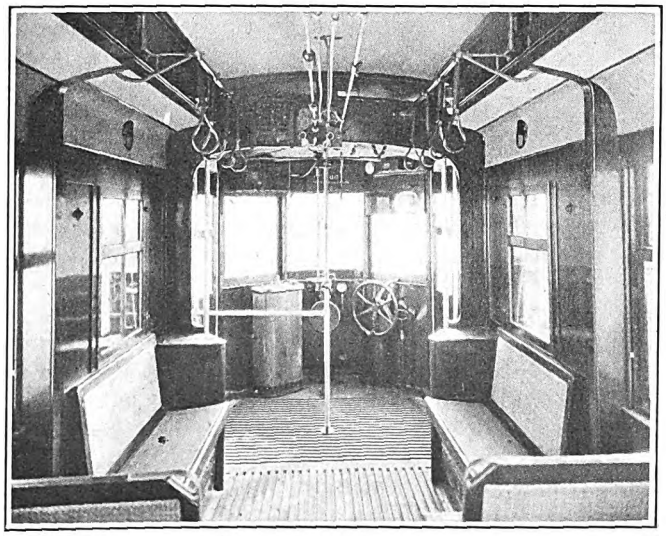
Entrance and exit are facilitated by the use of small wheels and low steps. The wheel diameter is 26 in. From the rail to the first step is 15¼ in. and from there to the platform 14¼ in. A 3¼-in. ramp has been made in the car floor. Height from rail to the underside of the sill is 28 5/16 in. Inside height from the floor to headlining is 7 ft. 11⅜ in.

Electrical equipment consists of four General Electric type 265-A motors and double-end K-35JJ control. A line breaker is located underneath the car floor. The weight of the electrical equipment is 1,120 lb. and the four motors 6,340 lb. The total weight of the entire car is 35,000 lb.

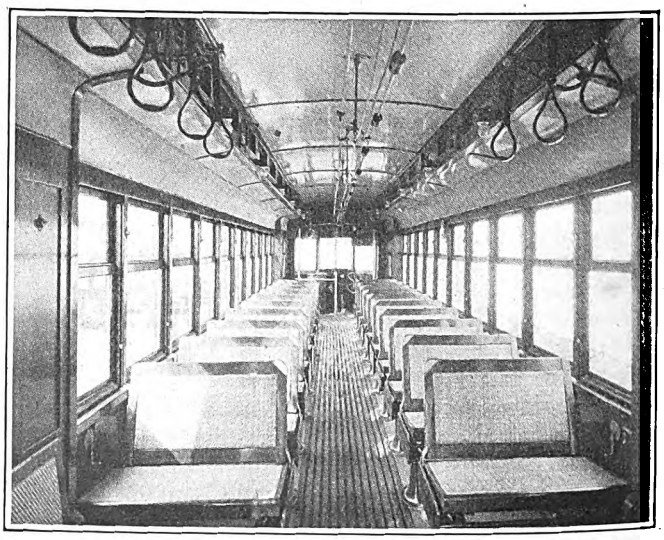
Weights and dimensions are given in the accompanying table. A few minor variations exist between the dimensions of the finished car and the specifications published in Electric Railway Journal March 28. At that time a list of equipment used on the cars was given.

PRINCIPAL WEIGHTS AND DIMENSIONS OF NEW ATLANTA CARS

Weights:	
Car body	16,695 lb.
Trucks	9,360 lb.
Motors	6,340 lb.
Electrical equipment	1,120 lb.
Air brake equipment	1,485 lb.
Total	35,000 lb.
Length over all	46 ft. 2 in.
Length over dashers	45 ft. 4 in.
Length of body	33 ft. 2 in.
Length of platforms	6 ft. 1 in.
Length truck centers	20 ft. 6 in.
Truck wheelbase	5 ft. 0 in.
Height rail to top of trolley board	11 ft. 2⅛ in.
Width over all	8 ft. 3⅜ in.
Width at side sill	8 ft. 1 in.
Width over vestibule corner posts	6 ft. 9 in.



Steel Semi-Bulkheads Extend into the Car a Distance Equal to the Width of Longitudinal Seat



Artificial Illumination Is Provided by Two Rows of Electric Lights Directly Over the Seats

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The Readers' Forum

Welding and Boring Cost Less than New Bearings

April 29, 1925.

To the Editor:

I have read with a great deal of interest your editorial entitled "Repair Equipment Parts Before Excessive Wear Occurs." Your paper has also published a number of exceedingly interesting articles along these same lines in regard to methods pursued by the different railroads in connection with bearings, housings, axle caps and motor frames. Is it not about time to emphasize more strongly the importance of welding and boring? It is possible to point out from actual figures the low cost of this work so that a certain standard can be followed by the railroads in general, as very often the master mechanic of a smaller property is able to have his manager approve expenses if these are along the lines of standardization as adopted by the association or the largest railroads.

In my opinion many master mechanics would be surprised to learn how cheaply welding and boring can be done if they would look into the matter carefully. In fact, I know of a number of roads that have bored several thousand motors. Figures from these companies show that the welding and boring does not cost as much as one set of new bearings, four in number. Shimming should not be referred to as poor shop practice, or as no longer necessary; it should be outlawed and never should have existed, for reasons readily appreciated if a mechanical man gives serious consideration to them. Why is it the railways always can find enough money to purchase new bearings which are put in old frames or heads and quickly ruined, and cannot find sufficient money to weld and bore?

Although some railways keep a record of the pressure necessary to insert bearings in the armature heads and check the clearance between gears and pinions after bearings are worn, still few follow up the matter so as to obtain beneficial results.

AN EX-MASTER MECHANIC.

Age-Life Method of Valuation Deals with Averages

MINNEAPOLIS, MINN., April 8, 1925.

To the Editor:

Your editorial of April 4 commenting on the three recent valuation decisions in Denver, Duluth and the Twin Cities ends by hoping that they will "establish additional precedents leading to more accurate statements by consultants of this class," referring to the cities' consultants.

As one of the bases for criticism you refer to the treatment of track by the consultant for the city of Denver, stating that the value of some of it "was listed as less than zero, and subtracted from the total of the remaining property." This, of course, is not true.

Briefly, the situation was this. The city used, as a basis for its calculation of accrued depreciation on the age-life method, a certain life for all track in the city. It so happened that there were a number of instances of lightly used track where the age had exceeded this average estimated life, which of course is a situation always to be expected when averages are used. The company's expert, in his jealous desire to pick flaws in the city's case, capitalized this to the extent of presenting an elaborate exhibit showing that these particular stretches of track, if calculated separately on the basis of their individual ages and the average life assured for all track, would then stand in the city's appraisal at a depreciated value less than zero. The futility of this exhibit was immediately noted by the master hearing the case, who stated that if the life used was correct, an exhibit showing cases where the condition calculated on this basis was too high could just as effectually be set up.

This defect in the city's case, if it was defect, is inherent in every instance where averages have ever been taken as a basis for any calculation. Similar criticism could be made of both the city's and the company's appraisals of track in the matter of unit costs, as in each appraisal the same average unit costs per track foot for the same type of track were used whether the track was located in the congested downtown section or the outlying sections of the city, where the labor cost of installing would be considerably less.

The reference to "more accurate statements" is well taken, but, as is often the case, should be applied both ways.

H. S. LANGLAND,
Engineer.

New Interstate Commerce Statistics

STATISTICS of the interstate railways of the United States for the year ended Dec. 31, 1923, have just been made public by the Interstate Commerce Commission. Some of the more significant follow:

STATISTICS FOR 1923,
INTERSTATE COMMERCE COMMISSION

Miles of track owned by Class I companies	278,915
Miles of track operated by Class I companies	385,855
Number of steam locomotives in service Dec. 31, 1923, all companies	69,005
Number of electric locomotives in service Dec. 31, 1923, all companies	409
Number of freight cars in service Dec. 31, 1923, all companies	2,410,007
Number of passenger cars in service Dec. 31, 1923, all companies	57,159
Number of company service equipment in service Dec. 31, 1923, all companies	112,426
Number of passengers carried, all companies	1,008,537,863
Number of passenger-miles, all companies	35,294,178,000
Number of passenger train-miles, all companies	573,938,043
Number of passenger train car-miles, all companies	3,616,342,000
Average journey per passenger in miles	37.97

Bill for Railway Policemen Disapproved

GOVERNOR SMITH on April 23 vetoed the Thayer bill amending Section 88 of the railroad law, authorizing superintendent of state police to appoint railway policemen on request of express companies and electric railways. This measure was strongly opposed by the State Federation of Labor and the railway workers. It was requested by the American Railway Express Company.

The Governor approved as Chapter 684 of the Laws of 1925 the Nicoll bill amending the New York City rapid transit act authorizing the sale of magazines, books, flowers and confectionery and the advertisement thereof in subways.

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Association News & Discussions

Rail Welding the Topic at American Welding Society Meeting

Symposium by Electric Railway Engineers Is Devoted to Discussion of Methods in Use on Various Properties—New Officers Elected

ELECTRIC railway subjects featured the annual meeting of the American Welding Society, held in the Engineering Societies Building, New York City, April 22 to 24. The morning of Wednesday was devoted to meetings of the resistance welding and gas welding committees. In the afternoon the electric arc welding committee met and in the evening the educational committee discussed plans and ways and means for carrying them out.

On Thursday morning the annual business meeting was held. It included the usual reports and the announcement of the election of officers, as follows: A. G. Oehler, New York, president; George Bird, Atlanta, and C. S. Smith, San Francisco, vice-presidents; James Burke, Erie; Joseph Meadowcroft, Philadelphia; S. W. Miller, New York, and H. A. Woofter, Lynn, Mass., directors-at-large.

The fourth annual dinner of the society was staged at the Park Avenue Hotel Thursday evening and was attended by more than 100 members and guests. T. A. Wry of the General Electric Company, vice-president of the society, acted as toastmaster.

Friday, from 9:30 o'clock in the morning until 2 o'clock in the afternoon, was given over to the technical session of the meeting. It consisted of a symposium on two subjects, "Methods of Inspecting Welds" and "Testing the Skill of Operators." Short papers were offered by about 30 experts in the different branches of welding. Abstracts of some of those relating to welding of rail joints follow:

Rail Joint Welding on Eastern Massachusetts

BY FRANK B. WALKER
Chief Engineer Eastern Massachusetts Street Railway

THIS discussion only treats of twc points, namely:

1. Training of welders.
2. Inspection of finished work.

Whatever measure of success we have had with the metallic arc process of welding has been due to what we are pleased to call the development of the technique of welding. When we began this process, in 1921, we hired an exceptionally good welder to act as a welding instructor and began the training of picked, green men.

Due to the volume of work and the press of time, we also hired experienced welders, whenever possible. However, probably 90 per cent of all our men were trained by our own instructor and were invariably better men than the so-called "experienced men" who came looking for positions.

In pickin⁄ the applicant for training, we were particular that he be young, or at least not so old but that he was still mentally and physically flexible, was in good physical condition, possessing both hands and feet, as well as good eyesight and hearing.

The trainee was first taught the difference between the two general types of welding machines, i.e., resistance and motor generator or dynamotor type, the class of work done by each and why; the polarity of the welding arc of each type, and in the case of the motor-generator machine, how to change the polarity of the arc.

He was also taught the rudiments of the care and operation of the two types of machines, paying attention to the importance of cleanliness and lubrication, and with due emphasis on the fact that in starting a machine correctly the last thing done is to apply the power, while in stopping a machine the first thing that should be done is to shut off the power.

In addition to the above, the operator was continually importuned to develop (if he did not already possess it) a sense of pride in the appearance and quality of the work he was doing as well as the appearance and condition of the machine he was working with, and last but not least a sense of responsibility for "safety first" as it applied to himself, the workmen busy around him and the public at large.

When it came to the actual handling of the electric arc, the two essentials of metallic arc welding, viz.: absolute cleanliness of all welding surfaces and the use of a short arc, were continually emphasized and held up before the operator, as the observance, or lack of observance of these two points, spell success or failure in this type of welding.

For our type of work the actual training of the men consisted of intensive training in a few simple exercises, as for example:

1. Striking the arc without sticking the electrode and breaking the arc without causing a deep, spongy, oxidized crater.
2. Welding parallel beads in a flat position.
3. Filling in the space between parallel beads by depositing a half-moon bead. We do not allow the use of the straight or "inch-for-inch" bead.
4. Building up a pad of metal 3 in. x 6 in. x 1 in. in height in the flat position.

After the trainee became proficient in the above exercises, he repeated them on a flat plate, in the vertical position.

The last step was a repetition of these exercises on a flat plate in a straight overhead position.

The trainee was shown by observing the shape and color of resulting beads whether or not his arc was of proper length and whether the voltage or current gave the correct heat.

Our system of inspection as finally developed practically made certain that every operator's work was under continuous inspection.

In the first place each welder was supplied with a stencil number which he stamped on each joint welded. These numbers were, of course, recorded so that any one interested could tell immediately the operator doing the work. This practice gave the operator a sense of responsibility and had a tendency to do away with carelessness on his part.

To further check up the operator's work it is our practice for the foreman in charge of the track job to test out at least one joint of each operator's day's work, the usual practice being to inspect all the joints, picking out those which are at all questionable, so far as appearances are concerned, and then trying to break them off by means of a hammer and wedge.

Then, of course, there was the continual inspection by the welding engineer and welding instructor. These men were in communication every day, and arranged that between them all welding jobs were covered by one or the other every three or four days. This work being scattered over 640 miles of track, it required 50,000 miles of traveling a year on the part of these men.

In addition, a winter track school was held, which was attended by all engineers, managers, superintendents, roadmasters and track foremen. Among other subjects, track welding and bonding were thoroughly discussed by means of an illustrated talk. The various important points, such as the absolute necessity of clean welding surfaces and the use of a short arc, were illustrated with lantern slides, showing the appearance and quality of the finished work, using the short arc and also using a long arc. The distinguishing marks being very definite, that once learned, our supervisory force did not need to be welding experts to tell from a finished bead whether the operator used a short or long arc, or used the proper amount of current. The welding instruction was in two parts, viz.: the illustrated talk and discussion in the morning and the practical application in the afternoon. In the afternoon, all those attending the lecture were taken in hand by experienced welders and actually taught the rudiments of han-

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dling the arc. Of course, they did not become finished welders or even good welders, but they did acquire considerable beneficial knowledge and experience, which helped greatly toward the success of our joint welding.

The one outstanding point of all the various inspections was, and still is, that if a joint for any reason did not look A-1, it was broken open, and if they all looked good one or two were broken open anyway. This is rather rough treatment, but it does tell absolutely just how good a finished job we are getting. If there is any criticism or suggestion to make, we have the man's number on the joint to refer to. He is brought back and the points under criticism shown him, and if necessary he is given help to correct his fault.

This method of inspection was a big help in weeding out those welders who could not or would not learn to weld as we desired, for after a man had been thoroughly instructed and then had been checked up three or four times by means of broken joints, without showing any improvement, he was discharged.

The above methods of instruction and inspection, which so far as we can ascertain no other road has ever attempted, have made possible the welding and rehabilitation of many miles of worn-out open and paved track which otherwise would have had to be rebuilt with new rail.

Our proportion of weld failures is about one-tenth of 1 per cent per year.

Boston Welding Practice

BY H. M. STEWARD
Superintendent of Maintenance
Boston Elevated Railway

THE rail ends are milled square laterally and have an undercutting of $\frac{1}{64}$ in. in 12 in. Joint plates are of rolled section of medium carbon steel with a carbon content of 0.30 to 0.40 per cent.

The drift pin method of joint assembling is used whereby the rail heads are brought under moderate compression. Between the rail heads we place a soft steel insert $\frac{1}{16}$ in. in thickness. This insert projects $\frac{1}{8}$ in. above the running surface of the rail and after the joint is welded the insert is peened over and the joint ground off by a small reciprocating track grinder. Rail joint base plates are used and are welded to base of the rails. The joints are welded by the carbon arc process "B" method of seam welding. The welding rod used is $\frac{3}{32}$ in. in diameter by 24 in. in length, of the following chemical composition:

	Per Cent
Carbon	0.12
Manganese	0.41
Phosphorus	0.009
Sulphur	0.050
Silicon	0.07
Chromium	0.06

The rods are flux coated. About 1½ in. of welding rod is used per inch of seam. The top seams are double welded for part of the distance. The seams are preheated and postheated by means of the carbon arc. This is done by drawing as long an arc as possible and moving it slowly along the seam.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 8—Metropolitan Section, A.E.R.A., Engineering Societies Building, New York, 8 P. M.

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.

May 14-16—Massachusetts Safety Conference, Copley Plaza Hotel, Boston.

May 19-22—Chamber of Commerce of the United States, annual meeting, Washington, D. C.

May 20-21—Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 27-28—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

The welding current varies from 175 to 200 amp. at 25 to 30 volts. The length of the arc is approximately $\frac{3}{8}$ in. A welding crew consists of two men per machine. Only one man welds at a time. The operators relieve each other at intervals.

Before men are assigned to regular joint welding they first receive instruction in the care and operation of welding machines and make up test joints under the direction of competent instructors. These test joints are broken apart that the men may see the effect of the welding. When the men are considered competent to weld joints they are assigned to one of the regular crews for further instruction and, if they pass the final test, take their place as regular welding operators. The Boston Elevated Railway has no means at its own disposal of testing any joints other than by the destruction method, and this is done occasionally by the operators.

From time to time, however, full-sized joints or shorter test specimens are carefully and scientifically tested at either the laboratory of the Rail Welding & Bonding Company at Cleveland, Ohio, or at the Massachusetts Institute of Technology. In addition to these tests the results obtained by various methods of welding, variation in strength of current used, welding rods of different composition or of test sizes, etc., are tested by our chemists, Saunders & Franklin of Providence, R. I. These tests consist of chemical determinations and micro-photographs to study changes in the structure of the rail metal, joint metal and welding metal.

A careful and vigilant inspection of welding is made by the welding foremen during the welding and after the job is finished.

Carbon Arc Welding on Chicago Surface Lines

BY JONATHON WOLFE
Assistant Superintendent Track and Roadway, Chicago Surface Lines

FOR the ten or twelve years prior to 1907 practically all rail joints of the Chicago Surface Lines were cast welded. In 1907 the use of the Lorain electric bar weld (a resistance weld applied under a hydraulic pressure of about 45 tons) was begun, except that in the southern section of the city cast welds were continued until 1914. A total of approximately 183,500 Lorain bar welds were welded under contract by them, not including free reclamations.

A chart made of 175,000 joints, covering from one to ten years of service, showed less than 1 per cent total breaks per year.

A few thermit welds of the old non-insert type were installed in 1911 for experimental purposes. During 1915 approximately 500 thermit welds of the insert type were installed and last year we installed 643 additional insert thermit welds on several of our extensions.

Seam welding of rail joints by the carbon arc process was begun in February, 1919, and 905 joints were welded during the first year. With the many improvements developed in this process since that time we have continued to use seam welds and have installed more than 45,000 joints to date. There are now nine equipments in daily service, used both for joint welding and for spot welding worn special trackwork. Three additional type WW equipments have been purchased and are being put into service.

The seam weld has proved particularly fitted for the reclamation of the scattered broken joints. The work can be done during the daytime, when better inspection of the work can be made; there is no need for the installation of temporary crossovers, and car operation is interfered with very slightly, cars being permitted to pass over the joints after completion of each seam. Considering that rails ranging from new to those almost worn out have been seam welded our proportion of failures is quite low.

Inspection of seam welds is an extremely important factor if uniformly good results are to be secured, and unless the welding operators have been thoroughly instructed until they follow

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the rulings and approved methods of welding the joints will certainly not hold up as long as they should. With Lorain bar welds, which were welded under contract, and with the thermit joints, the principal part of which consists of a chemical reaction, the inspection is much simpler, as there are fewer variables which can affect the quality of the weld.

Of primary importance in securing a good joint is the preparation of the joint before welding is begun. The ties must be firmly imbedded in the track foundation and the rails fastened securely to the ties so there is no movement in either ties or rails. With the best possible welds, using the toughest electrodes available, the number of failures will be much greater if the rail ends are working up and down under the passing cars, as the weld would be subjected to alternate strains that must eventually crystallize and crack the seams.

Welding plates must be made so as to fish perfectly with the rails—we are using practically all machined plates—and where plates must be upset to connect with worn rails or rails worn different amounts, the corner is planed square so that the worn rail having the thinner head will be supported to the end of the rail.

To determine the proper size of the joint plates for seam welded joints with various girder rail sections, no information of this nature being available, we followed these general rules shortly after beginning the use of this process:

1. The cross-sectional area of the two bars at the joint should at least equal the cross-sectional area of the rail to be welded.

2. The combined lengthwise sectional area of the four welding seams on either side of the rail joint (assuming ¼-in. penetration) should equal the cross-sectional area of the rail to be welded.

Care must be taken that the plates are put on the joint properly so that they will be vertical and the sloped edges engage the head and base of the rails evenly. The bolts must be installed and tightened as far as they will turn without stretching. All joint plates and rail ends, whether new or old, should be vigorously brushed with a stiff wire brush and, if necessary, cleaned with a file and chisel. Where compressed air is available, I would recommend the use of a portable sand blast for cleaning both rail ends and plates. Any rust, scale, concrete or dirt in or along the seams to be welded will not only lessen the depth of penetration and form inclusions that may start seam cracking, but may keep the plates from having a good mechanical fit and thereby introduce additional strains in the joint.

Rail ends should be tightly butted together and under compression before welding is started. Where possible this should be accomplished without the use of insert shims; on new construction work the rails can usually be driven back by using wedges in the joint ahead. On reclamation work the cut-in piece may be installed at lower temperatures than when welding is done, in which case the ends are usually so tight that no insert can be inserted. We carry inserts in stock and with each welding equipment. These vary in thickness from $\frac{1}{32}$ in. up to $\frac{3}{8}$ in. and to conform in section to the heads of our standard rails, and 1-in. x 2-in. shims for odd rails. Where there is any opening between the rail ends which cannot be closed otherwise, we drive in the largest single shim required to give a tight joint, first driving temporary wedges under the bases of the rails to widen the top part of the opening. More than one insert is not used at a joint if possible to avoid it.

We have found that joints of the same kind welded in cooler weather have held up better than those welded in hot weather. Our latest practice on new construction or on rail renewals is to weld at night or during the early morning when the rails are laid in the warmer months, thus both securing compression at the rail ends and lessening temperature strains during cold weather.

When the joint has been properly prepared and inspected by the operator, welding of the seams is started. Our standard welding gang consists of five or six men, depending on the density of car and vehicular traffic. The welding operator and two helpers are with the welding machine, one helper taking care of the pole hooking onto the trolley wire and watching traffic. The other helper supplies the operator with welding electrodes and sharpened carbons, watches the machine and takes care of the welding screen. Where traffic is very heavy an extra man is used as a watchman. A grinder operator and one helper run the Atlas rail grinding machine, with which all joints are ground to a smooth surface. A four-wheel rubber-tired trailer is used for transporting the equipment, the welding machine being mounted on one end, the tool box on the other and in the middle, which is depressed, is space for carrying the Atlas grinder.

The upper seams are welded to within 2 in. of the ends of the plates, the lower to within 1 in. or less. The so-called "AA" method is used, with a double seam on the middle 8 in. of the upper seam and a gap of 6 in. left unwelded on the lower seams, with about 3 in. of double seam each side of the gap. The amperage used varies from 275 to 325, depending on conditions at the joint. The exact adjustment of the resistances is left to the judgment of the operator, who determines by the way the electrodes flow when he has the correct adjustment. The length of arc used is about $\frac{3}{8}$ in.

A large percentage of the joints welded on reclamation work are upset various amounts, and as these plates are made with ⅛-in. variations in the upset, it frequently happens that there is a considerable difference in the height of the rail ends when the joint is prepared and ready to weld. We have found that the pounding of the cars over these joints while the different seams are being welded and before surface welding with high carbon is likely to start seam cracks. Therefore, whenever there is any pronounced difference in the rail end heights, we build up the top surface of the joints with high carbon electrodes, using the metallic arc process, and grind the joint before starting the seam welding. After the seams are welded we again grind the joint slightly to make sure that the finished joint has a smooth, even top surface.

For the inspection of the finished joints we have built up from experience a method which is satisfactory and has resulted in greatly improving the quality of the joints.

We have conducted tests at different times to determine the proper kind of electrodes. Welds were made on mild steel plates and tested mechanically and chemically. For several years we used the American Bureau of Welding Specification E-No. 1-A for low carbon electrodes. This specification, which was made primarily for metallic process shop work, is not sufficiently rigid in my opinion for the requirements of a welded rail joint, subjected to the continual shock and vibration of passing car wheels, where ductility is so all important. I mean ductility or toughness that will continue for the life of the rail and not permit crystallization of the weld to cause the seam to fail before the rail is worn out. For the last year we have used the coated low carbon electrodes (grade 200) having a manganese content around 1 per cent, and are getting a better, tougher seam than before.

There are some simple tests which can be used to advantage by the individual street railways in determining ductility of the seams, etc. To what extent such tests are used will depend on the viewpoint of the particular railway. The following are just a few tests that, while not new, are simple, easily made and give comparative results for determining proper grades of electrodes:

(a) Weld together two "V" pieces of mild steel, subjecting both parent metal and the weld to mechanical, microscopic and chemical tests covering structure, hardness, composition, etc.

(b) Weld at right angles to each other two plates of mild steel, place one in a vise and determine to what angle the other plate can be bent before fracture occurs.

(c) Weld upper seams of sections of welding plates to the head of standard rails, the plates being fished into the rail. The amount of pull necessary to bend the plate out from the rail until fracture occurs and the angle at which fracture occurs can then be determined.

Our experience has indicated that with bare electrodes a better weld is secured by using flux, and instructions to the operators require its use. We use the powdered flux furnished by the Rail Welding & Bonding Company. One advantage of the coated electrode is that the flux is furnished in uniform quantities.

We hold meetings at which all division superintendents, welding foremen and welding operators are present, and at some of these meetings have samples of welds, test pieces, etc. In the discussions which follow many good points are brought out, instructions are issued covering future work and the operators brought in touch with each other's work.

Methods used for testing the skill of the operators are somewhat involved with the course of training for oper-

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ators, and our practice is considerably different from that commonly in use for shop work owing to the difference in the nature of the welding done.

The skill of the operators is mainly checked by inspection of the welding done by them and by the way in which their joints hold up under service in the track. Each operator has a metal stamping die with an individual letter with which he must stamp every joint welded by him, and it is usually possible to identify any particular joint. It is comparatively easy to judge the quality of seam welding by visual inspection, as poor work shows up very plainly in uneven and ragged seams, burnt metal or deep holes in the seams. We also rely to a large extent on the meetings, previously mentioned, which are held in our office at stated intervals. Here are brought up criticisms of any welding being done, with samples of such work shown, and means to correct faults brought out through discussion.

Welding in Washington

By R. H. Dalgleish
Chief Engineer the Capital Traction Company

TWO methods of electric welding are now used quite extensively for welded rail joints, the metal electrode and the carbon electrode methods. The welder on this class of work is at a great disadvantage in that he is necessarily in an uncomfortable position, disturbed by vehicular traffic, and on a majority of jobs he is interrupted by passing cars. This has a tendency to distract the welder from his work and makes it very hard for him to keep his mind on what he is doing. A good welder on shop work is often unable to do good work on rail joints in the street, so it is necessary to use great care in teaching them how to do this work. Welders are first taught to weld in the shop in the position required in the street. This is done to get them used to this method before subjecting them to the traffic distraction. They are then sent out with an experienced welder until they are able to work by themselves.

When preparing rail joints for welding, the rails are first cleaned of all scale, rust and grease, as are also the joint plates. The plates are then bolted to the rails and the rails carefully lined up to get the gage line straight and the joint even at the top. After welding, the rail head is ground with a reciprocating grinder in order that there will be no uneven joint for the wheel to come in contact with.

The ends of the rails should be carefully cut to make a tight joint before the plates are welded to the rails. In order to insure tight joints between rails, the spacing of the holes in the rails is slightly greater than in the plates and drift pins are driven in to draw the rails together before welding. The heat from the welding, of course, tends to expand the rail and draws the joints up still tighter.

The welding is started on the outside top seam and next the inside bottom seam; next inside top seam and last outside bottom seam. This distributes the heat somewhat and has proved to be quite satisfactory, although I am sure that welding the seams in another order will be satisfactory so long as both seams are not welded on one side of the rail before any welding is done on the other. When this is done, it tends to kink the rail.

A $\frac{5}{16}$-in. rod of low carbon steel is used for metal electrode welding, with 125 amp. at 60 volts, about $\frac{1}{8}$-in. arc.

After welding, inspection should be made of alignment of rails to see that the gage line is straight. The weld metal should be laid on in even layers and the uniform corrugations will show the metal deposited evenly. Examination should be made for burned spots in the seam. An examination of the seam should be made to see that the metal is evenly placed on both plate and rail, in order that the maximum strength may be developed at the joints. When rail is welded in one length $\frac{1}{2}$ mile or more long, the joint is subjected to severe tensile stress, in addition to the vibration set up in the rail due to the movement of cars over the rail. This requires careful work and inspection to prevent failures.

With the carbon arc method of rail joint welding, the skill of the welder is the predominating factor, and the difficulty in getting welders who will turn out uniform work makes it very difficult to get satisfactory results. We have had so much difficulty getting uniform results with the carbon arc method that we have discontinued the use of that type of joint and we are now using metal electrode welding for all seam-welded rail joints.

After welding with the carbon arc method, it is almost imposible for an inspector to eliminate the bad joints due to the uneven deposit of metal and the fact that on practically all joints burned spots may be found which may or may not be burned metal. In preparing joints for carbon arc welding, the plates and rail are treated in the same manner as in metal electrode welding. A deflector bar is used to deflect the metal into the seam. In some cases a $\frac{5}{32}$-in. rod of mild steel is laid in the seam and burned in place by the carbon arc. Another method is to hold a $\frac{5}{32}$-in. rod in the left hand and the carbon pencil in the right hand and thus burn the metal into the seam.

A long arc with 275 to 300 amp. at 60 volts is used for this class of work, and with that much current it is important that the arcs be moved at a uniform rate of speed to prevent burning the metal. The average cost of this type of joint is as follows:

COST OF ONE ARC-WELDED JOINT

Joint plates, 1 pr.	$2.90
Welding rod, 1.8 lb.	.26
Carbon pencil	.05
Royalty	1.00
Welder, one hour	.75
Helper, one hour	.50
	$5.46

Central Traffic Association to Meet May 20-21

SEVERAL important items will be presented at the next regular meeting of the Central Electric Traffic Association, which will be held in the Tuller Hotel, Detroit, Mich., on May 20 and 21, beginning at 9:30 a.m. The first day's session will be in the nature of a round-table discussion, followed by committee meetings. The second day will be devoted to reports of committees and such other business as may be presented.

American Association News

Unification of Car Design

PROGRESS was reported at a meeting of the committee on unification of car design of the Engineering Association which was held in the Illinois Merchants Bank Building, Chicago, on April 23. Those present included H. H. Adams, chairman; G. L. Kippenberger, W. F. Graves, Charles Gordon and L. C. Sparks representing V. Willoughby.

It was the opinion of those present that the work of the committee should be devoted to the collection of fundamental facts and information which would tend to stimulate greater uniformity in basic car dimensions rather than to the development of any uniform design of car. The committee felt that the dimensions adopted in its previous reports establish a foundation and that it is not advisable to carry this process further until there is more general acceptance by the industry of the dimensions proposed, or until these basic dimensions can be revised so as to be acceptable.

For this reason, it was held that the immediate work of the committee should consist of the collection of data to determine the limiting clearances which fix the dimensions of cars used on various properties. Mr. Graves said that the way committee collected considerable data on track centers and minimum radii on various properties, and volunteered to look this matter up and furnish the chairman with this data. Mr. Kippenberger pointed out that the lack of available information on limiting clearance dimensions was a serious handicap in the attempt to develop any form of car which could be used on a large number of properties.

The committee felt that this clearance data would enable it to determine the proportion of properties that could use cars of uniform dimensions, and that this would be a valuable guide to the car builders in the design of cars that could be manufactured on a production basis at considerable saving in cost.

As the first step in this program, those members of the committee representing car builders will be asked by the chairman to compile a list of the clearance data which should be collected from various properties to determine the limiting dimensions of cars.

A motion picture, illustrating car building methods of the Chicago Surface Lines, was shown to the committee to determine whether it should be exhibited at the time of presentation of the report at the annual convention as an illustration of the savings in construction costs which are made possible by uniformity in design.

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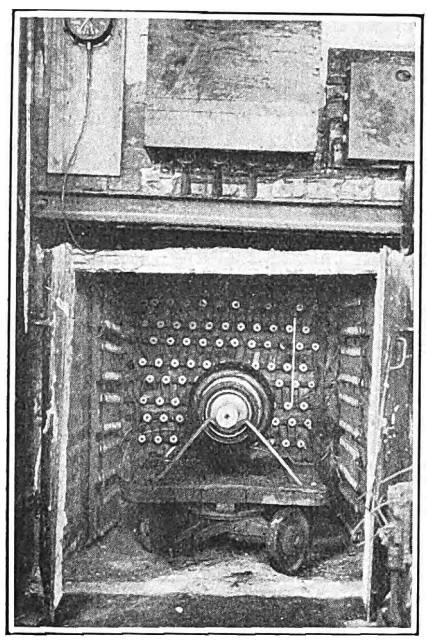
Maintenance of Equipment

Car Heaters Used in Small Baking Ovens

DIPPING and baking of armatures is done by the Milford & Uxbridge Street Railway in a small plant recently built at its shop, Milford, Mass. As this company is comparatively small and as it has but few armatures which require



Home-Made Baking Oven Built Under the Carhouse Floor by the Milford & Uxbridge Street Railway

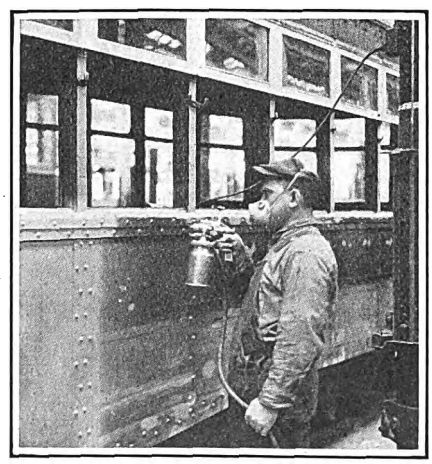
dipping and baking treatment, it was decided to construct a home-made plant rather than to purchase one from a manufacturer. In the past somewhere from 24 to 48 armatures have been rewound annually in these shops. It is expected that this number will be reduced materially in the future.

The floor of the armature room in the Milford shop is about 5 ft. below the floor of the adjoining carhouse. It was possible, therefore, to knock a hole through the wall between the two buildings and to construct a brick baking oven under the carhouse floor. Old electric car heaters are used. Doors are of steel, asbestos lined. The control is manual with three electric switches, each connected to one bank of heaters. The switches are located in a box immediately above the oven door, as shown in the illustration. An electric indicating thermometer shows the temperature in the oven. It is planned later to connect up this apparatus as a thermostat to give automatic temperature control.

Dipping is done in an old air tank sunk into the floor in front of the baking oven. An overhead crane and chain hoist are used for handling the armatures. All three sets of heaters are used to heat up the armature before dipping. Under these circumstances the power needed is about 15 kw. After the armature has been heated and dipped the temperature is maintained by the use of only one set of heaters or at the rate of about 5 kw. The entire operation of baking requires from eight to ten hours, during which time about 40 to 50 kw.-hr. power is used.

Respirator Used with Spray Painting

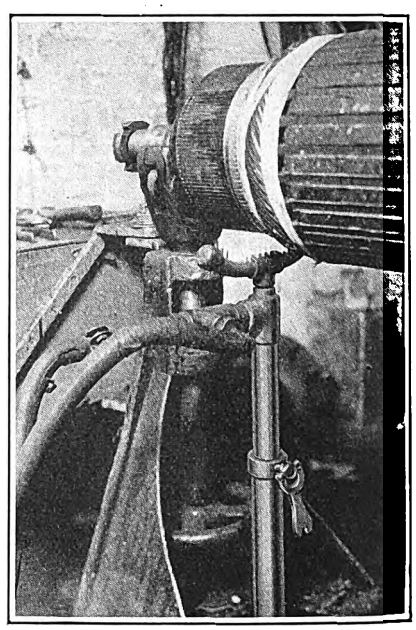
CAR BODIES are spray painted in the shops of the Department of Street Railways, Detroit, Mich. To facilitate the painting, the window guards are removed and the windows are either raised or taken out entirely. As a protection against the breathing of paint fumes, each painter is supplied with a Covers patent respirator. This overcomes any objection to the use of spray painting as being injurious to the workman.



For Use with the Spray Painting Method for Detroit Cars a Respirator Protects the Workman

Preheating Commutators Reduces Time to Solder

HAND soldering of armature leads to the commutator is used in the 65th Street shops of the Third Avenue Railway, New York, inasmuch as the amount of this work is rather small. The time of soldering



Preheating a Commutator Previous to Soldering Is Made Easy by Means of a Shop-Constructed Gas Burner

an armature of average size has been reduced from 1½ hours to ¾ hour by preheating the commutator previous to soldering.

The apparatus employed consists of a pipe framework for conducting the gas and air used for heating to a curved burner. The burner is made of ½-in. pipe with the ends bent upward and with a row of $\frac{3}{32}$-in. holes along the top. Standard pipe caps are used to close the ends of the pipe and a T-connection at the center serves as a support. Gas and air are brought to a T in the upright connection through a flexible hose, which is of sufficient length to reach from the wall to the various winding stations in the armature room. The lower part of the upright pipe, which is fastened to the burner, slides in a larger pipe, so that the height is adjustable. The larger pipe is bolted to three sheet-steel

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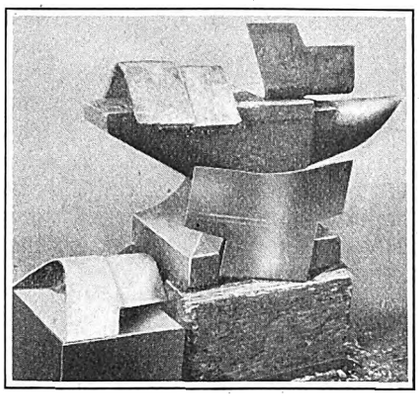
legs approximately ¼ in. thick, which are sharp at the bottom to prevent slipping. After the height of the burner is adjusted to suit the diameter of the commutator to be soldered, the inside pipe is clamped in position by means of a hand screw. Shut-off cocks installed in the pipe line regulate both the air and gas supply.

Convenient Form for Bending Corner-Post Irons

CORNER-POST irons which fit at the upper corners of the bulkhead on cars of the Eighth Avenue Railroad, New York City, are of very irregular shape. They have an offset along the surface as well as being bent to go around the corner posts. No. 12 gage sheet steel is used. In bending it a special form and pattern are used. The sheets are first cut to the desired shape by use of the pattern and then after heating in the forge they are lined up on the form and bent to the desired shape in the forge shop. This method insures that all corner-post irons are interchangeable and also facilitates their being made up in quantities, which further reduces the cost and enables them to be made during slack hours.



Form and Pattern for Bending Corner-Post Irons

The form for bending is shown on the anvil and the pattern labeled "sample" rests against the anvil. A partly completed corner-post iron is shown at one end of the anvil and a completed iron on the box at the end of the anvil.

Maintenance Practices on the New York State Railways

Slotter Combined with Banding Lathe

COMMUTATOR slotting and banding can be done without removing the armature from the lathe in the Utica Park shops of the New York State Railways through the use of a slotter that has been added to the banding lathe. The commutator slotter pivots about a vertical post. Thus it can be swung out of the way quickly so as not to interfere with banding.

The saw for commutator slotting is mounted on one end of an arbor with a pulley at the opposite end. The two bearings in the block supporting the arbor are made particularly heavy and long to insure rigidity. The block supporting the arbor is fastened to a carriage, which moves back and forth on two 1¼-in. round rods. At one end the rods are fastened to a large block, which serves as the central support and pivots about its vertical bearing. The other ends of the rods are fastened to a cross plate. The carriage is moved back and forth by means of an adjusting screw acting on a nut in the carriage. Rotation of the screw by means of the handle at the right moves the carriage.

The block shown at the left of the device, which forms the main support for the slotter, can be raised or lowered by means of an adjusting screw.

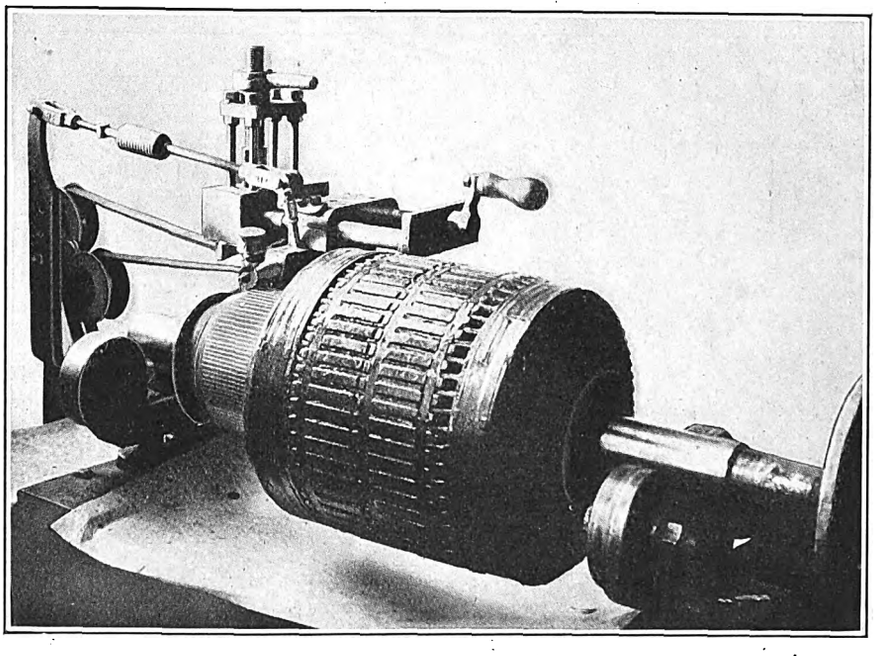
Four rods which are bolted into the body support a crosshead, and a screw working through this bears on the top of the vertical spindle. A handle attached to the top of the screw thus raises and lowers the block, so as to fit commutators of various diameters.

The slotter is driven by a type AA-1 compressor motor. An ingenious belt-tightening device is used. A vertical arm on which two pulleys are mounted is pivoted near the floor so that it can be moved back and forth in line with the pulley installed on the driving spindle of the slotter.

The belt coming from the top of the pulley on the motor passes over the lower pulley of the belt tightener, then around the driving pulley on the saw spindle, over the second belt tightening pulley and back to the motor. An adjusting rod extends from a clevis at the top of the belt tightening support to another clevis on the carriage of the slotter. The belt tightening pulleys thus move back and forth as the carriage is shifted so that the distance between the centers of the pulleys is kept constant.

The banding machine has a framework built of angles. One end of it fastens to the wall while the opposite end has legs for floor support. The machine is belt-driven through a worm gear, and a friction clutch transmits the rotation to the armature. A universal joint is used between the drive shaft and the friction clutch, so that exact lining up of the armature is not necessary for proper operation.

The armature is carried on pairs of rollers held in position by two pedestals. Adjustment to any de-



A Self-Adjusting Commutator Slotter Has Been Attached to the Banding Lathe in the Utica Park Shops of the New York State Railways

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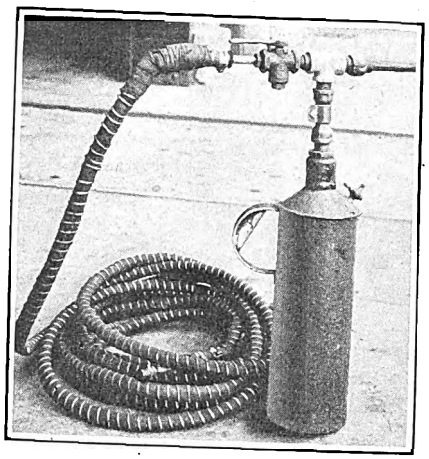
sired position is made by means of a lever. Supporting the armature on rollers protects the shaft from damage during the banding operation.

Outfit for Spray Painting Car Cables

CAR cables, motor leads, resistance leads, and splash guards are painted with insulating varnish while in place underneath car bodies of the New York State Railways, Syracuse Lines. It is impossible to do a satisfactory job with a brush due to the inaccessibility of many of the parts,



Spray Equipment Used to Paint Car Cables at Syracuse

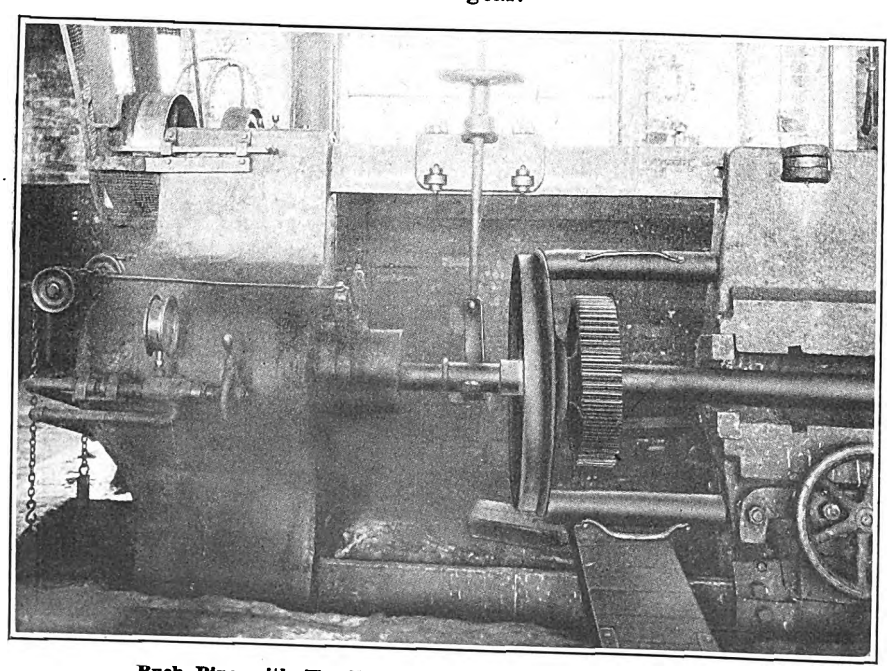
so the varnish is sprayed on with the home-made equipment shown in the accompanying illustration. A 1-gal. tank with handle and provisions for pipe connections at the top is used. The upright pipe connection has a ¾-in. tee, one end of which is used for the spray nozzle and the other for the air connection. A shut-off valve is placed in the air supply line between the hose and the tee.

With this connection, air at 75 lb. per square inch pressure from the shop supply is led to the top of the varnish in the receptacle. A ⅛-in. pipe runs from the bottom of the can through the upright pipe connections and bends to the right with its end just back of the reduced part of the nozzle, forming an atomizer.

The end of the spray nozzle is of ⅜-in. pipe, a reducer being used to fit it to the tee. With this apparatus leads and equipment under 40-ft. cars are painted by one man in approximately 10 minutes.

Special Push Pins for Wheel Removal

WHERE car wheels are large enough it is desirable to remove them with push pins placed over the outside of the gears. A convenient type of push pin with handles is used in the Utica Park shops of the New York State Railways. These are of 3-in. diameter steel and have two wrought-iron handles bolted to them for convenience in handling. To prevent the pins slipping against the head of the wheel press, their ends are turned down slightly, so as to have projections with a diameter of approximately 1½ in. The head of the wheel press is also counterbored to receive these projections. The accompanying illustration shows a 33-in. wheel in position for removal, with the push pins resting against its rim of the wheel outside the gear.



Push Pins with Handles Are Convenient for Wheel Removal

Taking Moisture Out of Air

COMPRESSED air is used extensively in connection with the maintenance work at the Wolf Street shop of the New York State Railways, Syracuse. For blowing out motors, controllers and other electric railway equipment, it is essential that the air be dry, as otherwise there is danger of short circuits and grounds. In sandblasting operations, moisture in the air clogs up the equipment, which causes trouble and delay. To take the moisture out of the air the supply line has been equipped with moisture traps at various points in the shop. The moisture trap illustrated is installed in the paint shop, where air is used extensively for sandblasting cars previous to painting and varnishing.

Air Moisture Trap

This moisture trap is used to keep compressed air dry in the Wolf Street paint shop of the New York State Railways.

This moisture trap is made of a 6-in. pipe 4 ft. long. Standard pipe caps are fitted to each end. The air supply from the compressor is led into the moisture trap about 8 in. from the bottom, and the inside of the trap from this point to the top is filled with excelsior. The supply line used for attaching connections for sandblasting comes out of the top of the moisture trap, and a drain pipe is fitted to the bottom.

Smaller size moisture traps are installed underneath benches and at points where connections are made for blowing out various parts of equipment. These are made of 2-in. pipe with standard caps and are about 2 ft. long. The air supply pipe in these smaller traps is led in about 3 in. from the bottom, and the connection for hose attachment is at the top. A drain valve is provided at the bottom. This arrangement of moisture traps has proved very effective in overcoming difficulties experienced from moisture in the shop air system.

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The News of the Industry

State Supreme Court Hears Cleveland Controversy

Arguments were presented before the Ohio State Supreme Court in Columbus, Ohio, on April 28, in the wage arbitration controversy between the Cleveland Railway and the street car men's union. Attorneys for the union argued in favor of a motion to have the State Supreme Court hear the case on its merits. In the court of appeals the men lost when that court held that the "closed shop" contract between the union and the company was null and void on the ground of public policy and also held that the increase of 12 cents an hour awarded by the board of arbitration of a year ago was illegal on the ground that the fifth and key arbitrator in the case was prejudiced against the company.

The Supreme Court is expected to hand down its decision on the motion shortly. If this decision is unfavorable to the union, it means that henceforth there will be no contract between the Cleveland Railway and the union, thus ending the closed shop agreement. It will also mean that the men will not receive any increase in pay dating back to May 1, 1924. If the court rules in favor of the men, the State Supreme Court will rehear the entire case again on its merits.

Great Northern to Electrify Line

Electrification of 30 miles of main line of the Great Northern Railway, extending over the summit of the Cascade Mountains in Washington, will proceed immediately, according to Ralph Budd, president. Mr. Budd estimated the cost of equipment for the new line at $1,000,000 and said orders would be placed for four electric locomotives. Power will be obtained from the company's water power plant on the Wenatchee River.

The Great Northern's electrification will extend from Skykomish, on the west side of the Cascades, to Verne, on the east side, just beyond the portal of a tunnel through which the road pierces the summit.

The Great Northern already uses electric engines to haul its trains through the tunnel at the summit, the bore being 3 miles long. Mr. Budd said that discussion of a Great Northern railway tunnel 32 miles long to pierce the Cascades and give a near level grade through Washington had not reached a definite stage.

Verdict Favors Dallas Railway

The State Supreme Court in the case of F. J. Geller, on appeal, has upheld the right of a city to regulate rates of public utilities without submission of any proposed change to the electorate. Geller attacked the right of the city of Dallas to grant a 6-cent fare to the Dallas Railway as authorized in an ordinance passed on June 24, 1922. He claimed that under the franchise to the company granted in 1917 the fare was set at 5 cents, and that this should be maintained for the life of the franchise. His contention was that no revision could be made without submission of the question to the electorate.

The trial court sustained the special exceptions and general demurrer of the railway and dismissed the case. On appeal to the Fifth Court of Civil Appeals, in an opinion by Chief Justice Sargeant, the right of the city to change rates by ordinance was upheld, but the point was made that the ordinance should be inoperative until affirmed by a vote of the people.

The opinion of the Supreme Court quotes at length from the city charter of Dallas to show that the power to make rates of any public utility operating in the city may be changed and regulated by the commission without submission.

$200,000,000 Transit System on Coast

Engineers See Ultimate Need of This Expenditure for Los Angeles with $133,385,000 Program Now—Plan Embodies Seven Principal Features

AN IMMEDIATE expenditure of $133,385,000 for the city and county's proposed rapid transit system was suggested by Major R. F. Kelker, Jr., Chicago, in a report made on April 20 to the county of Los Angeles and city of Los Angeles. The report is now under consideration by the city and county governments. It recommends the following features:

1. Construction of subways, elevated lines and open cuts to be financed either by the issuance of 6 per cent public improvement fund bonds or obligations of assessment districts.
2. The immediate establishment of a rapid transit committee consisting of representatives of city and county governments, railroad commission authorities and representatives of the Los Angeles Railway and the Pacific Electric Railway, as well as representatives of various civic bodies, banking institutions, etc.
3. Immediate unification of the Los Angeles city local transportation system to be operated as one unit, extended to meet the needs of a city of 3,000,000 population.
4. Adoption of a policy, fixing a definite program of construction for the rapid transit system.
5. A method of accounting for the investments made by the public and by private capital as a basis for possible purchase of the system by the city of Los Angeles.
6. Establishment of a flat fare zone and a basis of determining rates, transfer privileges and disposition of receipts.
7. A plan for managing and operating the proposed unified system, as well as plans for providing for the construction of additional transit facilities.

It was urged in the report that the best method of financing the proposed rapid transit system would be by special property assessments. This principle was applied to permit property owners to select the particular type of structure to be constructed on each route, such as preference for subways, elevated lines or open cuts.

The greater traffic plan provides for the elimination of downtown traffic congestion, elimination of grade crossings, furnishing increased riding facilities for the public both in the metropolitan area and outlying zones of the city.

The idea would be to keep fares down so that riders will patronize the fast lines, using the outlying surface lines and buses to feed the rapid transit lines.

The report features two extensive subway trunk lines through the downtown business district, with entrances every four blocks. At Seventh and Broadway, the hub of the city's dense downtown traffic district, would be established the chief point of transfer of the two main trunk systems. Surface lines and bus routes would be increased and used for feeders for the tubes.

The report does not claim that the $200,000,000 expenditure is essential immediately, but that sum would be needed fully to carry out the plan in coming years. Immediate expenditures would entail an initial outlay of $133,385,000 for the following track mileage: Subways and tunnels, 26.1; elevated and open cut lines, 85.3, and street railways, 41.6.

A statement of track mileage of the entire comprehensive transportation system shows 588.6 miles now existing and under construction, 153 miles to be added immediately, 233.1 for future construction, a total construction of 386.1 miles, with a unified system of 274.7 miles, within a radius of 8 miles from the hub of the downtown district, namely, Seventh and Broadway, Los Angeles.

The estimated costs of work intended for immediate construction are as follows:

Rapid transit lines, northeastern section of city	$33,043,000
Rapid transit lines, Hollywood district and western section of the city	31,359,000
Rapid transit line, San Fernando Valley district	4,678,000
Rapid transit lines, eastern section of city	28,951,000
Surface lines	4,006,000
Equipment: Cars, buses, substations, shops, yards, etc.	18,200,000
Pacific Electric Railway Lines' extensions	13,148,000
Total	$133,385,000

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In dealing with the Pacific Electric Railway expansion now, the report says:

Freight traffic on the lines of this company, as they exist on the east and south sides, prevents the co-ordination of these lines with the proposed rapid transit system. In order that these lines also may be utilized for urban rapid transit, it is recommended that the Pacific Electric make certain improvements. The major portion of which it now has in contemplation.

These improvements will provide facilities for urban rapid transit service in the northeast and southwest sections of the city, as well as for interurban service and freight service.

New Municipal Plan Proposed for Rockford

Seymour Stedman, president of the City-State Investment Company, Chicago, and Frederick S. Mordaunt, general manager of the public service utility department of that corporation, have placed a new municipal ownership project before the Rockford, Ill., City Council, more sweeping in its scope and utopian in its conception than anything Rockford has ever heard. The fight over renewal of the Rockford City Traction Company's franchise has been waging some time. The new proposition, filed in a sealed envelope with the city clerk, proposed that the City-State Investment Company join with the municipality in organizing, building and operating the city transportation system; that the city grant an all-embracing franchise, as liberal as Illinois laws will permit; that a financial program be instituted to give the city full control of the corporation without any investment, permitting the Council to appoint directors, executives and managers. The investment concern will receive 10 per cent of the construction cost and 10 per cent of the bond sale return.

The Rockford newspapers naïvely pointed out that under this financial arrangement, if the system represents a cost of $2,000,000, the Investment company will receive $400,000 for its promotion of the project and its activity.

Kansas City Bus Plan Progresses

Plans are going ahead rapidly for the early installation of Kansas City's new bus system, which is to be operated for a period of three years by the Kansas City Railways. The railways receivers have the final signed draft of Judge Kimbrough Stone's authorization of the acceptance of the conditions of the city franchise. They are said to have been notified previously that they might proceed with the plans for the expenditure necessary in purchasing buses, machinery and equipment, up to a certain maximum which has been set by Judge Stone, referee, at $750,000.

The service will utilize a total of 63 buses. The company has owned two of the buses for some time which have been operating in Kansas City, Kans., and it will be necessary to buy only 61 new buses now in order to care for the service properly. Nine routes are to be operated under the provisions of the ordinance, the fare to be 10 cents on eight of the lines and 25 cents on the remaining route, the latter being the only express service which will be maintained. Transfers will be given for interchange between buses and street cars for an additional charge of 3 cents.

Rainier Paving Dispute Aired Again

After a five-day hearing devoted to the taking of testimony, before Judge Edward E. Cushman in the United States District Court, in the suit of E. E. Markham and other property owners in the Rainier Valley district against the Seattle & Rainier Valley Railway, Seattle, Wash., both sides rested their cases and agreed to submit briefs. The suit originally was brought in the Superior Court of King County, but was remanded to the United States District Court for hearing. The property owners contend that the company, under the provisions of the franchise, is compelled to pave between the tracks on Rainier Avenue, and that failure on the part of the company to pave has kept the property owners from using their own property, increased fire risks, and deprived people residing in the valley of the use of public property.

In answer, the company contends that it has been relieved of its franchise mandates to pave by a special ordinance passed by the City Council; that the company is without money or credit to pay the $700,000 paving cost; that the more modern methods of handling traffic require separation of motor vehicle and street car traffic, and that by leaving the tracks unpaved, other traffic was forced to use the one-way paved strips on each side, much to the benefit of railway traffic.

Trolleys or Buses in Spartanburg to Be Decided May 12

The City Council of Spartanburg, S. C., passed an ordinance recently which calls for a special election on May 12, involving an amendment to the franchise now held by the South Carolina Gas & Electric Company whereby trolley service in the city of Spartanburg will be suspended as long as the company provides ample transportation service by means of buses. The amendment would add two lines to the one now being operated by the company. It would extend the 40-minute loop service from Morgan Square, Beaumont and Drayton and another loop from Morgan Square and South Converse and Union Street. The ordinance also provides that the company, at its own cost, co-operate with the city's paving plan. It is stipulated that if at any time the bus service fails to take care of the transportation situation the amendment becomes null and void and the company must re-lay the track and institute a trolley service.

The ordinance does not contemplate the suspension of operation of street cars to Glendale and Clifton. It is not the intention of the City Council to place before the people of Spartanburg the question whether street cars shall be operated outside the city limits. Luther K. Brice, Commissioner, stated that the street cars now operating to out-of-town points would not be affected by the outcome of the election. The action of the City Council is the direct outgrowth of action recently taken by the local Chamber of Commerce, which held that in view of the proposed $1,000,000 bond issue for municipal improvements, the people should decide whether they want trolleys or buses.

Traffic Survey in Washington

McClellan & Junkersfeld, Inc., New York, are to make a survey of transportation conditions in Washington, D. C., under the supervision of the Public Utilities Commission. The expense is to be borne by the North American Company, New York, which is represented as having a "substantial investment in transportation systems in the District."

According to Major W. E. R. Covell, who represented the commission in arranging for the survey, the forthcoming inquiry into transportation conditions as they now exist is probably the most constructive step ever taken toward a merger of the Washington Railway & Electric Company and the Capital Traction Company. He said, however, that the North American Company is neither for nor against a merger at this time. The company, Major Covell said, is frankly interested and desires to have the facts impartially determined so that it can base its future actions thereon.

The actual work of the survey will be in charge of F. W. Doolittle, vice-president of the engineering firm. He formerly had been connected with the Wisconsin Railway Commission, the Illinois Utility Commission, and was at one time director of the research bureau of the American Electric Railway Association.

The letter of Edwin Gruhl, vice-president and general manager of the North American Company, to the Public Utilities Commission, follows:

Gentlemen: This will review our conferences concerning a transportation survey of the District of Columbia and record our understanding with respect to the following matters:

1. The Public Utilities Commission has found that a thorough study of the transportation situation in the District of Columbia is essential in order to procure ultimately for the District the best and most economical transportation service by co-ordination of existing facilities and the adoption of additional transportation agencies.

2. The North American Company at present has a substantial investment in transportation systems in the District, and accordingly is interested in a solution of the existing problem. As a result of a preliminary investigation, the North American Company has reached the conclusion that a thorough study of the present transportation situation is essential.

3. Because of this mutual interest the North American Company agrees to have made through McClellan & Junkersfeld, Inc., engineers, at a cost not to exceed $50,000, a fact-finding survey under the regulation and supervision of the commission. The results of this survey shall be reported to the commission and shall be available to the street railway companies operating in the District, to the North American Company, and otherwise, as the commission may direct.

4. Attached hereto, marked "Annex A," is an outline of data to be assembled, which is understood to represent the general scope of the survey proposed to be made.

5. This survey will be undertaken at the earliest practicable date and will be carried out as rapidly as may be consistent with the securing of the necessary basic data, including data presently available in the files of the commission.

6. In addition to providing the services of McClellan & Junkersfeld, Inc., for this survey, the North American Company will defray any extra expenses incurred by the commission in supervising this survey.

The cost of carrying out the work incident to conducting the survey is estimated at $50,000.

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Recent Bus Developments

Yonkers Railroad Competitor for Bus Rights—Delaware Company Takes Over Buses—Many Other Items of Interest

THE right to operate twelve bus routes totaling 86 miles in Yonkers, N. Y., was granted to the Westchester County Bus System, Inc., on April 22. In its plea for the right to run the company was successful over several competitors, among them the Third Avenue Railway System, New York City. The bus matter is said to have been brought to a head by the Yonkers Street Railroad, affiliated with the Third Avenue Railway, announcing that on May 12 it proposed to abandon five non-paying lines. Consent to do this was obtained from the Public Service Commission. The matter has been before the Council for ten months. Finis has not yet been written to it, first, because the Yonkers Street Railroad has announced its intention to carry the matter into the courts if necessary to prevent unfair competition with its lines, and, second, because Mayor Weisendanger has not yet passed upon the ordinance, against which sufficient Aldermen are opposed to defeat the matter if it should come up again for vote for passage over a veto. The expenditure for the proposed bus system is estimated at $615,700. Back of the new system as its operating head is A. E. Hutt, vice-president and general manager. Mr. Hutt has in the past been connected with the Detroit Motor Bus Company, the Philadelphia Rapid Transit Company and the Fifth Avenue Coach Company, New York.

T. W. Wilson, vice-president and general manager of the Wilmington & Philadelphia Traction Company, recently confirmed the rumor that a company which will be associated with the local traction system had arranged to purchase the Stiltz Brothers, Newark-Wilmington bus line. He stated that the new company which will take over this line expects to improve the present equipment and gradually make replacements with modern buses. Buses will operate on as frequent a schedule as business warrants and the rate of fare from Wilmington to Newark will remain the same as at present charged by Stiltz Brothers. Mr. Wilson said that his company has for some time been operating its trolley lines in Chester in association with the Southern Pennsylvania Bus Company, owned by the same interests as control the traction company. This bus line by special arrangement has established a system of transfer exchanges between the bus lines and the street cars which has proved satisfactory. It is the intention of the local traction company and the new bus company to work out a similar scheme of exchange tickets in Wilmington.

The Union Street Railway will establish a bus line between New Bedford, Mass., and Providence, R. I., with arrangements to supply service between New Bedford and Fall River. Elton S. Wilde, vice-president and general manager of the company, said that his company would file petitions immediately for bus licenses not only in New Bedford but in the surrounding towns and cities as well. Terminals will be established in New Bedford, Fall River and Providence.

The Iowa Southern Utilities Company, Centerville, Iowa, will substitute buses for its railway cars over the Centerville system. It has received a full complement of motor cars for the service, operating from South Centerville to railroad stations and the uptown business district. The company has substituted five buses on its West End and Bluff Road routes in Burlington for trolley cars.

Fares on the bus lines of the Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, were to be increased May 1, C. M. Cheney, president and general manager, announced recently, as the result of the action of the Iowa Legislature doubling the carrier tax on buses. The Waterloo-Cedar Falls fare, which was 15 cents, or ten tickets for $1.20, will be raised to 20 cents, or ten tickets for $1.50, and 5 cents has been added to the Waterloo-Cedar Heights tariff. The carrier tax on the route under the old statute ranged from $250 to $300 a month and will be twice that now. Two new buses have been added to the line, making a fleet of nine.

Bus fares on the former J-H lines to Franklin, Columbus and Seymour, Ind., from Indianapolis have been increased by the Interstate Public Service Company, which recently obtained control of the J-H system. Officials of the railway said rates had been restored to the original figures that prevailed when the line was established by A. G. Harmon in competition with the Interstate Public Service. The lowest fares were the result of a price-cutting war between the traction and bus companies. The rate to Franklin remains the same, but from Franklin to Columbus a 10-cent increase is made and from Columbus to Seymour a 20-cent increase.

The Olean, Bradford & Salamanca Railway has been granted a franchise by the Common Council of Salamanca, N. Y., to operate buses over eight streets in the city. By this decision the Council reverses its previous order when it refused the franchise. A number of changes were made in the proposed terms, principally that the duration will be ten years instead of fifteen and that the company will apply to the Public Service Commission in fifteen days for permission to operate buses, and if so permitted to run them over the eight streets within 60 days thereafter. The company also proposes to run bus lines between Salamanca and Little Valley and into the Alleghany State Park in connection with service in Salamanca. It has received permission to abandon its railway between Salamanca and Little Valley.

Mayor Curley of Boston, Mass., has taken the stand that the Boston Elevated Railway, as well as other established lines of transportation, should be protected against destructive competition from new lines of buses. He reiterated this position a few days ago when he approved eight petitions from the Boston Elevated for authority to operate buses in Boston and rejected several petitions which would have created competition with the railroads.

It is said that a petition is being circulated in High Point, N. C., calling for bus line additions to the street car service or bus lines as substitutes for the street cars. Henry Jennings, local manager for the North Carolina Public Service Company at High Point, said that the concern was ready to give the people what they wanted. The company is operating bus lines at Greensboro and Mr. Jennings said that their operation had been satisfactory.

The Ottawa Electric Railway, Ottawa, Ont., has received a license to operate buses to the Notre Dame Cemetery on the Montreal Road. The buses will run between the Notre Dame Cemetery and the corner of Rideau and Charlotte Streets, passing through the town of Eastview. A special Sunday service will be provided during the summer months. The fare for Sundays and weekdays will be 5 cents cash or ten tickets for 25 cents.

At a recent meeting of citizens of South Jacksonville, Ill., and officers of the Jacksonville division of the Illinois Power & Light Company the company proposed the substitution of bus service for trolleys in South Jacksonville. The plan is to remove all tracks south of Michigan Avenue to Nichols Park.

Uniform rules for the operation of buses in Massachusetts are being adopted by the Department of Public Utilities. Their origin lies with the Board of Selectmen, or Aldermen, in the various towns and cities, but they are made subject to approval by the State Department. The latest rules approved are for the town of Greenfield, which were adopted by the Selectmen and then changed by the State Department of Public Utilities, on the petition of residents of Greenfield, to conform to the basic principles laid down by the department some time ago for the city of Taunton and modified to meet later developments.

The Eastern Massachusetts Street Railway has obtained a license from the City Council in Cambridge, Mass., to operate buses in that city, on the condition that it will not pick up local passengers in the territory served by the Boston Elevated Railway. It is to take on passengers for points outside of Cambridge, on their way to Lowell. This is a part of the controversy which the Eastern Masschusetts has with the Boston & Maine Railroad over service between Boston and Lowell. The issue is not yet settled either in Lowell or in Woburn, where public hearings have been held. The Lowell City Council has decided to confer with Governor Fuller before deciding the issue.

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New York State Interurban Rates Advanced

The Public Service Commission has granted permission to the New York State Railways to increase the commutation rates on its Rochester & Eastern and Rochester & Sodus divisions. The order provides that the company may revise its prices for 54-trip commutation books and for 46-trip school ticket books on a graduated basis, starting at 2 cents a mile.

The new schedules will remain in effect one year. The evidence showed a net loss of $72,174 for the twelve months ended Oct. 31, 1924, for the Rochester & Eastern and a loss of $93,364 for a similar period on the Sodus route. These facts influenced the commission to grant the increase. Under the proposed tariff the estimated increase in passenger revenue for one year will be $18,610 on the Rochester & Eastern and $10,410 on the Rochester & Sodus lines. School and college students and Rochester commuters will be most greatly affected.

News Notes

Revaluation Bill Tabled.—The Pennsylvania House of Representatives recently tabled the Schantz bill, fostered by Governor Pinchot, which provided an appropriation of $100,000 to the Public Service Commission to defray the expenses of a revaluation of the Philadelphia Rapid Transit Company. The Governor in appealing to the House said that the matter of a "reasonable rate of fare for Philadelphia" depended on the fate of the bill.

New Fare Rates Announced. — The Pittsburgh Railways, Pittsburgh, Pa., started on May 1 a number of additional privileges with regard to fares which have been approved by the Traction Conference Board. These include 10-cent round trip fares without transfers, and 5-cent fares with and without transfers. In honor of National Electric Railway Day, Tuesday, May 5, the company will make available the 25-cent and the 40-cent passes hitherto issued only on Sunday.

Peace in Albany.—After a deadlock over trolley fares between the city of Albany and the United Traction Company, differences have just been settled. The company agrees to withdraw its application to the Public Service Commission for a 10-cent fare. The city will withdraw its petition for a 5-cent fare. The city will give the Capitol District Transportation Company, a subsidiary of the United Traction, a franchise for operation of bus lines in several sections, and the traction company will grant to the city 33 ft. of roadway it owns. The truce is to continue until Jan. 1, 1926. The traction company announces that 42 new buses will be ordered at once.

Counsel Explains Valuation Procedure. — A. A. Stewart, corporation counsel, has filed an answer to the appeal of the St. Paul City Railway and the Minnesota Railroad and Warehouse Commission from the order of Judge R. D. O'Brien of the District Court that the company and the commission filed certified copies with the court of the proceedings in the valuation of the railway properties. He contends that the order is not appealable and that should the Supreme Court uphold the company it would establish a dangerous precedent and recognize its right to determine the jurisdiction of the court in the matter. In other words, that it would remove the control from the commission into the courts. The brief holds that the proper procedure would be for the commission to file a report and then ask the court to determine whether it had jurisdiction. If the commission's report is held subject to review by the court it would go on trial and the court would determine the true value of the railway properties, the corporation counsel submitted in his statement.

Fares Increased. — Fares in Fort Madison, Iowa, were raised to 7 cents, with four tickets for 25 cents, on April 26 by the Fort Madison Street Railway. The Fort Madison system had been operating at a 5-cent fare. President Schulze pointed out that 68 per cent of the operating cost went into wages and the company refused to increase its operating income by reduction of wages. The property is appraised at $225,000 and has failed to make an adequate return on that basis.

Present Fare Continued Pending Baltimore Valuation—The Public Service Commission of Maryland on April 15 extended the present 7½-cent fare of the United Railways & Electric Company until the valuation proceedings are concluded. The original order of the commission fixing the present fare became effective on May 31, 1924, and was to continue till April 30, 1925, unless extended by order of the commission or automatically extended because the valuation proceedings were in progress. As the valuation case will not begin until May 4 next, the commission ordered the extension.

Municipal Line to Use One-Man Cars. — The Kitchener Light Commission, Kitchener, Ont., in March made a profit of only $5.44 on the local street railway. As a result, Manager V. S. McIntyre, on the recommendation of the commissioners, is looking into the question of changing the Peter Witt cars on the Kitchener and Waterloo line into one-man affairs. The idea is to have them so constructed, if possible, that they may be operated as now by two men in the rush period.

Suggest Traffic Relief. — The Public Utilities Bureau, Louisville, Ky., has recommended to the city that all automobile parking on Fourth Street, between Main and Broadway, a distance of about eight blocks, be abolished to clear traffic congestion. At the present time there are regulations in effect which prevent parking during the peak traffic periods. The Board of Safety has been told that either parking should be eliminated, or Fourth Street made a one-way thoroughfare. Charles Roser, auditor of the Utilities Bureau, suggests that all parking be eliminated, making it possible for two streams of traffic to move each way on Fourth Street, and for autos to pass moving street cars.

Safety Course to Conclude.—The Safety Drivers' Club of the Western Pennsylvania Safety Council has been conducting a safety course for drivers in the auditorium of the Chamber of Commerce of Pittsburgh. The series of meetings, which ended on April 29, included talks by prominent speakers on the subject of traffic and safety as well as round-table discussion, singing and motion pictures bringing the lessons of safety home more forcibly. W. H. Boyce, commercial manager of the Pittsburgh Railways, is vice-president of the Safety Drivers' Club.

City Aids Railway.—The city of Findlay, Ohio, recently filed with the State Public Utilities Commission a resolution of the City Council, protesting against the commission's granting to any bus company a certificate to operate between the cities of Findlay and Toledo. The protest states that the Toledo, Bowling Green & Southern Traction Company is furnishing adequate service, and that if it is required to meet bus competition the railway line will be forced to suspend operations.

Jitney Business Remains Unchanged. —Since the passage of the new traffic ordinance in Terre Haute, Ind., restricting their operation, several operators of jitneys have quit the business, but just as quickly as their rights were surrendered others took them up. In this manner the number of jitneys in the city is practically the same as it was when the ordinance was signed. The only additional licenses which cover vehicles carrying passengers for hire are those issued to the Terre Haute, Indianapolis & Eastern Traction Company. For buses such as those operated by the traction company a license fee of $50 a year is paid, while the jitneys are charged at the rate of $25 a year. Figures at the office of the City Comptroller show 110 jitneys, taxis and buses in operation in Terre Haute at the present time. This is said to be practically the same number operating a year ago with the exception that buses of the traction company are now among those run.

Bus Ordinance Upheld.—In an appeal from the decision of Judge H. J. Grannis of the District Court, the Minnesota Supreme Court has upheld the ordinance passed by the voters in Duluth, Minn., on June 23, 1924, in the case of Carl H. Schultz, representing the Duluth Bus Association, with the Duluth Street Railway as intervenor. An injunction against enforcement of the ordinance was denied July 15, 1924. The ordinance prohibited intracity buses from operating on streets with double trolley tracks. The suit claimed the ordinance was discriminatory and in favor of the railway. The ordinance did not affect intercity buses. The court held that public welfare and safety demanded buses of the sort to be so limited as not to become a nuisance or a menace, and that the ordinance was enacted for this purpose and was not beyond the police powers of the city. Further, that where there were double trolley tracks there was no need for intracity buses, to say nothing of the danger and inconvenience of several competing buses.

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Financial and Corporate

Denver Reorganization Ratified

Annual Interest Charge to Be Cut from $953,015 to $580,848—$4,000,000 Spent for Improvements

The protective committees for security holders of the Denver Tramway and of the holding company, the Denver & Northwestern Railway, Denver, Col., have adopted a plan of reorganization. The system has been operated by Ernest Stenger as receiver since Dec. 24, 1920. A joint reorganization committee has been named consisting of Claude K. Boettcher and Samuel M. Perry, Denver, and George C. Clark, Jr., New York, to execute the plan and call for deposit of securities.

The reorganization plan provides for the termination of the receivership and the organization of a new company to take over the property. It provides for the reduction of the funded debt of $17,541,700 to .$11,078,350, and for the adjustment of the preferred stock of $3,953,337. Annual interest charges will be reduced from $953,015 to $580,848. The capitalization of the new company will consist of $4,635,000 of underlying bonds which will not be disturbed, $6,443,350 of new 5 per cent mortgage bonds, $10,318,145 of new 7 per cent preferred stock, and 6,250 shares of common stock without par value.

Holders of the Denver City Tramway first and refunding sinking fund mortgage 5 per cent bonds and of the Denver & Northwestern first and collateral mortgage 5 per cent bonds will be entitled to receive $500 in new 5 per cent mortgage bonds, and $758.33 for each $1,000 of principal of their bonds.

Holders of the Denver Tramway three-year 7 per cent collateral trust notes will be entitled to receive $500 in new 5 per cent mortgage bonds, and $732.69 in new preferred stock for each $1,000 of their notes. Stockholders of the Denver & Northwestern Railway, who pay assessment of $10 a share, will receive $10 par value of new preferred stock and one share of new common stock. Stockholders of the Denver Tramway upon paying an assessment of $6 a share will receive $6 par value of new preferred stock and three-fifths of a share of the new common stock.

It was stated on behalf of the committee that more than $4,000,000 has been spent by the receiver in putting the property in first class operating condition.

Income Balance in Tacoma $39,841

The Tacoma Railway & Power Company, Tacoma, Wash., during the year 1924 carried 25,499,946 revenue passengers and 2,719,718 free transfer passengers. More than 1,116,543 employees and others rode free. Total revenue from transportation was $1,427,647 and the average fare per passenger, including transfers, was 5.023 cents. Other operating revenues were $58,890, making total operating revenue $1,486,538, a gain of $81,311 over 1923. Total operating expense was $1,246,732, a decrease of $53,782 from the previous year, leaving net operating revenues of $221,805. Adding auxiliary operations, and deducting rent and taxes, the operating income was $116,892, a decrease of $34,096. After the further reduction of rent and taxes and other property charges, there was an income balance of $39,841 to be transferred to profit and loss account. This sum was $33,368 less than for the previous year.

The total investment of the Tacoma Railway & Power Company in road and equipment is given at $6,232,210. There is an unmatured funded debt of $5,544,000 and long-term open accounts of $95,000. The report shows that, deducting total liabilities from assets, $202,699 remained as a total corporate surplus credit.

Large Companies Made Best Showing in 1924

Returns from 370 Companies, Divided as to Annual Earnings and Character of Operations, Show that Larger Companies, Especially Those Operating Both City and Interurban Lines, Made Best Showing

FOR the electric railway industry the year 1924 began auspiciously. The first three months the traffic was at the high-water. Then the general business slump made itself felt and traffic was continuously below normal until the late fall, when, with the sudden recovery of general business, it rebounded too and closed the year on the crest of a wave.

Edmund J. Murphy, chief statistician of the American Electric Railway Association, writing in *Aera* for May, says that the outstanding fact brought out by the segregation of companies according to size is that the small organizations, those serving cities and towns under say 50,000 population, are having a hard time. In the larger cities and more densely settled communities the automobile has reduced the rate of increase in riding. As diagnostician of the symptoms manifested in this remarkable annual study, this year showing the operating results of 370 companies, Mr. Murphy says it behooves the railways to make careful studies of their traffic with the idea of trying to adjust the physical layout of their lines and their service more and more closely to the traffic demands of their communities.

As for the figures of operation for the year, a recapitulation of them shows that electric railway traffic in 1924 was approximately 1 per cent less than in 1923. A group of 370 companies reports a total of 13,483,075,342 passengers in 1924 compared with 13,642,989,110 passengers in 1923. These figures include the companies in New York City. If the New York companies are excluded the figures become 11,410,795,999 in 1924 and 11,674,013,336 in 1923, a decrease of 2.26 per cent. Traffic in New York increased from 2,756,463,910 to 2,854,574,555, or about 3.55 per cent.

The railway operating revenues of the group of 370 companies, including New York, were $786,530,422 in 1924 and $794,252,546 in 1923, a decrease of 0.98 per cent. Operating expenses also decreased 0.58 per cent and this tended in some degree to offset the loss of traffic. The operating ratio in 1924 was 73.90 per cent, compared with 73.61 per cent in 1923.

A summary of these figures is presented in the following table:

COMBINED OPERATIONS OF 370 COMPANIES

	1924	1923	Per Cent Increase or Decrease
Operating revenue	$786,530,422	$794,252,546	*0.98*
Operating expense	581,288,567	584,674,342	*0.68*
Net operating revenue	205,241,855	209,578,204	*2.07*
Operating ratio	73.90%	73.61%	0.39
Miles of track	32,083.3	32,032.5	0.15
Revenue passengers	10,890,887,334	10,906,853,081	*0.15*
Total passengers	13,483,075,342	13,642,989,110	*1.18*
Car-miles (rev.)	1,843,827,779	1,823,941,852	1.09

Figures in *italic* show decrease.

The companies included in this statement operate about 75 per cent of the total track and account for nearly 85 per cent of the gross revenues of the industry.

Mr. Murphy says that in considering the effect of business depression on electric railway traffic, therefore, some allowance should be made for this factor of competition. It is his idea that it is almost impossible to estimate its magnitude, but whatever it is, it would reduce just so much the effect of business depression indicated in the above mentioned table, since the loss in electric railway traffic shown there includes whatever losses are due to bus competition.

Reports from 261 companies that gave complete statements are summarized in the tables accompanying this article. These companies operate some 25,000 miles of track or almost 60 per cent of the total for the industry. About 40 per cent of this track is city track, 36 per cent interurban and 24 per cent combination city and interurban; that is, it is operated by companies doing both a city and an interurban business.

The operations of this group in 1924 follow very closely the trend of the

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Statistics Compiled by American Electric Railway Association

TABLE I—COMBINED INCOME STATEMENT OF 261 RAILWAYS

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$536,059,372	$545,975,086	(D) $9,915,714	(D) 1.82
Railway operating expense	405,426,764	409,751,971	(D) 4,325,207	(D) 1.06
Net operating revenue	$130,632,608	$136,223,115	(D) 5,590,507	(D) 4.10
Net revenue: Auxiliary operations	13,427,623	12,371,940	1,055,683	8.53
Taxes	36,432,539	37,255,887	(D) 823,348	(D) 2.20
Operating income	$107,627,692	$111,339,168	(D) 3,711,476	(D) 3.33
Non-operating income	9,373,148	9,371,738	1,410	.02
Gross income	a$117,059,720	b$120,780,003	(D) 3,720,283	(D) 3.08
Deductions from gross income	97,954,384	95,263,337	2,691,047	2.92
Net income	$19,105,336	$25,516,666	(D) 6,411,330	(D) 25.13
Operating ratio (per cent)	75.63	75.05	.58	.77
Ratio: Net income to operating revenue	3.56	4.67	(D) 1.11	(D) 23.77

a Includes $58,880 equalization income. *b* Includes $69,097 equalization income.

TABLE II—COMBINED INCOME STATEMENT (ON A CAR-MILE BASIS) OF 261 RAILWAYS

	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Railway operating revenue	45.39	46.36	(D) 2.09
Railway operating expense	34.33	34.79	(D) 1.32
Net operating revenue	11.06	11.57	(D) 4.41
Net revenue: Auxiliary operations	1.14	1.05	8.57
Taxes	3.09	3.16	(D) 2.21
Operating income	9.11	9.46	(D) 3.70
Non-operating income	.80	.79	1.26
Gross income	9.91	10.25	(D) 3.32
Deductions from gross income	8.29	8.09	2.47
Net income	1.62	2.16	(D) 25.00

TABLE III—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 261 RAILWAYS

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$59,633,070	$62,232,967	(D) $2,599,897	(D) 4.18
Equipment	50,806,101	50,053,439	752,662	1.50
Power	57,068,262	61,809,892	(D) 4,741,630	(D) 7.67
Conducting transportation	172,253,557	170,261,073	1,992,484	1.17
Traffic	1,777,213	1,614,910	162,303	10.05
General and miscellaneous	58,605,725	58,672,170	(D) 66,445	(D) 1.13
Transportation for investment—Cr.	—228,722	—192,360	36,362	18.90
Total operating expense	a$405,426,766	b$409,751,965	(D) 4,325,199	(D) 1.06

a Includes $5,211,560 undistributed expense. *b* Includes $5,299,873 undistributed expense.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM ACCOUNTS OF 261 RAILWAYS

	1924	1923	Per Cent Increase or (D) Decrease
Railway operating revenue	$536,059,372	$545,975,086	(D) 1.82
Per mile of single track	21,677	22,117	(D) 1.99
Gross income	$117,059,720	$120,780,003	(D) 3.09
Per mile of single track	4,733	4,886	(D) 3.14
Passenger revenue	$504,191,727	$512,961,939	(D) 1.71
Per revenue passenger	17.0c	17.1c	(D) 1.41
Per total passenger	15.6c	15.6c	.....
Per mile of single track	[2]$20,388	[3]$20,695	(D) 1.49
Per passenger car-mile	[2]43.7c	[2]44.6c	(D) 2.02
Per car operated	[3]16,418	[3]16,888	(D) 2.79
Per passenger car-hour	44.06	44.14	(D) 1.94
Revenue passengers	[5]7,093,827,117	[5]7,185,734,125	(D) 1.28
Per mile of single track	[5]297,047	[5]301,134	(D) 1.36
Per passenger car-mile	[6]6.2	[6]6.3	(D) 1.58
Per car operated	[6]240,316	[6]245,459	(D) 2.10
Per passenger car-hour	761	761	.....
Total passengers	[8]8,886,095,509	[9]9,044,022,386	(D) 1.75
Per mile of single track	[5]372,097	[5]379,009	(D) 1.83
Per passenger car-mile	[5]7.8	[8]8.0	(D) 2.50
Ratio: Transfer passengers to revenue passengers (per cent)	24.2%	24.8%	(D) 2.42
Revenue car miles	1,180,828,184	1,177,772,172	0.25
Per mile of single track	47,750	47,710	0.08
Per car operated	[3]37,797	[3]38,030	(D) 0.62
Per car-hour	49.29	49.27	0.21
Car-hours	[4]117,030,865	[4]116,961,279	0.21
Per car operated	[9]4,061	[9]4,064	(D) 0.08

[1] 256 companies. [2] 261 companies. [3] 217 companies. [4] 230 companies. [5] 255 companies. [6] 211 companies. [7] 224 companies. [8] 210 companies. [9] 200 companies.

TABLE V—OPERATING EXPENSES (PER CAR-MILE) OF 261 RAILWAYS

	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Way and structures	5.05	5.28	(D) 4.73
Equipment	4.30	4.25	1.17
Power	4.83	5.25	(D) 8.00
Conducting transportation	14.59	14.46	.89
Traffic	.15	.13	15.38
General and miscellaneous	4.96	4.98	(D) .40
Transportation for investment—Cr.	.02	.02	.....
Total operating expenses	a34.33	b34.79	(D) 1.32

a Includes 0.46 cent of undistributed expense. *b* Includes 0.45 cent of undistributed expense.

TABLE VI—OPERATING STATISTICS OF 261 RAILWAYS

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	1,149,789,200	1,148,164,918	1,624,282	.14
Total revenue car-miles	1,180,828,184	1,177,772,172	3,056,012	.26
Revenue passengers[1]	7,098,827,117	7,185,734,125	(D) 91,007,008	(D) 1.28
Transfer passengers[2]	1,719,962,687	1,782,071,055	(D) 62,108,368	(D) 3.49
Total passengers[4]	8,886,095,509	9,044,022,386	(D) 157,926,877	(D) 1.75
Passenger revenue	$504,191,727	$512,961,939	(D) 8,770,212	(D) 1.71
Revenue car-hours[3]	117,030,865	116,961,279	69,586	.06
Passenger car-hours[3]	115,508,947	115,490,586	18,361	.02
Miles of single track	24,728.9	24,685.6	43.3	.18
Cars operated[4] *a*	27,629	27,365	264	.96

a Average maximum number of cars in service daily. [1] Reported by 255 companies. [2] Reported by 178 companies. [3] Reported by 230 companies. [4] Reported by 214 companies.

TABLE VII—COMBINED INCOME STATEMENT OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$349,247,964	$350,874,322	(D) $1,626,358	(D) .46
Railway operating expense	257,388,946	256,964,877	424,069	.17
Net operating revenue	$91,859,018	$93,909,445	(D) 2,050,427	(D) 2.18
Net revenue: Auxiliary operations	3,367,854	3,331,965	35,889	1.07
Taxes	24,044,781	24,354,592	309,811	1.27
Operating income	$71,182,091	$72,886,818	(D) 1,704,727	(D) 2.33
Non-operating income	5,162,204	5,190,904	(D) 28,700	(D) .55
Gross income	a$76,403,175	b$78,146,819	(D) 1,743,644	(D) 2.23
Deductions from gross income	60,733,259	58,675,219	2,058,040	3.50
Net income	$15,669,916	$19,471,600	(D) 3,801,684	(D) 19.51
Operating ratio (per cent.)	73.70	73.23	.47	.64
Ratio: Net income to operating revenue	4.49	5.55	(D) 1.06	(D) 19.10

a Includes $58,880 equalization income. *b* Includes $69,097 equalization income.

TABLE VIII—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$35,065,896	$36,797,154	(D) $1,731,258	(D) 4.70
Equipment	32,790,468	31,352,968	1,437,500	4.58
Power	33,682,729	36,450,146	(D) 2,767,417	(D) 7.59
Conducting transportation	115,705,847	113,234,028	2,471,819	2.18
Traffic	628,979	493,609	135,370	27.42
General and miscellaneous	35,165,637	34,587,227	578,410	1.67
Transportation for investment—Cr.	—174,184	—138,929	35,255	25.37
Total operating expense	a$257,388,946	b$256,964,877	424,069	.16

a Includes $4,523,573 undistributed expense. *b* Includes $4,188,673 undistributed expense.

TABLE IX—OPERATING STATISTICS OF 93 COMPANIES OPERATING CITY LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	745,396,139	745,011,162	384,977	.05
Total revenue car-miles	747,767,250	747,501,171	266,079	.03
Revenue passengers[1]	5,218,486,238	5,348,283,037	(D) 129,796,799	(D) 2.43
Transfer passengers[2]	1,485,851,328	1,499,527,955	(D) 13,676,632	(D) .91
Total passengers[3]	6,749,384,004	6,897,294,982	(D) 147,910,978	(D) 2.14
Passenger revenue	$340,688,213	$342,007,362	(D) $1,319,149	(D) .38
Revenue car-hours[3]	79,221,419	78,993,517	227,902	.29
Passenger car-hours[3]	78,999,684	78,743,232	256,452	.33
Miles of single track	9,837.4	9,818.5	18.9	.19
Cars operated[4] *a*	18,804	18,835	(D) 31	.16

a Average maximum number of cars in service daily. [1] Reported by 91 companies. [2] Reported by 78 companies. [3] Reported by 90 companies. [4] Reported by 84 companies.

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TABLE X—INCOME STATEMENT OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$95,267,622	$101,063,931	(D) $5,796,309	(D) 5.7
Railway operating expense	78,316,953	80,495,296	(D) 2,178,343	(D) 2.71
Net operating revenue	$16,950,669	$20,568,635	(D) 3,617,966	(D) 17.58
Net revenue: Auxiliary operations	5,611,603	4,994,352	617,251	1.23
Taxes	5,883,625	6,152,290	(D) 268,665	(D) 4.37
Operating income	$16,678,647	$19,410,697	(D) 2,732,050	(D) 14.07
Non-operating income	1,732,105	1,599,620	132,485	8.28
Gross income	$18,410,752	$21,010,317	(D) 2,599,565	(D) 12.37
Deductions from gross income	18,447,211	18,195,278	251,933	1.38
Net income	*$36,459	$2,815,039	(D) 2,851,498	(D) 101.27
Operating ratio (per cent)	82.21	79.65	2.56	3.21
Ratio: Net income to operating revenue	*.38	2.78	(D) 3.16	(D) 113.66

*Deficit.

TABLE XI—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$14,298,619	$14,209,359	$89,260	.63
Equipment	9,485,938	9,744,305	(D) 258,367	(D) 2.65
Power	12,561,728	13,712,347	(D) 1,150,619	(D) 8.39
Conducting transportation	28,667,944	29,068,499	(D) 400,555	(D) 1.38
Traffic	663,122	671,425	(D) 8,303	(D) 1.24
General and miscellaneous	12,472,997	12,937,519	(D) 464,522	(D) 3.59
Transportation for investment—Cr.	—21,324	—15,066	6,258	41.53
Total operating expense	*a*$78,316,955	*b*$80,495,290	(D) 2,178,335	(D) 2.71

a Includes $187,931 undistributed expense. *b* Includes $166,902 undistributed expense.

TABLE XII—OPERATING STATISTICS OF 111 RAILWAYS OPERATING INTERURBAN LINES EXCLUSIVELY

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	200,335,929	202,483,275	(D) 2,147,346	(D) 1.06
Total revenue car-miles	221,392,024	222,435,459	(D) 1,043,435	(D) .46
Revenue passengers[1]	798,675,510	850,111,921	(D) 51,436,411	(D) 6.05
Transfer passengers[2]	138,529,672	140,303,996	(D) 1,774,324	(D) 1.26
Total passengers[1]	942,840,718	996,073,786	(D) 53,233,068	(D) 5.34
Passenger revenue	$78,694,254	$83,741,008	(D) $5,046,754	(D) 6.03
Revenue car-hours[3]	17,538,703	17,806,295	(D) 267,592	(D) 1.50
Passenger car-hours[3]	16,559,006	16,883,604	(D) 224,598	(D) 1.33
Miles of single track	8,984.3	8,929.9	54.4	.61
Cars operated[4]*a*	4,304	4,144	160	3.86

a Average maximum number of cars in service daily. [1] Reported by 109 companies. [2] Reported by 54 companies. [3] Reported by 90 companies. [4] Reported by 86 companies.

TABLE XIII—INCOME STATEMENT OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue	$91,543,786	$94,036,833	(D) $2,493,047	(D) 2.65
Railway operating expense	69,720,865	72,291,798	(D) 2,570,933	(D) 3.56
Net operating revenue	$21,822,921	$21,745,035	77,886	.35
Net revenue: Auxiliary operations	4,448,166	4,045,623	402,543	.99
Taxes	6,504,133	6,749,005	(D) 244,872	(D) 3.63
Operating income	$19,766,954	$19,041,653	725,301	3.81
Non-operating income	2,478,839	2,581,214	(D) 102,375	(D) 3.96
Gross income	$22,245,793	$21,622,867	622,926	2.88
Deductions from gross income	18,773,914	18,392,840	381,074	2.07
Net income	$3,471,879	$3,230,027	$241,852	7.49
Operating ratio (per cent)	76.16	76.88	(D) .72	(D) .94
Ratio: Net income to operating revenue	3.79	3.43	.36	10.49

TABLE XIV—OPERATING EXPENSES (BY PRIMARY ACCOUNTS) OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures	$10,268,555	$11,226,454	(D) $957,899	(D) 8.53
Equipment	8,529,695	8,956,166	(D) 426,471	(D) 4.76
Power	10,823,805	11,647,399	(D) 823,594	(D) 7.07
Conducting transportation	27,879,766	27,958,546	(D) 78,780	(D) .28
Traffic	485,112	449,876	35,236	7.83
General and miscellaneous	10,967,091	11,147,424	(D) 180,333	(D) 1.61
Transportation for investment—Cr.	—33,214	—38,365	(D) 5,151	(D) 13.42
Total operating expense	*a*$69,720,865	*b*$72,291,798	(D) $2,570,933	(D) 3.55

a Includes $800,055 undistributed expense. *b* Includes $944,289 undistributed expense.

TABLE XV—OPERATING STATISTICS OF 57 COMBINED CITY AND INTERURBAN LINES

	1924	1923	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles	204,057,142	200,670,481	3,386,661	1.69
Total revenue car-miles	211,668,910	207,835,542	3,833,368	1.84
Revenue passengers[1]	1,076,665,369	987,339,167	89,326,202	9.0
Transfer passengers[2]	95,581,687	142,239,104	(D) 46,657,417	(D) 3.28
Total passengers[1]	1,193,870,787	1,150,653,618	43,217,169	3.76
Passenger revenue	$84,809,260	$87,213,569	(D) $2,404,309	(D) 2.75
Revenue car-hours[3]	20,270,743	20,161,467	109,276	.54
Passenger car-hours[3]	19,950,257	19,863,750	86,507	.44
Miles of single track	5,907.2	5,937.2	(D) 30.0	(D) .48
Cars operated[4]*a*	4,521	4,386	135	3.07

a Average maximum number of cars in service daily. [1] Reported by 55 companies. [2] Reported by 46 companies. [3] Reported by 50 companies. [4] Reported by 44 companies.

larger group. The total number of passengers carried was 8,886,095,509, as compared with 9,044,022,386 in 1923, a decrease of 1.75 per cent. Operating revenue dropped 1.82 per cent from $545,975,086 to $536,059,372, or a loss in revenue of $9,915,714. A drop in operating expenses of nearly 1 per cent, however, made the decrease in net revenue only $5,590,507. There was, therefore, a slight increase in the operating ratio from 75.05 per cent to 75.63 per cent.

An increase of more than $1,000,000 in the net revenue from auxiliary operations, together with a decrease of $823,348 in taxes, further reduced the loss, so that the gross income available to meet fixed charges was only $3,720,283 less than in 1923. Fixed charges, however, increased $2,691,047, or 2.92 per cent, and the final net income was $6,411,330 under 1923. The respective amounts were $19,105,336 in 1924 and $25,516,666 in 1923, or a decrease of 25 per cent.

These net incomes were 3.56 per cent of the operating revenue in 1924 and 4.67 per cent in 1923.

The outstanding features of this statement are undoubtedly the drop in the operating revenue and the indication that operating costs are becoming stabilized. The latter is even more significant than the former, for the loss in revenue was due to a temporary slump in business, which already is by way of being forgotten, while the stabilizing of costs promises to continue to be a source of strength to the industry in the future. What change there was in cost of operation was downward. By reason of it this group of companies was able to furnish more service in 1924 than in 1923 with an expenditure of $4,325,207 less. They operated over 3,000,000 more car-miles and still reduced operating expenses more than 1 per cent.

As already stated, this group of companies is made up of city lines, interurban lines and combination city and interurban lines. In the tables there are separate statements for each of these groups and each group is further subdivided according to the sizes of the companies.

The best showing of the year was made by the combination city and interurban companies. The number of revenue passengers carried increased about 9 per cent. Due to a lower average rate of fare, however, the operating revenue decreased 2.65 per cent. This was more than offset by a decrease of 3.56 per cent in operating expenses, leaving a net revenue 0.36 per cent greater than in 1923. Taxes also were reduced, and although fixed charges were higher they were not enough to cancel the other gains, so that there was an increase of more than 7 per cent in net income. The operating ratio of this group dropped from 76.88 to 76.16 per cent.

When the group is further subdivided according to the sizes of the companies it is found that the improvement is confined to the large companies—those earning more than $1,000,000 a year. The operating ratio of these companies dropped from 75.13 per cent to 73.94 per cent and the final net income increased some $314,000, or 9.27 per cent. On the other hand, the medium-sized companies fared badly. The operating ratio rose from 83.44 to 84.76 per cent. The small companies of this group, earning less than $250,000 a year, fared even worse than the others. The operating ratio of these companies was 87.56 per cent in 1923 and in 1924 it was 91.94 per cent.

The interurban companies had a very bad year. The combined income statement of the whole group, consist-

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TABLE XVI—INCOME STATEMENT OF 93 CITY COMPANIES, 111 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

(On a car-mile basis)

	City Lines			Interurban Lines			City and Interurban Lines		
	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease	1924 (Cents per Car-Mile)	1923 (Cents per Car-Mile)	Per Cent Increase or (D) Decrease
Railway operating revenue	46.70	46.93	(D) .49	43.03	45.44	(D) 5.30	43.25	45.25	(D) 4.42
Railway operating expense	34.42	34.37	.15	35.37	36.19	(D) 2.27	32.94	34.78	(D) 5.29
Net operating revenue	12.28	12.56	(D) 2.23	7.66	9.25	(D) 17.18	10.31	10.47	(D) 1.53
Net revenue: Auxiliary operations	.45	.45	.....	2.53	2.25	12.44	2.10	1.94	8.24
Taxes	3.21	3.26	(D) 1.53	2.66	2.77	(D) 3.97	3.07	3.25	(D) 5.54
Operating income	9.52	9.75	(D) 2.36	7.53	8.73	(D) 1.37	9.34	9.16	1.97
Non-operating income	.69	.70	(D) 1.43	.78	.72	8.33	1.17	1.24	(D) 5.64
Gross income	10.21	10.45	(D) 2.30	8.31	9.45	(D) 12.06	10.51	10.40	* 1.05
Deductions from gross income	8.12	7.85	3.43	8.33	8.18	1.83	8.87	8.85	.22
Net income	2.09	2.60	(D) 19.62	*.02	1.27	(D) 101.57	1.64	1.55	5.80

* Deficit.

TABLE XVII—OPERATING EXPENSES OF 93 CITY COMPANIES, 111 INTERURBAN COMPANIES AND 57 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

(On a car-mile basis)

	City Lines			Interurban Lines			City and Interurban Lines		
	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease	1924 (Cents)	1923 (Cents)	Per Cent Increase or (D) Decrease
Way and structures	4.68	4.92	(D) 4.88	6.46	6.39	1.09	4.85	5.40	(D) 10.18
Eqipment	4.38	4.19	4.53	4.28	4.38	(D) 2.28	4.03	4.31	(D) 6.49
Power	4.50	4.87	(D) 7.60	5.67	6.16	(D) 8.27	5.11	5.60	(D) 8.74
Conducting transportation	15.48	15.15	2.18	12.95	13.07	(D) .092	13.17	13.44	(D) 2.01
Traffic	.08	.07	14.28	.29	.30	(D) 3.33	.23	.22	4.54
General and miscellaneous	4.70	4.62	1.73	5.63	5.82	(D) 3.26	5.18	5.35	(D) 3.17
Transportation for investment—Cr	.02	.02	.....	.01	.01	.....	.01	.01	.....
*Total operating expense	34.44	34.39	.14	35.37	36.20	(D) 2.30	32.95	34.78	(D) 5.26
*Undistributed expense included in total	.60	.55	9.09	.08	.07	14.28	.37	.45	(D) 17.77

ing of 111 companies, shows a net income of $2,815,039 in 1923 turned into a deficit of $36,459 in 1924. Passenger traffic was off about 6 per cent and operating revenue declined 5.74 per cent, while the operating ratio rose from 79.65 per cent to 82.21 per cent. Taxes went down 4.37 per cent, but fixed charges increased 1.38 per cent. Again, as in the case of the combination group, it was the smaller companies that were most adversely affected.

Operations of the city lines were affected more in 1924 by the uncertain business conditions and less by priyate automobile and bus competition. Passenger traffic for the whole group decreased only a little more than 2 per cent. The average rate of fare, on the other hand, was increased from 6.3 cents to 6.5 cents, so that the decrease in revenue was only 0.46 per cent. Operating expenses, however, increased slightly, 0.17 per cent, so that there was a decrease in net operating revenue of 2.18 per cent. This increase in operating expenses was due to the fact that practically all of the increase in the maintenance of equipment and conducting transportation accounts described in connection with the review of the combined statement of the whole industry is chargeable to the operations of the city lines.

The operating ratio went up from 73.23 per cent to 73.70 per cent. Taxes increased 1.27 per cent and fixed charges 3.50 per cent, producing a decrease in the final net income of 19.51 per cent.

The very small city lines are in the poorest condition of any of the groups in the country; their combined operations are so comparatively small, however, that they weigh very little in the group.

Railway in Phoenix to Quit on Oct. 20

At a recent meeting of stockholders of the Phoenix Railway, Phoenix, Ariz., it was unanimously voted to cease operations of all of its city and suburban lines on Oct. 20. In fulfillment of this action the company has served official notice on the Arizona Corporation Commission, the City Commission and County Supervisors of its intention. This notice is signed by M. H. Sherman, president, and A. I. Smith, secretary of the company.

The railway dates back to 1887. It was electrically equipped in 1893 and later extended to nearly all sections of the city. Practically all the stock and the bonds are understood to be in the hands of Los Angeles residents. With development of auto transportation, the revenues of the company decreased materially, while paving charges and taxes increased.

A sale of the system is said to have been prevented by a suit for annulment of franchise filed against the company by Mayor L. B. Whitney about a year ago. It is understood that the system will be offered for sale for the value of its material. Efforts already have been started looking toward its acquisition by the city, for possible resale or lease. Several members of the City Commission express opposition to abandonment and to reliance on bus lines, two of which have asked for franchises.

Phoenix is a city of about 30,000. The railway has been operating 32 miles of line.

TABLE XVIII—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

	93 City Companies			111 Interurban Companies			57 Companies Operating Combined City and Interurban Lines		
	1924	1923	Per Cent Increase	1924	1923	Per Cent Increase	1924	1923	Per Cent Increase
Railway operating revenue	$349,247,964	$350,874,322	(D) 46	$95,267,622	$101,063,931	(D) 5.73	$91,543,786	$94,036,833	(D) 2.65
Per mile of single track	[1]$35,501	[1]$35,736	(D) .65	$10,603	$11,317	(D) 6.30	$15,497	$15,838	(D) 2.15
Gross income	$76,403,175	$78,146,819	(D) 2.24	$18,410,752	$21,010,317	(D) 12.38	$22,245,793	$21,622,867	2.88
Per mile of single track	$7,766	$7,959	(D) 2.43	$2,049	$2,352	(D) 12.89	$3,765	$3,641	3.40
Passenger revenue	$340,688,213	$342,007,362	(D) .38	$78,694,254	$83,741,008	(D) .60	$84,809,260	$87,213,569	(D) 2.75
Per revenue passenger	[1]6.5c	[1]6.3c	3.18	[2]9.6c	[2]9.6c	....	[3]7.9c	[3]8.8c	(D) 10.22
Per total passenger	[1]5.0c	[1]5.0c	(D) ...	[2]8.1c	[2]8.2c	(D) 1.21	[3]7.1c	[3]7.6c	(D) 7.58
Per mile of single track	34,631	$34,833	(D) .58	$8,759	$9,377	(D) 6.59	$14,357	$14,689	(D) 2.26
Per passenger car-mile	j45.7c	45.9c	(D) .43	39.2c	[4]41.3c	(D) 5.08	41.2c	43.1c	(D) 4.41
Per car operated	[4]$16,894	[4]$16,946	(D) .31	[6]$15,713	[6]$17,188	(D) 8.58	[7]$15,107	[7]$16,357	(D) 7.64
Per passenger car-hour	[5]$4.08	[5]$4.13	(D) 1.21	[5]$4.20	[5]$4.36	(D) 3.66	[8]$3.85	[8]$3.99	(D) 3.50
Revenue passengers	15,218,486,238	[4]5,348,283,037	(D) 2.42	[2]798,675,510	[2]850,111,921	(D) 6.05	[9]1,076,665,369	[9]97,339,167	9.04
Per mile of single track	[1]530,910	[1]545,166	(D) 2.61	[2]90,643	[2]96,665	(D) 6.22	[9]205,448	[9]187,796	9.39
Per passenger car-mile	17.0	17.2	(D) 2.78	[2]4.1	[2]4.2	(D) 2.38	[9]5.6	[9]5.3	5.67
Per car operated	[10]258,142	[10]263,832	(D) 2.16	[12]172,630	[12]189,624	(D) 8.96	[13]229,126	[13]215,039	6.56
Per passenger car-hour	[11]62	[11]63	(D) 1.59	[11]55	[11]58	(D) 5.17	[14]57	[14]53	7.54
Total passengers	[16]6,749,384,004	[16]6,897,294,982	(D) 2.14	[2]942,840,718	[2]996,073,786	(D) 5.34	[9]1,193,870,787	[9]1,150,653,618	3.75
Per mile of single track	[1]686,658	[1]703,062	(D) 2.33	[2]107,004	[2]113,262	(D) 5.52	[9]227,813	[9]218,859	4.09
Per passenger car-mile	19.0	19.2	(D) 2.17	[2]4.8	[2]5.0	(D) 4.00	[9]6.4	[9]6.3	1.58
Ratio: Transfer passengers to revenue passengers (per cent)	28.5%	28.0%	1.78	17.3%	16.5%	4.84	8.8%	14.4%	(D) 38.89
Revenue car-miles	747,767,250	747,501,171	4.04	221,392,024	222,435,459	(D) .46	211,668,910	207,835,542	1.84
Per mile of single track	76,012	76,132	(D) 1.57	24,641	24,909	(D) 1.07	35,832	35,005	2.36
Per car operated	[4]36,898	[4]36,790	.29	[10]42,579	[10]44,365	(D) 4.02	[7]36,982	[7]37,370	(D) 1.04
Per car-hours	[5]8.9	[5]8.9	....	[5]10.7	[5]10.6	.94	[8]9.4	[8]9.3	1.07
Car-hours	79,221,419	78,993,517	.29	17,538,703	17,806,295	(D) 1.50	20,270,743	20,161,467	.54
Per car operated	[15]4,124	[15]4,112	.29	[16]3,885	[16]3,808	1.23	[17]3,984	[17]4,088	(D) 2.54

[1] 191 companies; [2] 109 companies; [3] 55 companies; [4] 484 companies; [5] 590 companies; [6] 689 companies; [7] 744 companies; [8] 850 companies; [9] 955 companies; [10] 1082 companies; [11] 1188 companies; [12] 1286 companies; [13] 1343 companies; [14] 1448 companies; [15] 1583 companies; [16] companies; [17] mpanies

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$39,734 After Dividends for Baltimore Interurban

Actual earnings of the Washington, Baltimore & Annapolis Electric Railroad, Washington, D. C., for the year ended Dec. 31, 1924, applicable to interest on the funded debt were $713,135, or approximately 1.4 times the interest charges. Out of this sum $139,065 was set aside for depreciation and maintenance and $39,334 for amortization of discount on funded debt, with the result that after these charges and the payment of $516,205 for interest on the funded debt, there remained a balance of $18,529. To this there is added a profit and loss credit of $47,612, bringing the profit and loss for the year up to $66,142. Preferred dividends took $26,407, leaving the profit and loss at $39,734.

SUMMARY OF INCOME AND PROFIT AND LOSS OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

Year Ended Dec. 31, 1924

Operating revenue		$2,818,084
Operating expenses prior to provision for depreciation		2,017,303
Net operating revenue prior to provision for depreciation		$800,781
Taxes assignable to railway and other operations		117,085
Operating income prior to provision for depreciation		$683,695
Non-operating income (net)		29,439
Gross income for the year applicable to interest on funded debt		$713,135
Deductions from gross income:		
Interest on funded debt	$516,205	
Amortization of discount on funded debt, etc.	39,334	
Provision for depreciation	139,065	
		694,605
Net income for the year		$18,529
Profit and loss net credits during the year		47,612
Profit and loss gross surplus for the year		$66,142
Dividends paid (1½ per cent on preferred capital stock outstanding)		26,407
Profit and loss surplus for the year		$39,734
Profit and loss surplus at beginning of the year		488,103
Profit and loss surpluse at close of the year		$527,837

The report is not only the report of the Washington, Baltimore & Annapolis Electric Railroad but includes also the operations of its subsidiaries—the Annapolis & Chesapeake Bay Power Company, the Terminal Real Estate Company and the Maryland Development & Realty Company of Anne Arundel County. The last two named corporations are minor companies, adjunctive to the parent corporation. But the first one, the Annapolis & Chesapeake Bay Power Company, which one commentator says "has contributed this additional sum to the treasury for the year, gives promise of becoming a powerful factor and a large earner for the parent company."

In the operation of the railway system proper the per-car-mile earnings for 1924 dropped to 52 cents, as against 54.3 cents in 1923, and 56.13 cents in 1922. It must be borne in mind, however, that the company applied to the Public Service Commission of Maryland about the middle of the year for an increase in passenger and freight rates to offset substantial increases in employees' wages and the benefit of these fare increases did not accrue to the company until the latter part of the calendar year. Among current assets the company shows cash of $215,688 and marketable bonds valued at $408,390.

Detroit United Affairs Being Discussed

Expectations Ahead That Refinancing Plan May Be Submitted Soon—Receivership Action in Best Interests of Everybody—Railway and Bus Articulation Program Proceeding

NOTHING tangible, nothing definite, has been done toward working out a financial program for the Detroit United Railway for the future. It is true there has been some discussion among large Canadian holders of the stock of the company in regard to the best course to be pursued, but that is as far as matters have gone. New York financial interests in intimate contact with the affairs of the company anticipate possible action in the near future, but events are shaping themselves slowly so that the program finally decided upon may be made to care adequately for the future.

In this connection opinion in New York reflects the very meager information from Toronto that an assessment of stockholders is in prospect. The extent of this assessment is not certain, but it may possibly be as much as 33⅓ per cent. At first appearance this might seem to be a heavy burden, but it would only be so relatively. Large holders of stock are said to be agreed that this is the best way out, and indications point to a possible definite statement being made soon to all the stockholders.

An assessment such as has been suggested would require present holders to contribute an additional $5,000,000, but the raising of this sum would permit the company to meet obligations necessary to be got out of the way and at the same time would provide funds to carry out unimpeded the program for rehabilitation, with which the sponsors for the bonds are in accord.

It is in the interest of the stockholders more so than it is of the bondholders that the system be preserved as a whole. In fact, the application for the appointment of receivers was presaged on this very need. As a means to this end the Yellow Coach Manufacturing Company acted in an entirely friendly capacity as a party to a proceeding that was perfectly logical and thoroughly in keeping with precedent in similar cases, notably the railway receiverships in New York and Pittsburgh and more recently the action in the case of Union Traction Company of Indiana, in all of which preservation of the rights of every one concerned was sought to be achieved *pari passu* through a particular creditor acting in behalf of himself and others.

At the time of the receivership every effort was made to emphasize the friendly nature of the proceeding, but it has since come to the attention of the railway management that an effort had been made in some quarters to attach to the purely friendly proceeding of the Yellow Coach Manufacturing Company an onus for what it did that does not square with the facts. As a result T. P. Pinckard, president of the People's Motor Coach Company, affiliated with the Detroit United, and other officers of the company have had occasion to put themselves formally on record with respect to the receivership proceeding to the end that the matter shall be thoroughly understood. After making full acknowledgment of the invaluable service of the operating experts of the Yellow Coach Manufacturing Company, and above all of the very liberal terms and conditions upon which all of the bus negotiations were made, without which it would have been almost impossible for the coach operations to have been undertaken. Mr. Pinckard says that even in the face of the possibility of the manufacturer suffering large losses the attitude of the Yellow Coach Manufacturing Company "was as favorable and as helpful as it has always been, and I defy any one to face me with the accu-

STATISTICS OF OPERATION OF THE WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD

CAR-MILES

	On W., B. & A. E. R.R. Tracks	On Tracks Operated Under Contract	Total
Passenger	4,292,886	429,467	4,722,353
Freight	251,333	20,316	271,649
Service	10,070	.....	10,070
Totals	4,554,289	449,783	5,004,072

All car-miles are based on our standard equipment, viz., 40-ton cars.

REVENUE PASSENGERS CARRIED

1924	1923	1922	1921	1920	1919
4,429,387	4,644,472	4,570,996	4,692,860	3,992,991	4,608,875

EARNINGS

	1924	1923	1922	1921	1920	1919
Per car-mile (cents)	52.00	54.30	56.13	53.60	53.48	47.28
Per miles of track operated	$17,763	$18,152	$18,248	$18,841	$19,907	$20,875
Per mile of road	$32,212	$32,916	$33,092	$34,173	$38,077	$39,450
Per passenger (cents)	46.76	45.58	46.98	45.97	44.27	41.03

STATEMENT OF MILEAGE

	On W., B. & A. E. R.R. Tracks	On Tracks Operated Under Contract	Total
Miles of single track	73.524	6.667	80.191
Miles of second track	40.934	6.667	47.601
Miles of sidings and turnouts	18.8708	.....	18.8708
Total mileage operated	133.3288	13.334	146.6628

Includes Annapolis Short Line.

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sation that it has pursued other than an honorable and a self-sacrificing course throughout the entire matter."

Other officers of the railway are no less insistent. Sir Thomas Tait, vice-president of the railway, is on record to the effect that the petitioner "acted throughout the whole affair in a most friendly, generous and constructive manner." As one of the directors who had to do with the negotiations, he says that the assistance and co-operation of the manufacturer in the matter "merit thanks and appreciation."

Thomas G. Long of counsel for the railway also has gone similarly on record.

Mr. Long has said:

> When toward the end of the first week in March, the affairs of the railway became critical, the most serious question confronting those then handling the affairs of the railway was just where they could look for friendly co-operation. The suggestion of Mr. Babcock, secretary and treasurer of the Yellow Coach Manufacturing Company, that the Yellow Coach Manufacturing Company would be glad to file a petition for a receivership for the protection of all concerned was a great relief to all of us. It was very apparent to all of us that no action other than an equity receivership could protect the situation.

So much for that phase of the matter. As to the future, some aspects ahead have already been touched upon. Current earnings of the system are holding up well. There is still a considerable measure of duplication of service, but that will be corrected just as soon as the bus and the railway services can be articulated to the best advantage. This is a matter of experiment. Despite the need for conservative management there is apparently no desire on the part of the officials to push one type of service at the expense of the other. Indeed, that would in no way solve the problem.

Not every one may be inclined to agree with the opinion recently expressed that "if the motor bus development of the company had got under way twelve months earlier a receivership would not have happened as it did," but this is the opinion of a disinterested observer writing recently in the *Wall Street Journal* from Detroit. This same unusually well informed authority says that taken by and large the situation of the Detroit United appears to be simply one of a famine in working capital occurring in the midst of an important evolution in its business. This famine in working capital would be promptly corrected under the assessment plan suggested, which, as has been pointed out, would preserve the property as a whole and increase the equity of the stockholders who do their part.

Wants to Abandon Line in Troy

The United Traction Company, Albany, N. Y., applied to the Public Service Commission on April 27 for permission to abandon its Oakwood Avenue line in Troy. H. B. Weatherwax, president, said that the paving program of the city would cost the company approximately $54,000; that the line had never been operated at a profit, and that there was no reasonable prospect that in the future sufficient revenue could be obtained from its operation to pay its proper proportion of expenses of operation, taxes and interest.

The company offered to serve the territory with buses at a rate of fare to be the same as might from time to time be charged by the United Traction Company on its trolley lines in Troy, with interchangeable transfers.

Seattle-Rainier Purchase Brings Up Many Points of Difference

In the opening conference between representatives of the city of Seattle and officials of the Seattle & Rainier Valley Railway, on the proposed purchase of the traction company's system by the city, the two groups of officials questioned the correctness of the appraisal set by the experts for the city. Walter M. Brown, general manager of the company, held that the city's appraisal of $1,045,547 was $500,000 too low. Another question which Mr. Brown says he will bring up is the interest paid by the company on construction bonds. He also pointed out that in the city's appraisal no allowance was made for franchise value, engineering, legal and general expense.

Mr. Brown also questioned the value placed on the company's steel cars. These items will all be considered at a second meeting in the near future.

The appraisal value set by the recent survey of the utilities department is $210,000 higher than an apprasial made of the same property a little less than five years ago by City Councilmen.

The detailed appraisal shows that the gross revenues of the line in 1924 were $34,000 less than in 1923. A report made by D. W. Henderson, superintendent of the Seattle Municipal Railway, showed that the gross revenues for 1923 were $460,609 and the operating expense $302,719, leaving a total of $157,889 as operating income, from which $110,380 was to be paid in real and personal taxes and interest on delinquent taxes. The report of Mr. Henderson set forth that by the elimination of taxes and other items the city could operate the lines $200,000 cheaper than could the private concern.

Value Reduced.—The capital value of the Youngstown Municipal Railway, Youngstown, Ohio, has been reduced $35,038 by the City Council. This is the result of returning the North Avenue power station to the Pennsylvania-Ohio Power & Light Company. Reducing the valuation saves approximately $2,450 a year in interest.

Partial Abandonment Petition Before Commission. — The Alabama Power Company has applied to the Public Service Commission for permission to abandon and dismantle its railway service and tracks in Anniston, Ala., on Moore Avenue between Thirteenth Street and Tenth Street and on Tenth Street between Moore Avenue and Noble Avenue.

No Dividend in Stock for American Light & Traction.—The American Light & Traction Company, New York, N. Y., has declared a quarterly dividend of 1¾ per cent in cash on the common stock, payable on May 1 to stock of record April 15. Heretofore the company has paid 1 per cent in cash and 1 per cent in common stock quarterly on the common. The regular quarterly dividend of $1.50 was also declared on the preferred, payable May 1 to stock of record April 15. The company's common capital stock has been increased since June 30, 1909, from $8,279,100 to an amount now outstanding of $32,195,000, practically all of which has been paid in at par through the medium of stock dividends issued against undivided surplus.

Earnings of Main Road Off.—March recorded the largest drop in gross revenue since the 8-cent fare went into effect on the Portland Railroad, Portland, Me., operated by the Cumberland County Power & Light Company. Revenue from the railway department during March was $132,808. This represented a decrease of $19,647 over the revenue from the same department in March, 1924. For the first three months of the current year the gross revenue has been $410,413 and the decrease in returns as compared with the first three months of 1924 has been $43,284. This condition is attributed in part, and particularly in March, to the open winter, the unusually warm weather, and the tremendous increase in number of automobiles purchased.

Seeks to Abandon All Railway Lines.—The Union Traction Company, Santa Cruz., Cal., has applied to the Railroad Commission for authority to abandon operation of its remaining railway facilities between the intersection of Mission Street and Pacific Avenue and a point opposite the Casino, and to abandon service thereon. The company was previously authorized by the Railroad Commission, subject to approval by city officials, to abandon service on its Cliff Drive line, but the City Council refused to act, stating that when the company desired to abandon all its service it would grant the necessary authority.

Salt Lake City Company Reports for 1924.—Operating income of the Utah Light & Traction Company, Salt Lake City, Utah, for 1924 is shown in a report filed with the Public Utilities Commission of Utah to have been $373,608. This, including taxes for the year paid, is 4.16 per cent of the valuation of the company as set up by the commission for rate-making purposes. The statement shows railroad operating revenues for the year of $1,853,000, about $5,000 less than in 1923. Operating expenses, however, increased $8,000. Taxes, $129,100, were $6,300 less than in the previous year. The report shows a non-operating income from rental of the power plant of the company and the gas equipment at Ogden of $535,000, an increase of $43,000 as compared with the previous year. Gross income, therefore, was $910,000, while fixed charges included $841,765 as interest on funded debt; $67,589 other interest, and $15,168, amortization of discount on the funded debt. This leaves a deficit in the income for the year of $14,159. The increase in the operating expenses is more than accounted for by an increase of $74,000 in expenditures on the equipment. Correspondingly, the expenditures under the heading cost of conducting transportation were reduced $54,000 in the one year, of which $51,000 was reduction in the total paid to passenger conductors, motormen and trainmen.

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Legal Notes

FEDERAL DISTRICT COURT.—*Review of Valuation by Public Utilities Commission.*

The District Court will not review the valuation of a public utilities commission of the property of a utility, but will merely determine whether the valuation and rate fixed by the commission are confiscatory. If they are confiscatory, it is for the commission and not the court to make the correction. (Ohio Bell Telephone Co. vs. Public Utilities Commission, 3 Federal (Second) Rep., 701.)

FEDERAL SUPREME COURT.—*Determination of Reproduction Value and rate of Return.*

Reproduction value should include a reasonable allowance for organization expenses, interest during the construction period, and other overhead charges which necessarily would be incurred in reproducing the utility. Proof of actual expenditures for these purposes, while helpful, is not indispensable. A rate which allowed this utility less than 5 per cent on the value of its property was confiscatory. (Ohio Utilities Co. vs. Public Utilities Commission of Ohio, 45 Supreme Court Rep., 259.)

FEDERAL SUPREME COURT. — *Operation at Loss Does Not Warrant Abandonment of Part of Lime.*

A public utility cannot, because of loss, escape obligations voluntarily assumed. The fact that a company must make a large expenditure in relaying its tracks because of change of grade and expects a deficit from operation does not render the order void. The company is at liberty to surrender its franchise and discontinue operation throughout the city, but it cannot continue to enjoy its franchise and escape from the burden incident to its use. (Fort Smith Light & Traction Co. vs. Bourland et al, 45 Supreme Court Rep., 249.)

FEDERAL SUPREME COURT.—*State Statute Prohibiting Interstate Operation of Bus a Violation of Commerce Clause.*

The plaintiff wished to operate an auto-bus line between Seattle, Wash., and Portland, Ore., and obtained an Oregon license. His certificate of public convenience and necessity in Washington was refused by the State Director of Public Works under the laws of state, which declared such a certificate may not be granted for any territory already adequately served by the holder or holders of existing certificates. State regulations, which are adopted primarily to promote safety on the highways and conservation in their use are not obnoxious to the commerce clause, provided the indirect burden imposed by them upon interstate commerce is not unreasonable. But a state law, which prohibits competition and allows the use of the highways to some but not to others and permits state officers to determine whether the facilities for conducting interstate commerce are adequate, is forbidden by the commerce clause of the United States. (Buck vs. Kuykendall, 45 Supreme Court Rep., 324.)

KENTUCKY.—*Injury to Automobile Inclosed by Curtains.*

Where a motorman did not signal by bell or horn to an automobile on the track, when that automobile was fitted with curtains which obscured the sight of the driver, the motorman was guilty of negligence. (Price vs. Kentucky Traction & Terminal Co., 269 Southwest Rep., 303.)

MISSOURI.—*Street Workman and Humanitarian Rule.*

While the humanitarian rule will not ordinarily be applied in all its strictness to section men or track men whose business is to keep tracks of railroads and street railway companies in repair yet where work had been carried on in a street for some time, so that motormen should know that laborers were repairing the pavement near the track, an instruction permitting a verdict in favor of such a laborer on the hypothesis that the motorman saw "or by the exercise of ordinary care would have seen" him in a position of peril in time to avert the injury was upheld. (Thomas vs. Wells, 267 Southwest. Rep., 46.)

NEW JERSEY.—*Burden of Proof of Negligence.*

A passenger complained that while stepping from the lowest car step to the ground, she received a shock from currents which were permitted to leak to the step of the car, and when asked how she knew it was an electric shock, she said she felt the same sensation as when using electric batteries for the cure of rheumatism. The court held that unless the defendant was able to rebut this testimony, the jury was entitled to draw the inference of negligence. (McKittrick vs. Public Service Railway, 128 Atlantic Rep., 226.)

PENNSYLVANIA. — *Passenger Injured While Entering Left-Hand Door.*

A passenger signaled a trolley car which stopped. The passenger then indicated her intention to board it by the usual right-hand rear-entrance. The conductor refused to admit her there and opened the left rear door because the car was on the side of the highway and the ground on the left-hand side was higher. While the passenger was boarding the car on this side, she was struck by an automobile. The company claimed that the automobile driver was the only one negligent and the Supreme Court of Pennsylvania affirmed this view. [Martin vs. Philadelphia R. T. Co., 127 Atlantic Rep., 765.]

RHODE ISLAND.—*Liability for Cost of Strengthening Bridge Over Railroad.*

The Public Utilities Commission was held to have jurisdiction after proper hearing, to order a steam railroad to repair or reconstruct the framework of a bridge over its right-of-way so as to permit the location thereon of a second street railway track, subject to the requirement that the street railway pay the expenses incident to this extra burden. (United Electric Railway vs. City of Cranston et al, 128 Atlantic Rep., 213.)

TENNESSEE—*Anti-Trust Act Is Inapplicable to Public Utility.*

Because of consolidation and various energy purchase contracts, several power plants in Tennessee were shut down. The attorney general brought suit under the State anti-trust Act on the ground that there was a monopoly in the production, distribution and sale of commercial electricity. The Supreme Court held, however, that utility companies subject to the control of the Public Utility Commission did not come under the Anti-Trust Act, as their prices are subject to the power of regulation and control by the state. (State ex rel. Thompson vs. Nashville Railway & Light Co. et al., 268 Southwest Rep., 120.)

VERMONT. — *Power of Public Service Commission Limited.*

The Public Service Commission of Vermont has only such powers as are conferred upon it by the Legislature. It has no power to relieve a railway of the duty of maintaining its tracks in a city street and no power to authorize the railway to abandon operation on part of its lines. Where a railway threatens to discontinue a service, the town affected may apply for relief to the Chancery Court, which will decide whether a temporary or a permanent injunction shall issue. [Town of West Rutland vs. Rutland Railway, Light & Power Co., 127 Atlantic Rep., 882 and 883 (two cases).]

VIRGINIA—*Power of State to Fix Rates and Permit Railway to Abandon Line, Notwithstanding Contract with City.*

Under the Virginia constitution, though the State may confer on a city the power to contract as to rates of public service corporations using the streets, the State may change the terms of such contract between city and utility through the exercise of its police power. Such a regulation by the State does not impair the obligation of contracts between the city and the public service corporation, since the contract was entered into, subject to the State exercise of police power. The State may also, under proper condition and to avoid confiscation, permit a street railway to abandon facilities. Under the Federal Constitution, a street railway cannot be obliged to continue operation of a particular line, where such continued operation would result in the confiscation of property, and therefore the taking of property without due process of law. [City of Richmond vs. Virginia Ry. & P. Co., 126 Southeast Rep., 353, also City of Portsmouth vs. Same (two cases), 126 S.E. Rep., 362, 366.]

WEST VIRGINIA. — *Repudiation of Release.*

In an action for damages for personal injuries, the plaintiff cannot repudiate a written release of all claims arising out of his injuries on the ground of fraud or mental incompetency to contract, unless he returns everything of value received by him in consideration for the release or offers to do so. (McCary vs. Monongahela Traction Co., 125 Southeast. Rep., 92.)

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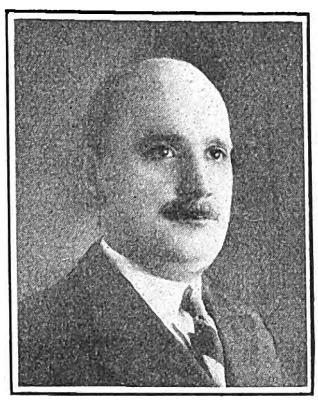
Personal Items

Former Receiver Heads Road

H. J. Sheeran in Charge of Reorganized New York Surface Line—Started Career at Bottom

Hugh J. Sheeran has been elected president of the New York Railways Corporation, New York City, the successor to the New York Railways under receivership and foreclosure. Announcement to this effect was made on April 24 as part of a statement for publication in the newspapers that day. The fact that the receivership was to end on May 1 was front page news, despite all the recent big events of national and international importance. Right in the center of the story about the termination of the receivership, but credited to Mr. Cotton as the spokesman for the



H. J. Sheeran

protective committee of security holders, was the announcement about Mr. Sheeran. In his very brief official statement Mr. Cotton said: "Mr. Sheeran is a remarkable operating man who has risen from the ranks. He is only 42 or 43 years old, but he has demonstrated great capacity in running these roads."

This was a fine compliment, paid by one of New York's most noted specialists in corporation law. Twenty-five years ago Mr. Sheeran, just now very much in the public eye, walked into the office of the old Metropolitan Street Railway in the Cable Building, 621 Broadway, in search of a job. It is the same building in which Mr. Sheeran now holds forth as president of the successor company and as president of the Manhattan Surface Coach Company, organized to handle the bus business which the reorganized corporation intends to develop.

Mr. Sheeran was then less than 17 years old. At the head of the railway at that time was H. H. Vreeland, then, as now, a great believer in young men. In coupling up with the railroad, "Hughie," as he is familiarly known, followed in the footsteps of his father, an employee of the company. As his associates at one time or another Mr. Sheeran has worked side by side or in close touch with nearly all the present officers of the New York Railways and the Interborough Rapid Transit Company and with Oren Root, Frederick T. Wood, L. H. Palmer and Freddie Dell, all now well known in railway circles, to mention just a few.

He went to work in the operating department. Very early in his career Mr. Sheeran manifested a keen aptitude for figures and statistics of all kinds. In fact, the remark: "Ask Hughie, he knows," became part of the lexicon of the Metropolitan Street Railway office long before a clever advertising man caught up a similar expression and turned it to a use considered by some to be a base one. Not only that, but Mr. Sheeran had meanwhile learned to make pothooks and to interpret them correctly, a feat many business men were inclined to regard as impossible of achievement in the days before writing by character instead of letter had been reduced to its present science. This further stamped him as being thorough.

On the foundation thus laid was the structure reared. Mr. Sheeran's progress cannot be followed in all its details. He passed not rapidly but gradually through all the intervening jobs, mastering each as he advanced, until on the appointment of the late Job E. Hedges as receiver he was made assistant secretary to Mr. Hedges. The next natural step was to the post of secretary to the receiver. Frank Hedley, president of the Interborough, was the general manager for the receiver, but he relinquished the post with the surface railway because of the pressure of his other duties. Mr. Sheeran succeeded him. Then when Mr. Hedges fell ill and was forced to retire from active business the financial interests back of the company named Mr. Sheeran to succeed him.

Mr. Sheeran does not shy at a new idea. Witness his recent plea for bus operating rights in downtown Manhattan. It is one of the most comprehensive plans of the kind so far proposed. If, as and when this plan goes through, said advisedly considering the New York political situation, Mr. Sheeran can be counted upon to do the job thoroughly.

In the meantime Mr. Sheeran is carrying on successfully with the 75 miles of conduit surface lines under his jurisdiction. In discussing the outlook for the railway Mr. Cotton said he was "feeling exceptionally good over the whole situation." Everything considered, but particularly the fact that the destiny of the road is in Mr. Sheeran's hands, no reason is apparent why he should be anything but optimistic.

George M. Taylor has been elected vice-president and Daniel Stafford assistant secretary and treasurer of the Virginia Railway & Power Company, Richmond, Va.

Mr. West in Salt Lake City

Former Denver Tramway Official Has Already Entered Upon His New Work

Edward A. West, the new general manager of the Utah Light & Traction Company, Salt Lake City, Utah, left his previous post, that of general superintendent of the Denver Tramway, with this expression of gratitude from his co-workers in the executive offices of the tramway: "Merit has won and we wish Edward A. West all the good things he deserves."

Officials of the tramway give much credit to Mr. West for his handling of its affairs during the trying times of the last few years and his leadership when the then Mayor of the city took the stand that the company could not obtain more than a 5-cent fare, despite the fact that war-time prices were being charged everywhere else. This case the company won only after it had been carried to the federal court.

During the years of 1909-1913 Mr. West was assistant to the chief engineer and general superintendent of the

E. A. West

Portland Railway, Light & Power Company, Portland, Ore. From 1913 to 1916 he was efficiency engineer for the same company. From Portland he went to Denver as chief engineer of the Denver Tramway, the appointment being made in April, 1916. He was made general superintendent of the Denver Tramway on Jan. 1, 1919.

Mr. West was born at Wiarton, Ont., on Nov. 5, 1882. He was graduated from Tufts College as a mechanical engineer, and then took a two-year course in electrical engineering at the Massachusetts Institute of Technology.

Promotions in Engineering Staff at Hampton

N. E. Drexler, formerly chief engineer for the Newport News & Hampton Railway, Gas & Electric Company, with office at Hampton, Va., has been made acting manager of the gas and electric departments of that company.

J. W. Howard, formerly assistant chief engineer, has been promoted to engineer.

Leo Kelly, chief engineer for some time, has been made assistant chief engineer.

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Obituary

F. N. Root

Fred N. Root, president and general manager of the Root Spring Scraper Company, Kalamazoo, Mich., died on April 10, following an operation. Mr. Root had been in failing health for the last few years, having had a very serious operation in 1921. His last illness dates from Thanksgiving, since which time he had been confined to his bed, although hopes were at first held out for his recovery.

For the last 30 years Mr. Root had been head of the Root Spring Scraper Company, which he organized and finally incorporated in 1921. He held many valuable patents on snowscrapers and life-guards and his products were well known in the railway field.

Mr. Root was born in Kalamazoo on May 25, 1850. His father was a Kalamazoo pioneer, having built the toll-gate roads, and was head of the first bus company in Kalamazoo. Mr. Root attended Devoe College at Niagara Falls, N. Y., and later entered business with his father at Kalamazoo. After the death of his father, Mr. Root entered the ice business. He was at one time president of the Kalamazoo Ice Company.

Mr. Root had been a regular attendant at the railway conventions for the last 30 years. He enjoyed a large circle of friends and acquaintances, by whom he was admired for his sterling qualities and business integrity. Mr. Root's son Newton and his daughter will carry on the business.

Sir Augustus Nanton, formerly president of the Winnipeg Electric Company, Winnipeg, Man., successor to the Winnipeg Electric Railway, and a leading Canadian financier, died on April 24 in his home in Toronto. In the course of his life of 65 years he held many prominent positions. Because of his removal to Toronto to become president of the Dominion Bank he resigned as president of the Winnipeg Electric Company on Dec. 15, 1924, but continued as a member of the board. Sir Augustus had been connected with the affairs of the Winnipeg property since 1898. Upon his retirement from the office of president he was presented with an illuminated address signed by the directors and executive officers, gratefully acknowledging his valued services. He was succeeded as president by George W. Allan, K. C.

Charles Woodward Lamb, advertising counselor for the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., died April 16 at Milwaukee. He entered the service of the Milwaukee property in 1906 as right-of-way agent for the real estate department.

Stephen S. Emery died recently at Allentown, Pa. He was interested in the building of the Norristown & Lansdale Electric Railway, which was afterward absorbed by the Lehigh Valley Transit Company. After this road was built he transferred his interests to the Chambersburg & Gettysburg Electric Street Railway.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Warns Against Timber Waste

Practical surveys of the timber situation of the country show that half of the waste of timber could be prevented. It is known that one-sixth of the entire timber consumption is lost through decay. In the field of ties, fence posts, mine timber, poles and piling the preventable waste is said to equal 600,000,000 cu.ft. of wood a year that might be saved by proper preservative treatment. *Wood Preserving News* for March says that the matter demands attention by chemical engineers. Railroads, telephone companies and other large users are beginning to take up tie preservation and pole treatment, but the vast majority of wood users themselves have not given any consideration to the purchase of treated timber or the treatment of timber. *Chemical and Metallurgical Engineering,* a McGraw-Hill paper, warns purchasing agents and managers of corporations, as well as engineers, to make use of developments of creosoting and zinc chloride treatment, if they hope to escape the necessity of having to pay in the near future two or three times as much for wood supplies as would have been necessary had care been taken to use with economy those stocks which today are being consumed.

Twin City Company Active in Car Building

Four of the new type street cars built by the Light-Weight Noiseless Electric Street Car Company, Minneapolis, Minn., will be sent to Stillwater for use on that suburban line and five for use by the Duluth Street Railway, Duluth, Minn. They weigh 24,000 lb., as against 40,000 to 52,000 lb. for the old cars. The cars seat 44, are 36 ft. long and 9 ft. wide, have four 24-hp. motors, front entrance and rear exit and interlocked door and control.

George H. Tontrup Corporation Organizes

George H. Tontrup, who for the last 30 years has been identified with the business of general supplies for railways and manufacturers, has again taken up his activities after a short absence. The George H. Tontrup Corporation has been organized with offices at 953 Third Avenue, New York City, to handle the exclusive agency for the Acme Motor Coach Company, Cadillac, Mich., to the electric and steam railroads of the country. As president of this new organization Mr. Tontrup is prepared to negotiate with all transportation companies for Acme buses, both of the street car pay-enter type and the sedan or coach type. The George H. Tontrup Corporation will handle a complete line of supplies for electric and steam railways. It is direct factory representative for the Eastern district for the Grimm Metal Sign Corporation and the Silica Enamel Sign Company, manufacturers of metallic signs of every description. The company specializes on curb and sidewalk "bus stop" signs, and also all types of safety zone signs for railway service.

Westinghouse Air Brake Reports Satisfactory Operations

After providing from earnings for federal and other taxes, dividends and depreciation, the consolidated surplus of the Westinghouse Air Brake Company, Wilmerding, Pa., for the year 1924 increased from $10,360,865 to $11,611,087. H. H. Westinghouse, chairman, in his message to the stockholders states that although business was below normal in many lines during 1924, the operations proved fairly satisfactory and on Jan. 1, 1925, the company had practically the same value in unfilled orders on its books as at the beginning of 1924. The Canadian company's operations for the year were very satisfactory and reports recently received from the foreign companies indicate that the confidence restored by the adoption of the Dawes plan has improved their business outlook to a marked degree. The annual meeting of the stockholders was held at the general offices of the company, Wilmerding, on April 14.

Rolling Stock

Pittsburgh Railways, Pittsburgh, Pa., has placed an order for 103 new cars, comprising 83 safety city cars and twenty interurban cars. Specifications for the twenty interurban cars are very nearly the same as those for the city cars. The body weight is 1,000 lb. greater, making the total weight 40,000 lb. The seating capacity is two passengers fewer, being 50 when used as the forward car of a train and 54 when used as the second car. No fare boxes or registers are used. The seats are

Metal, Coal and Material Prices

Metals—New York	April 28, 1925
Copper, electrolytic, cents per lb	13.65
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.775
Zinc, cents per lb	7.32
Tin, Straits, cents per lb	56.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.90
Kansas screenings, Kansas City, net tons	2.75
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.50
Weatherproof wire base, N.Y., cents per lb.	18.25
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.00

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finished in plush and fabrikoid instead of rattan. Trolley retrievers are used in place of catchers, and pilots are supplied instead of the lifeguards used on the city cars. Detailed specifications of the 83 cars are given in the following table:

Number of cars ordered	83
Date order was placed	March, 1925
Date of delivery	Summer, 1925
Builder of car body	Standard Steel Car Co.
Type of car,	Low floor-multiple-unit, safety city
Seating capacity (in train)	52 as first car 56 as second car
Weights:	
Car body with equipment	22,000 lb.
Trucks	17,000 lb.
Total	39,000 lb.
Bolster centers, length	21 ft. 8 in.
Length over all	45 ft. 0 in.
Truck wheelbase	5 ft. 6 in.
Width over all	8 ft. 1½ in.
Height, rail to trolley base	10 ft. 10½ in.
Body	Steel
Interior trim	Cherry
Headlining	Haskelite
Roof	Monitor
Air brakes	Westinghouse
Axles	4-in. forged steel
Bumpers	Hedley anti-climber
Car signal system,	Electric Service Supplies Company
Car trimmings	Statuary bronze
Center and side bearings,	P. R. Co. center, Stucki, side
Conduits and junction boxes,	Crouse-Hinds sheet steel
Control	Westinghouse HL
Couplers	Westinghouse K-1
Curtain fixtures	Curtain Supply Company
Curtain material	Fabrikoid
Designation signs	Illuminated
Door-operating mechanism,	National Pneumatic air engines
Fare boxes	Cleveland No. 4
Gears and pinions	Nuttal, helical
Hand brakes	Peacock, staff and staffless
Heater equipment,	Consolidated Car Heating Co.
Headlights	Dayton, U. S.
Journal boxes	Symington
Lightning arresters	Westinghouse K-3
Motors	Four Westinghouse 514-P, inside hung
Registers	International Type 10
Sanders	Nichols-Lintern, air type
Sash fixtures	Dayton
Seats	Hale & Kilburn
Seating material	Rattan
Step treads	Feralun
Trolley catchers	Ideal
Trolley base	Westinghouse 13-E
Trucks	Arch bar
Ventilators	Peerless and Perry
Wheels	26-in. diam.

Marion & Bluffton Traction Company, Bluffton, Ind., will purchase two new interurban cars. Authority to issue $32,000 in notes has been asked of the Indiana Public Service Commission for this purpose.

United Traction Company, Albany, N. Y., will order 42 new buses following the truce reached between the company and the city over the matter of rates of fare.

Cleveland Railway, Cleveland, Ohio, recently placed orders for 60 buses to go into service on the Cleveland streets July 1. Thirty of the buses are of the six-wheel, double-deck type with a capacity of 62 passengers. The other 30 are White single-deckers on Kuhlman bodies with a capacity of 29 passengers each. The double-deck buses are to be used on two main lines paralleling existing street car lines, one going east from the Public Square and the other west. A number of the single-deck buses will be used as feeders to the railway.

Kansas City Railways, Kansas City, Mo., will open bids on May 9 on the three styles of bus to be used in the new service. The request for bids was for 61 buses, including 40 single-deck buses, sixteen double-deck buses and five special parlor cars.

Track and Line

Philadelphia, Pa.—Director Ehlers of the Department of Transit has awarded a contract to the Keystone State Construction Company for the third section of the Broad Street Subway between Stiles and Filbert Streets at its bid of $16,863,436 and limited the amount to include extra work to $17,700,000.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., will soon start reconstruction of its double-track line on Third Street from Chestnut Street to Galena Street. Completion of this improvement will give the company a new concrete structure for the full distance of the Third Street line, starting from the downtown section.

Portland Electric Company, Portland, Ore., has presented a proposal to the Multnomah County Commissioners by which the company plans to spend $120,000 in building a double track on the west side of the Greeley Street cut-off from Killingsworth Station to Stanton Street. This new track will connect with the Mississippi Avenue line.

Puget Sound Power & Light Company, Chehalis, Wash., plans to build a spur track into the fair grounds from the interurban line which runs near by. This will provide added transportation facilities for the Southwest Washington Fair, held at Chehalis, Wash., annually.

Seattle Municipal Railway, Seattle, Wash., plans to extend the 23d Avenue car line across the Montlake-Stadium bridge to the Stadium. Seattle banks recently purchased a $99,000 issue of 6 per cent railway utility bonds paying par and accrued interest for this construction.

Trade Notes

Brinard Sales & Construction Company, Inc., New York City, N. Y., railroad supply and equipment business, has been chartered at Albany with $10,000 capital. M. R. Briney, Brookhaven, L. I.; J. J. Hubbard, 55 South Seventh Street, Mount Vernon, N. Y., and Edward Shannahan, 582 Eleventh Street, Brookline, are the directors and subscribers. C. C. Cormany, 90 West Broadway, New York City, is attorney.

Industrial Works, Bay City, Mich., has announced that Lyle Marshall, former manager of the service department and later connected with the Chicago office, has been appointed district sales manager with new offices at 619 Dixie Terminal Building, Cincinnati, Ohio, also that James E. Shearer, assistant sales manager, has moved his headquarters from the home office to the New York office, 50 Church Street. George T. Sinks, in charge of the New York district, will remain in that position.

Chemical & Vacuum Machinery Company, Buffalo, N. Y., has announced that H. E. Neubauer, formerly assistant chief engineer of the Buffalo Foundry & Machine Company, later vice-president of O. S. Sleeper Company, Inc., has become associated with it as chief engineer.

Illinois Paving Brick Manufacturers Association Chicago, Ill., has announced that Lindsey E. Thompson has accepted a position as field engineer, with headquarters in Webster City. Until recently Mr. Thompson was sales manager of the National Sewer Pipe Company of Webster City, Iowa.

Gardiner & Lewis, Inc., New York, N. Y., has been succeeded by the Lewis Asphalt Engineering Corporation. The main offices of the concern—engineers and manufacturers specializing in protection against water and corrosion—continues at the old address, 30 Church Street, New York City. The change of name carries with it no change in ownership, management or policy, nor in the administrative and technical personnel. The officers of the company are: R. W. Lewis, president and treasurer; R. B. Reid, vice-president and general manager; J. W. Winkler, secretary. Frank Russell is sales manager at New York, C. W. Merriken at Chicago, and A. A. Gould at Cleveland.

General Electric Company, Schenectady, N. Y., paid in awards $39,531 to 3,244 employees during 1924 for suggestions which increased the efficiency of the company's operations. The suggestions ranged from those covering safety devices for the protection of workers to ideas on improved methods of manufacturing electrical apparatus, and the awards ranged from $1 to $1,000. In 1923, $22,988 was distributed to 1,752 employees and the highest award was $500. The awards may, at the option of the recipient, be paid in 8 per cent G. E. employees' securities corporation bonds.

Westinghouse Air Brake Company, Wilmerding, Pa., at the last annual meeting of its stockholders elected vice-president S. G. Down a member of the board of directors, filling a vacancy on the board created by the late Morris Rosenwald, Chicago. Mr. Down went with the company on Jan. 1, 1902, and the first duty assigned to him was that of an instructor on the instruction car. Since then he has advanced through the various positions of air brake inspector, mechanical expert, district engineer, assistant district manager, district manager, president of the Westinghouse Pacific Coast Brake Company and general sales manager, until he was elected vice-president in January, 1923, which position he now holds.

New Advertising Literature

General Railway Signal Company, Rochester, N. Y., has issued Bulletin No. 143, entitled "Signaling at the Age of Maturity," by Sedgwick N. Wight, commercial engineer. The subject matter in the bulletin was presented in the form of an address before the Signal Section of the American Railway Association on March 13, 1925. Because of the large number of requests for copies of the address it is presented in bulletin form.

Taylor Electric Truck Company, Troy, N. Y., has issued a small folder covering briefly its line of electric railway car trucks, and coil and elliptic springs for electric railway cars and buses.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 New York, Saturday, May 9, 1925 *Number* 19

Last Year's Operating Results Show Wide Differences

RESULTS of operation for the great bulk of American electric railways, compiled by the American Electric Railway Association and published in this paper last week, contain so much of real value that they should not be passed by without a careful and searching analysis. Considering the commercial and political situation during the year, the industry made a very creditable showing. It did virtually the same volume of business and at the same cost as in 1923, a much better year commercially.

Averages, however, do not mean much to the individual road. The question may well be raised as to what class of properties made the best relative showing for the year. Revenues naturally were greatest on city properties. These city companies included in the survey had operating revenues at the rate of $35,501 per mile of single track. Interurban lines, on the other hand, earned only $10,603 per mile. Even making allowance for the smaller investment and the easier operating conditions with lower cost, the showing is relatively poor. On a car-mile basis the earnings of the interurban properties showed up better. Gross revenues were 46.7 cents per car-mile on the city systems and 43.03 cents on the interurbans. Interurban passenger earnings were hard hit, and the balance was made up from freight.

Carrying the analysis somewhat farther, the best showing in the group of city systems was made by the medium-sized properties. Strangely enough, the largest city companies retained a smaller proportion of the gross revenue than did the middle-sized ones. This probably was due to the smaller effects of traffic congestion, permitting higher speeds. In the interurban field, on the contrary, only the companies in the group of largest gross earners were able to obtain any net income applicable to surplus or dividends.

Individual Attention to Earnings Problem Is Needed

CONDITIONS such as those pointed out in the above survey indicate that while the industry figures contain much general information, it is necessary to analyze each individual property if the industry is to be put in the best condition possible. For although the electric railways can be considered as a whole by the application of the law of averages, still each one presents an individual problem. Investors should not be asked to put their money into a proposition on the strength of a good general showing. Neither should they be scared off because in isolated cases the results are not satisfactory.

A step in the right direction was proposed by Executive Secretary J. W. Welsh in his last annual report, when he advocated community surveys of transportation. Knowledge of the transportation requirements in a community is essential if the local company is to render the most effective service, and incidentally is to obtain the largest return for its owners. The electric light and power industry and the telephone industry were pointed out by Mr. Welsh as examples of industries which have stimulated the public mind with the possibilities of extensions of service. This has been done as the result of a continual series of surveys through which the leaders have been in a position to know authoritatively what may be anticipated and to plan accordingly for the future. In like manner the electric railways can well afford to obtain similar information if they are to retain the prestige that they have enjoyed in the past and are to control local transportation in all its branches in the future.

Grand Rapids Car Competition Should Be Only a Beginning

NOT for many years has so much attention been paid to car construction as it is getting at the present time. While there has been a gradual development from the light single-truck car through the heavy double-truck car, back to the single-truck and now again the double-truck, there has been but little attempt to introduce radical innovations. Neither has there been a tendency to take the car-riding public into the confidence of the management and let the people be the judges of the vehicle. This plan, which is now being tried out in Grand Rapids, Mich., has much to commend it.

Competition in car design likewise shows a healthy condition. Few people inside or outside the industry believe that the ultimate in cars has been produced. Still, there has never before been a direct competition among three car builders to produce a vehicle which will vie with its competitors for public favor.

The conditions of the competition were simple. Light weight, noiselessness, comfort and an element of novelty to attract the public were the principal things aimed at. These are all desirable characteristics. In many cars, even recent ones, one or more of these things has been neglected, either to reduce cost, or because the management was blinded to the possibilities of the street car as a vehicle by the old fetish of "local conditions."

In the present competition the builders were given quite wide latitude. The three cars submitted are all double-truck, single-end, one-man, two-man designs. Those requirements of course limited the possibilities somewhat. But even so, there have been great opportunities for departure from existing standards. Specifications of the three cars show that advantage has been taken of many of these. Low floor, comfortable seats, good illumination, quick-acting band brakes, trucks and mechanical equipment designed to reduce noise, are but a few of the points given special attention by the builders.

Results will be watched with interest by other railway

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men. Whether or not the riding public chooses the best of the three cars, it will be an honest choice. Then, knowing what features meet with the approval of the people, the car builders will be in a position to go ahead and build cars that will be a still further advance over existing types. For only in this way can the best be brought out—and in the end the car rider will be judge of what is best.

Municipal Road Seeks to Sell Its Wares

SEATTLE has had a terrible time with its municipal railway. The supporting evidence is at hand at every turn, but it is not necessary here to marshal the distressing facts. All kinds of experiments have been tried in the way of fares, but to little or no avail. Things are better than they were some time ago, but they are still far from satisfactory. The road is as good as the limitations imposed upon Superintendent Henderson permit him to make it, but there is an excess of capacity which he desires to see fully used. So he is going in for advertising. In this he will be following the progressive moves of the Detroit Municipal Railway and of private companies. His avowed appeal will be to the owners of automobiles that they make greater use of the railway and desist from the practice of offering free rides. The street railway at Seattle is the people's road, but if they are conscious of that fact—and they ought to be—many of them still appear to be content to go their way ignoring it, except when the weather dictates another course or when their own private vehicles have been put out of the running because of the need for major or minor repairs. Mr. Henderson is sufficiently well informed to conduct the intended campaign intelligently and forcefully. In view of the selfish interest that the residents ought properly to have in their own road it will be interesting to see whether the measure of success that attends his effort is greater than that which has attended similar efforts on the part of privately operated companies to induce greater riding.

Group Conference Educational Plan Widely Applicable

PRACTICALLY six hundred certificates were awarded to employees who attended the series of departmental group conferences given by the Boston Elevated Railway this season.

This event, chronicled in an unobtrusive news note, marks the completion of a program which grew out of a definite need felt by the employees of the Boston Elevated for expert information regarding their everyday work. Planned at first for a small expected registration, the group conference idea so appealed to the men and women that more than a thousand enrolled in one or more of the five groups organized. Of these the number who completed the work is creditable when the exigencies of railway duties through a New England winter are considered. Credit for this result must be given to Edward Dana, general manager, and his department heads. Their vision and persistence overcame all difficulties. What the Elevated has done other railways can do, and they are urged to try the so-called "group conference plan" unless they have something better.

Care Should Be Taken in the Use of Buses

EVEN though numerous electric railways are constantly increasing motor bus operations there are many that have not as yet taken to buses as a means of providing transportation either as feeders to their street railway systems or as independent lines. There are still others which, while already operating buses, have not extended their use. Some of these companies may justly be criticised for not developing bus operation, although others have shown good judgment in refraining from or limiting their use. Bus lines should not be started in communities that are adequately served with street car tracks, nor should lines be started in territories not likely in the near future to be built up to a point warranting the service. In other words, good judgment should not be forgotten simply because of a desire to operate buses.

The street railway manager who several years ago recognized the possibilities of the bus and realized that the street car was not the only means of transportation was ahead of the one who could see the bus only as an enemy. Many of the latter have since become users of the motor bus. One sometimes wonders if perhaps they are not now becoming over-enthusiastic and are operating buses where there is no real justification, just to demonstrate their conversion. Few companies are finding their bus operations profitable in themselves. In many instances the balance of the system cannot afford to carry such an additional burden, although in some cases the bus may be used to give service with less loss than that occasioned with rail operation in non-productive territory.

When a bus line is started the public should have confidence in its continuance despite its ease of discontinuance. For that reason as much care should be exercised in starting a bus line as would be taken in preparation for a rail extension. Only through the establishment of such confidence will the public show a preference for the bus line proposed by a street railway in lieu of actual track extension or the bus proposal of an independent competitor. The ease with which a bus line can be discontinued has in some instances caused real estate operators to object to certain desirable trackage abandonments and the substitution therefor of buses, even though the service would be improved thereby. Rails and a trolley wire are tangible evidences of transportation facilities. The public must be taught that a street railway company's bus line is equally permanent. Therefore, it behooves the industry to be judicious in the selection of its bus routes so that they will be permanent and obtain public confidence.

The street railway is the backbone of transportation. Whenever possible, from a financial and operating viewpoint, it is best that service be furnished by rail, for it is the recognized means of mass transportation. The bus has shown that it can be part of a unified transportation system whether operated as feeder, independent line, or to provide a special service for those who prefer to pay a higher fare and obtain conditions not available in street cars. The demand for buses should not beguile the street railway operator into thinking it is the only transportation vehicle the public wants. The bus has its place. It is filling it admirably, and is here to stay. The mistake should not be made of thinking that a bus line must be started every time there is a petition for one.

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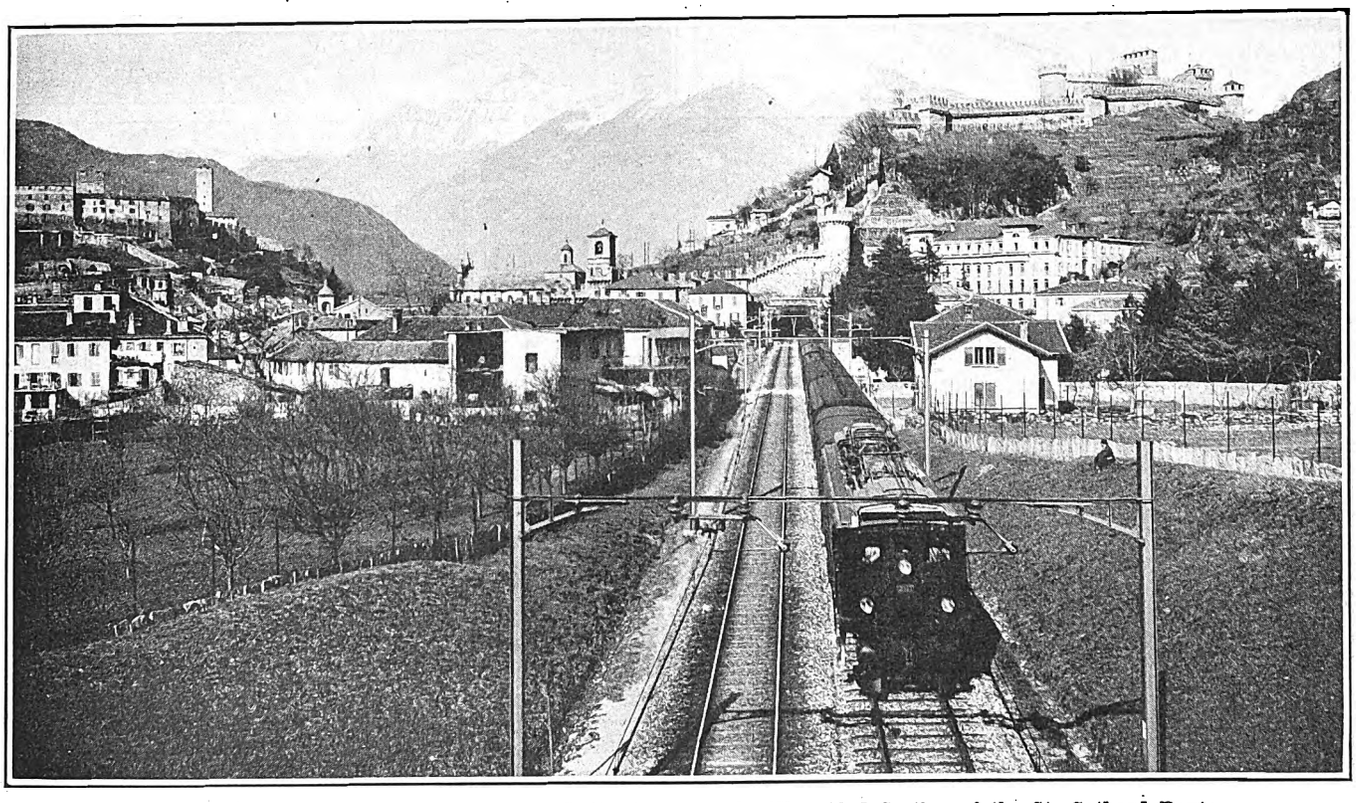
Electrification of Swiss Federal Railways Progressing Rapidly

By the End of 1928 it Is Planned to Complete 973 Miles, Comprising Nearly All the Main Lines—Ultimately the Entire System of 1,802 Miles Will Be Electrified—Single-Phase Alternating Current at 15,000 Volts Will Be Used for All Except One Short Section



Bellinzona, in the Mountains of Southern Switzerland, on the Electrified Section of the St. Gothard Route

IN NO other country has the development of railroad electrification progressed as rapidly in recent years as in Switzerland. Shortly before the World War it was decided to electrify the entire railroad system of the country. The motives behind this scheme were threefold; to reduce operating costs, to render the railroads independent of a foreign coal supply, and to aid the unemployment situation. Construction work, however, was considerably delayed by the war.

Originally it was planned to complete the electrification of 624 miles by the end of 1928, and to continue for some 30 years at the rate of about 60 miles a year until the entire system of 1,802 miles was electrified. In the early part of 1923, however, the program of 1918 was changed to hasten the progress of the work, as told in ELECTRIC RAILWAY JOURNAL of April 7 that year. Under the new plan it is expected that 973 miles, comprising nearly all the main lines, will be electrified within the next three years. The total cost of the undertaking is estimated at about 760,000,000 Swiss francs.* Of this sum 700,000,000 francs will be supplied by the Swiss Federal Railways, and 60,000,000 francs will be contributed by the government. Although in Switzerland the railway is a state enterprise, it keeps separate accounts.

*At present a Swiss franc is worth 18.34 cents.

Distribution of expenditures is expected to be about as follows:

	Per Cent
Hydro-electric power plants	21.5
Transmission lines	8.0
Substations	8.5
Catenary construction	18.0
Rolling stock	30.0
Miscellaneous	14.0
	100.0

Two principal railway routes cross Switzerland, both taking their names from important tunnels through which they pass. The Simplon route is the main line from Paris to the Near East, and passes through Geneva, Lausanne, Sion, and the Simplon Tunnel into Italy. Between Sion and Iselle in Italy 47 miles of this line have been operated by electricity for several years. Three-phase current at 3,300 volts 16⅔ cycles is used. Electrification as far as Geneva is at present in progress.

Running north and south is the St. Gothard route, which goes down from Basel, Lucerne and Zurich into Italy, passing through the St. Gothard tunnel. Electrification of practically all of this line, referred to in ELECTRIC RAILWAY JOURNAL for Sept. 20, 1924, has now been completed. On this route and on the new sections of the Simplon route single-phase current at 15,000

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volts 16⅔ cycles is used. This has been adopted as standard for the entire system and it is planned to change over the line between Sion and Brigue, leaving only the 13.6-mile section of the Simplon Tunnel operated with three-phase current.

Power is produced in the generating stations of Ritom-Amsteg and Barberine-Vernayaz. One plant of each group works chiefly during summer and one during the winter. These complementary units are connected by 60,000-volt transmission lines. The first pair supply power for the St. Gothard line while the second pair serve the Simplon route and other lines in western Switzerland.

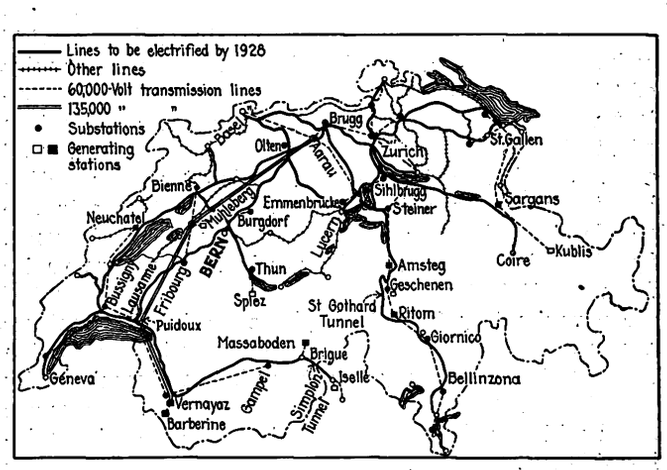
The power station at Amsteg is near the northern entrance of the St. Gothard Tunnel, and a second at Piotta is some 5 miles beyond the southern entrance. At Amsteg advantage is taken of the fall of the river Reuss from the Pfaffensprung, about 900 ft. above the power station. The gorge through which the river runs has been closed by a curved dam to form a reservoir, and a tunnel conveys the water to the pipe line which extends to the generating station. Amsteg is in use mainly during the summer, while Piotta station, which utilizes the water of Lake Ritom and the Fossbach Fall, is used chiefly in winter. During the summer water is allowed to accumulate in the lake, which is about 2,950 ft. above the power house. The capacity of the lake as a reservoir has been increased by the construction of a dam across one corner, as shown in an accompanying illustration.

To furnish power for the electrified Simplon line and the government railway system in the west, two large generating stations utilizing the water of Lake Barberine have been built. These are known as the Barberine and Vernayaz plants, and will be operated in a manner similar to the Amsteg-Ritom group. The Vernayaz-Barberine combination, however, is more fortunately placed than the other combination because the water of the Barberine lake is utilized in the two generating stations one after the other. It is estimated that the Barberine-Vernayaz group will be able to generate at a cost of 3.35 centimes per kilowatt-hour.

These two groups of hydro-electric generating stations of Swiss Federal Railways will be able to produce about 420,000,000 kw.-hr. per year. Except in especially dry years the Ritom station should be able to supply 40,000,000 kw.-hr. Amsteg station has been designed for an annual output of 150,000,000 kw.-hr., of which at least 55,000,000 kw.-hr. can be supplied during the winter. The two stations together, therefore, have a capacity of 190,000,000 kw.-hr. Barberine generating station is capable of supplying about 60,000,000 kw.-hr., of which 80 per cent will ordinarily be supplied in winter. At least 170,000,000 kw.-hr. will be produced at Vernayaz, of which 105,000,000 kw.-hr. will be generated from May to October.

Between Brigue and Iselle, the section which is to remain permanently three-phase will be supplied with power by the small Massaboden power station of the Swiss Federal Railways and by the Dynamo Company of Milan. In the easterly part of Switzerland the railway will continue to be supplied with power from the generating station at Kublis, utilizing the Grisons water power. In the vicinity of Bern the Spiez generating station will continue to supply power to the Bern-Scherzligen section.

Later the single-phase current of the Federal Railways is to be connected with the three-phase system of the Bernese water-power generating station by means of rotary converters installed in the Muhleberg station. It is proposed that the converter group here shall work both ways for transforming three-phase



Plans for the Electrification of the Swiss Federal Railways Call for the Completion of 973 Miles by the End of 1928 and Ultimately the Electrification of the Entire System

power purchased by the railway into single-phase current, or for transforming excess single-phase current into three-phase for commercial use. In order to insure the efficient use of its hydro-electric generating station when the traffic on the railway is not sufficiently great to require the entire amount of energy available, a three-phase generator of 9,000-kw. capacity has been installed at Amsteg. A similar installation is planned for Vernayaz. These will permit the railway to dispose of excess power to private enterprises.

Transmission lines connecting the generating stations to the substations are carried on iron towers alongside the railway line. In general the 60,000-volt lines use copper conductors, while for the 135,000-volt line from Vernayaz to Rupperswil it is planned to use aluminum steel conductors. Ritom and Amsteg stations are connected by underground transmission cables working at 30,000 volts. Cables are carried through the numerous tunnels of the St. Gothard line and operate in an entirely satisfactory manner.

SPECIFICATIONS OF SINGLE-PHASE LOCOMOTIVES

Series numbers	10201-27	10301-46	10401-50	12303-12	12313-42	12501-06	14251-83	16301-02
Number of vehicles	27	46	50	10	30	6	33	2
Number of motors	3 twin	3	2	4	4	4 twin	4	1
Number of driving axles	3	3	3	4	4	4	6	3
Number of carrying axles	2	3	3	2	2	3	2	1
Nature of drive	Individual gear	Individual gear	Gear and rod	Gear and rod	Gear and rod	Individual gear	Gear and rod	Gear and rod
Gear ratio	1-5	1-2.57	1-2.224	1-3.5	1-3.195	1-5.7	1-4.03	1-3.75
Total weight, metric-tons	81.1	92.3	98.5	106.5	111.4	110.5	128.0	48.8
Length over buffers	40 ft. 2⅜ in.	48 ft. 3 in.	46 ft. 2⅜ in.	54 ft. 2 in.	54 ft. 2in.	53 ft. 3½ in.	63 ft. 8 in.	32 ft. 2⅜ in
Wheelbase	30 ft. 6 in.	35 ft. 1¼ in.	35 ft. 1¼ in.	44 ft. 3½ in.	44 ft. 3½ in.	44 ft. 9 in.	54 ft. 2 in.	19 ft. 3½ in.
Diameter of driving wheels	5 ft. 3⅜ in.	5 ft. 3⅜ in.	5 ft. 3⅜ in.	5 ft. ¼ in.	5 ft. ¼ in.	5 ft. 3⅜ in.	4 ft. 5½ in.	3 ft. 5 in.
Voltage of motors	660	505	380	505	505	660	400	505
Tractive effort, pounds	16,980	18,400	18,300	20,170	23,370	25,350	37,030	12,680
Maximum speed, m.p.h	56	56	56	46.6	46.6	46.6	40.4	24.9

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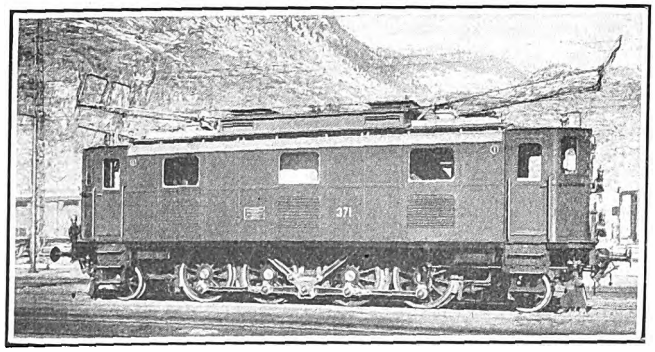
There are in all 25 substations, located as shown on the accompanying map. Transformers are of two types, 3,000-kw. and 5,000-kw. capacity, having half-hour overload capacities of 4,500 kva. or 7,500 kva. respectively. All cables leaving the substations are controlled by hand-operated line switches connected in groups to busbars and fed through automatic cutouts. Feeder cutouts are shunted by a resistance which enables the insulation of the lines to be checked after cutting out. Inclosed substations have been installed on the St. Gothard line, but more recently the open-air type has been built. Energy consumption of the railways in 1923 was 62.6 watt-hours per ton-mile measured on the 15,000-volt bus in the power house and 56.4 watt-hours per ton-mile measured at the substation bus.

Simple catenary suspension is used for the trolley wire at a height varying from 18 ft. to 21 ft. 8 in. above the rail. A single copper contact wire of 0.166 sq.in. cross-section is used with a steel messenger wire of 0.077 sq.in. cross-section. In tunnels the same contact wire is used, but the messenger is a combination of steel and copper with 0.087 sq.in. cross-sectional area. On sidings the contact wire is of smaller section but the messenger wire is the same. Supports are simple iron bridges or posts with bracket arms. Spacing of supports for the overhead structure varies from 200 to 325 ft.

Approximately 200 single-phase electric locomotives are in operation or on order. This is in the proportion of 90 electrics for every 100 steam locomotives formerly operated. Oil-cooled transformers are used. These are fitted with supplementary collectors capable of supplying 450 kw. at 800 to 1,000 volts for electric heating of trains. Through trains containing foreign rolling stock are heated by steam furnished by special heating cars coupled on to the trains.

Principal details of the locomotives are shown in the accompanying table. Those designed for operation on the St. Gothard route, where the grades are heavy and



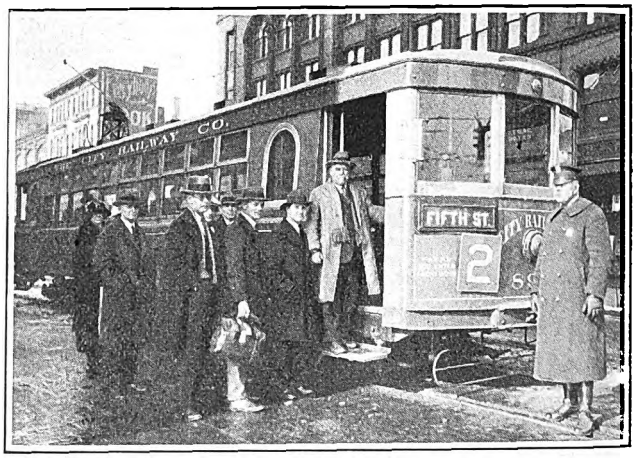
Type of Three-Phase Electric Locomotive Used on the International Section Between Brigue and Iselle, Including the Simplon Tunnel

long, are equipped with electric brakes, some of the regenerative type and some resistance type. A small number of multiple-unit cars have also been built. Expenditures for rolling stock up to the end of 1928 are expected to amount to approximately 210,000,000 francs or 30 per cent of the cost of electrification.

Electric operation of the Swiss Federal Railways has so far given entire satisfaction. Figures for operations to date cannot be regarded as final because the work of construction is still in progress. Not the least of the advantages of electrification, however, is the public good will which has resulted therefrom.

Monel Metal Side Sheets Stand Up in Dayton

SIDE sheets and dash made of monel metal have been entirely successful after two years of service on the experimental car built for the City Railway of Dayton, Ohio, by the Cincinnati Car Company. No paint or varnish is used on the metal. The striping and lettering shown in the accompanying illustration are aluminum, and set off well from the natural color of the metal. The monel metal, which is a natural commercial alloy of copper and nickel, assumes a pleasing blue-gray color which gives the car a very attractive appearance.



After More Than Two Years of Service, This Sample Car of the City Railway in Dayton Shows the Appearance of the Monel Metal Used for the Exterior to Eliminate the Need for Paint

The saving in cost of paint is, of course, a decided advantage. It is estimated that this saving has already more than paid the total additional cost of the monel over ordinary sheet steel. The practice has been simply to wash the car periodically, as would be done in the case of paint. When the metal surface is wiped off after this treatment it assumes its natural bluish color, with no evidence of tarnish or streaking.

On the sample car the letterboard and the vestibule posts are painted. These, together with the sash frames, are the only parts on the exterior which have required any additional attention except washing.

Progress in Safety Matters

SEVERAL articles relating to safety methods on electric railways appear in the May issue of the *National Safety News*. One of these is a contributed article by A. W. Koehler, director of safety New York State Railways, Rochester, N. Y., descriptive of the precautions adopted on the two long interurban divisions of the New York State Railways, Rochester lines, to protect grade crossings. Another article treats of safety methods of the United Railways & Electric Company of Baltimore, including the organization of the safety committee and selection and training of men for the transportation department. A car of the West Penn Railways, described in a third article, has been equipped with safety features standard on the line, for the purpose of teaching the public the means adopted by the company to reduce accidents. There is also an account of the receipt of the Rice safety award for 1924 by the Beaver Valley Traction Company of New Brighton, Pa.

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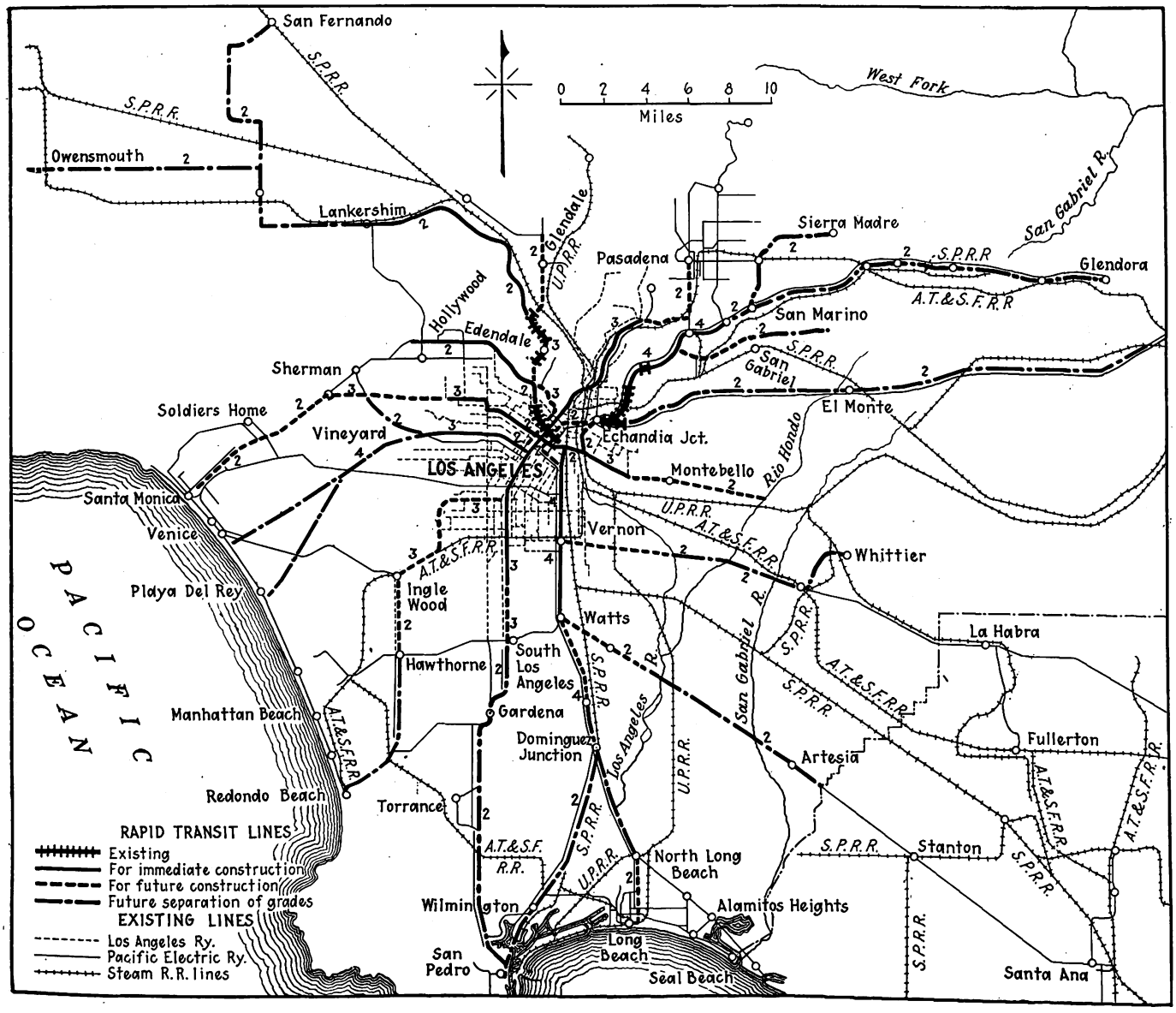
Comprehensive Transportation Plan for Los Angeles

Report to City Council by Kelker, De Leuw & Company Recommends Rapid Transit Construction and Co-ordinated Operation of All Transportation Facilities Under One Management — Special Assessment Against Benefited Property Advocated for Financing Construction Cost

DEVELOPMENT of a comprehensive unified transportation system consisting of a combination of rapid transit, interurban street railway and motor bus lines is the subject of a plan that has been presented to the Council of the city of Los Angeles and the Board of Supervisors of Los Angeles County by Kelker, De Leuw & Company of Chicago. This report, in the main, proposes a consolidation of all local transportation facilities in Los Angeles under a single operating management and outlines a general local transportation system designed ultimately to meet the requirements of a city of 3,000,000 population. To give adequate transportation under existing conditions, rapid transit construction, together with improvements of interurban lines and extensions of street railway and motor bus facilities, is recommended for an immediate program. Co-ordination of all these facilities under one management is advocated as a necessary step. These lines are intended to form the nucleus of a more comprehensive system recommended for future requirements.

A low rate of fare is recommended. Special assessment against the benefited property is proposed as an equitable method for financing rapid transit construc-



Transportation Plan Developed for the Metropolitan District of Los Angeles. Figures Indicate Number of Tracks

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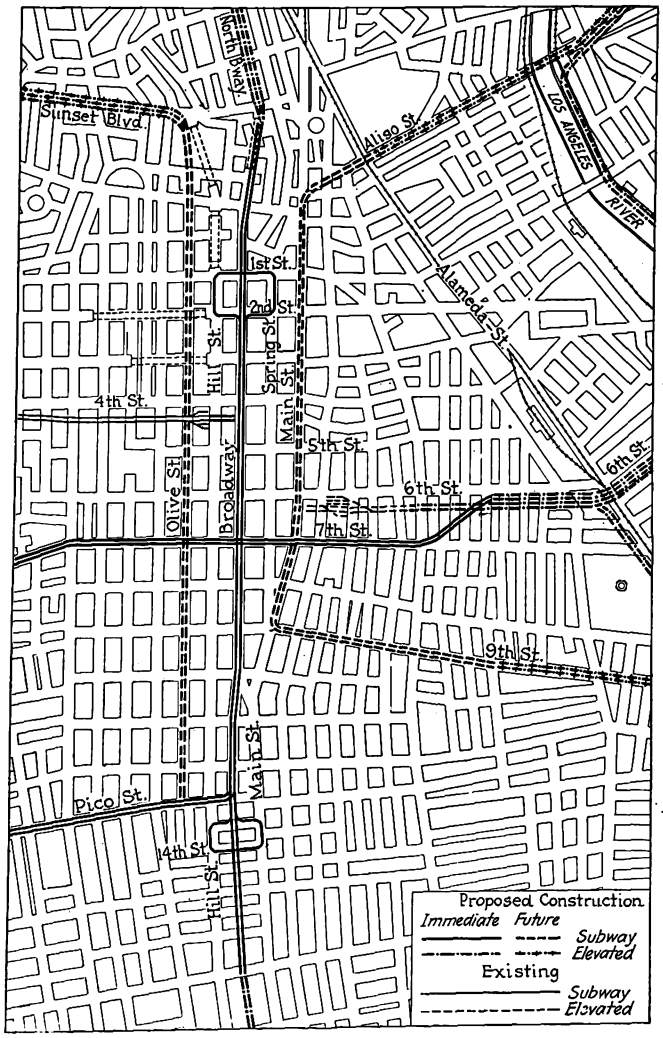
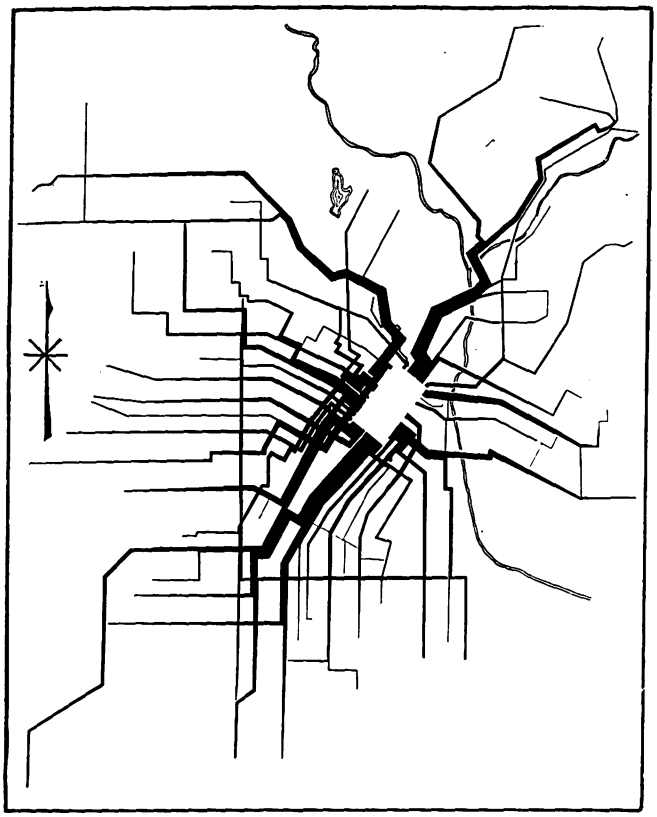


Both Elevated and Subway Lines Are Proposed for the Congested District



Passengers Outbound During the Afternoon Rush on a Typical Week Day

tion without placing an additional burden on the car rider. Where rapid transit construction is to be undertaken for existing interurban lines of the Pacific Electric Company, it is recommended that the savings effected in operating costs through increased speed in congested territory be capitalized as the interurban company's share of the construction costs. The report also proposes that an equitable portion of the construction costs be assumed by the community at large as a general benefit. This, however, would be a comparatively small part of the total.

In general, modern elevated structures are advocated for rapid transit lines except in certain highly developed locations where subways are considered necessary. Where property owners object to the modern type of elevated construction proposed the report suggests that the additional cost of subway construction, if this is demanded, be borne largely by special assessment against the property benefited.

For the purpose of studying the present and future transportation requirements of Los Angeles the present corporate limits of the city were disregarded. Instead the urban territory, comprising the developed area within a circle having its center in the business district, was treated as a transportation unit. In some instances this includes communities at present outside the corporate limits of the city and excludes large undeveloped areas that are included within the city limits.

A general summary of the estimated cost of construction is given in Table I.

TABLE I—SUMMARY OF ESTIMATES OF COST FOR IMMEDIATE CONSTRUCTION

(A)	Rapid transit lines:	
	1. Moneta-Broadway-Pasadena Avenue	$33,043,000
	2. Hollywood-Vineyard	31,359,000
	3. San Fernando Valley	4,678,000
	4. Third-Seventh-Whittier Boulevard	28,951,000
(B)	Surface lines	4,006,000
(C)	Equipment—Cars, buses, substations, shops, yards, etc.	18,200,000
(D)	Pacific Electric Railway expansion	13,148,000
	Total	$133,385,000

TABLE II—STATEMENT OF TRACK MILEAGE OF THE COMPREHENSIVE TRANSPORTATION SYSTEM*

	Miles of Single Track				
	Existing or Under Construction	For Immediate Construction	For Future Construction	Total Construction	Unified System Totals
Subways and tunnels	1.8	26.1	15.4	41.5	43.3
Elevated railroads and depressed track	14.5	85.3	155.0	240.3	254.8
Total rapid transit lines	16.3	111.4	170.4	281.8	298.1
Street railways	572.3	41.6	62.7	104.3	676.6
Total mileage	588.6	153.0	233.1	386.1	974.7

* Within an area circumscribed by a circle having a radius of 8 miles from Seventh Street and Broadway.

In addition to the above, the program of future construction recommended is estimated to cost $190,000,000 at present price levels.

The track expansion proposed is indicated in Table II. The following rapid transit construction program is recommended for the initial period:

Moneta-Broadway-Pasadena Avenue rapid transit line extending through the city from Manchester Avenue on the south to Avenue 64 on the north. This line is to consist of an elevated railroad with the exception of the section between Washington Street and Sunset Boulevard, where a subway is recommended.

Hollywood-Vineyard rapid transit line connecting the north and northwest with the west and southwest sections of the city, following approximately the present Hollywood-Vineyard route of the Pacific Electric Railway. This line will consist of an elevated railroad and subway in Pico Street, the Broadway subway, the Hollywood tunnel and an elevated railroad on Glendale and Sunset Boulevard, with a subway in Hollywood Boulevard. Physical connec-

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tions are to be made near Vineyard Junction with the Venice and Sawtelle lines, and at Glendale Boulevard and Montrose Street with the Glendale line.

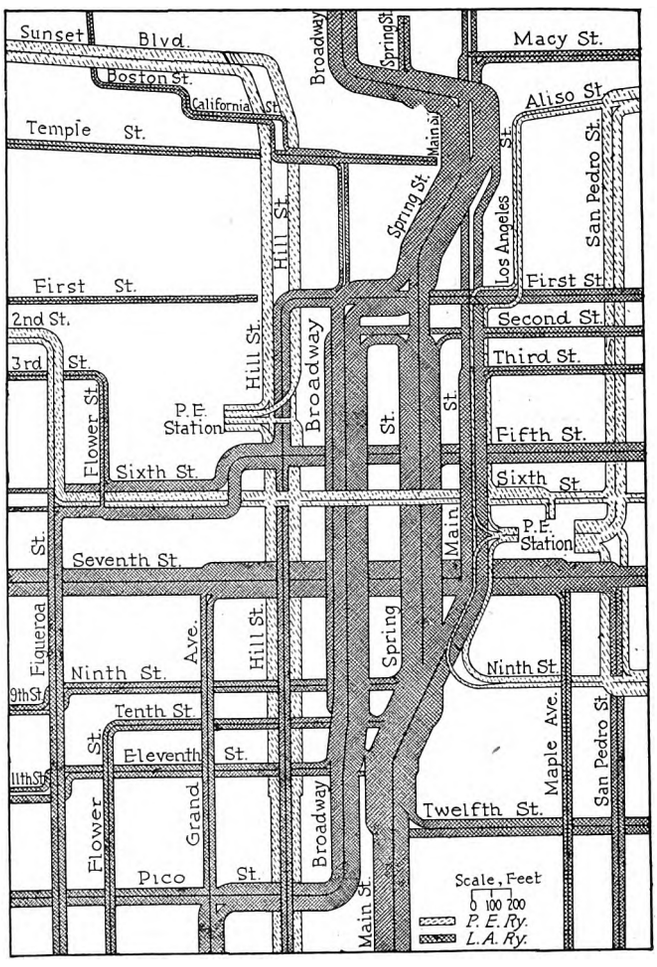
San Fernando Valley line, to reduce the traveling time between the central business district and the San Fernando Valley. At the present time an interurban service is furnished in the San Fernando Valley by trains operating through the Cahuenga Pass. The new line will extend northwesterly on private right-of-way from a connection with the existing track of the Glendale line of the Pacific Electric Railway just west of the Los Angeles River to the Burbank-Chatsworth branch of the Southern Pacific Railroad, and then westerly to a connection with the existing Pacific Electric Railway line at Lankershim. It is to consist of an elevated railroad between Glendale Boulevard and Los Feliz Boulevard and a rapid transit railroad at grade from Los Feliz Boulevard to Lankershim. Elevated construction is to be used at important streets in order to eliminate grade crossings.

Third-Seventh-Whittier Boulevard rapid transit line extending across the city from Larchmont Boulevard on the west to Indiana Street on the east. This line is to consist of a subway in Third Street, Vermont Avenue, West and East Seventh Streets; also private right-of-way from Larchmont Boulevard to Stanford Avenue, and an elevated railroad along private right-of-way and Whittier Boulevard from Stanford Avenue easterly to Indiana Street.

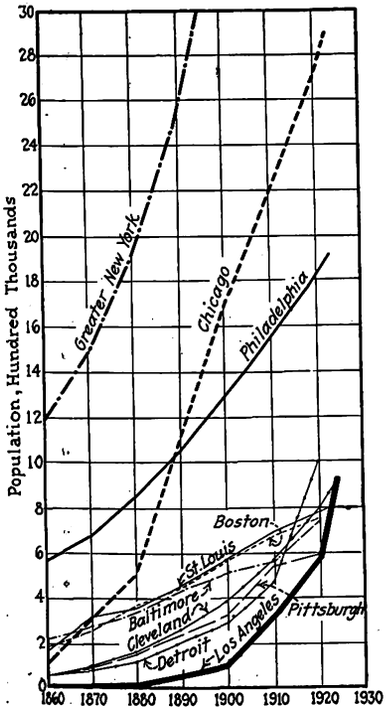
To provide an adequate system of feeders to the rapid transit line and at the same time to extend the local service it is recommended that the following surface line extensions be made.

Street	From	To
Downey Road	Ninth Street	Fifty-fifth Street
Euclid Avenue ...	Whittier Boulevard.	Ninth Street
Fifty-fifth Street .	Central Avenue.....	Downey Road
Fifty-fourth Street	Moneta Avenue	San Pedro Street
Fifty-fourth Street	South Park Avenue.	Central Avenue
Florence Avenue .	Western Avenue ...	Pacific Boulevard
Marengo Street ..	Daly Street	Soto Street
Melrose Avenue ..	Larchmont Blvd. ..	Vine Street
Ninth Street	Hooper Avenue	Downey Road
Soto Street	Marengo Street ...	Wabash Avenue
Vermont Avenue .	Monroe Street	Los Feliz Blvd.
Vernon Avenue ..	Angeles Mesa Drive	Arlington Avenue
Vernon Avenue ..	Dalton Avenue	Vermont Avenue
Vernon Avenue ..	Pacific Boulevard ..	Downey Road
Vine Street	Melrose Avenue ...	Hollywood Blvd.
Wabash Avenue ..	Soto Street	Evergreen Avenue

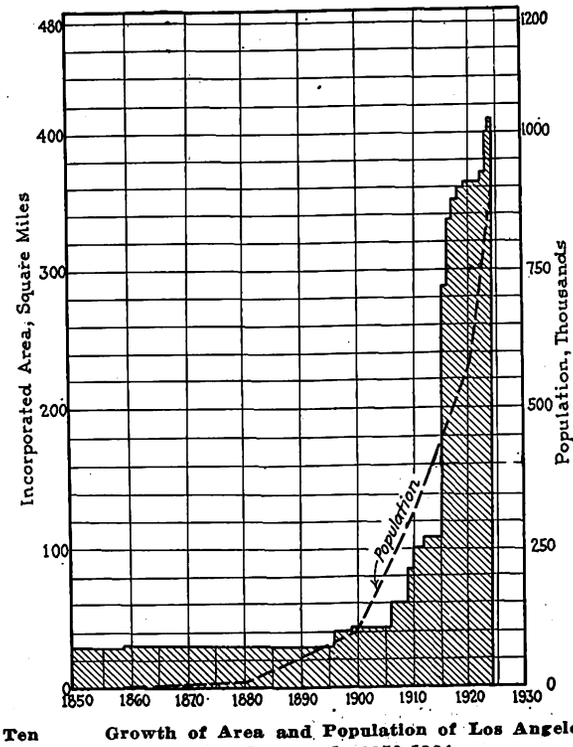
Additional bus lines are recommended. These include a bus route on Plymouth Boulevard, Eighth Street, Norton, Sixth and Seventh Avenues from Third Street to Exposition Boulevard. Another bus route is recommended for Manchester Avenue, extending from Western Avenue to Alameda Street. Still another route is proposed for Western Avenue, Los Feliz Boulevard,



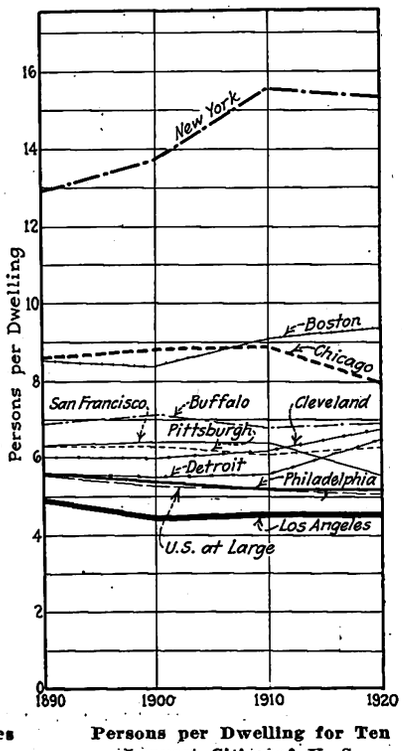
Car-Flow Diagram for the Congested District During the Rush Hour



Comparative Growth of Population of Ten Largest American Cities, 1860-1924



Growth of Area and Population of Los Angeles Compared, 1850-1924



Persons per Dwelling for Ten Largest Cities of U. S.

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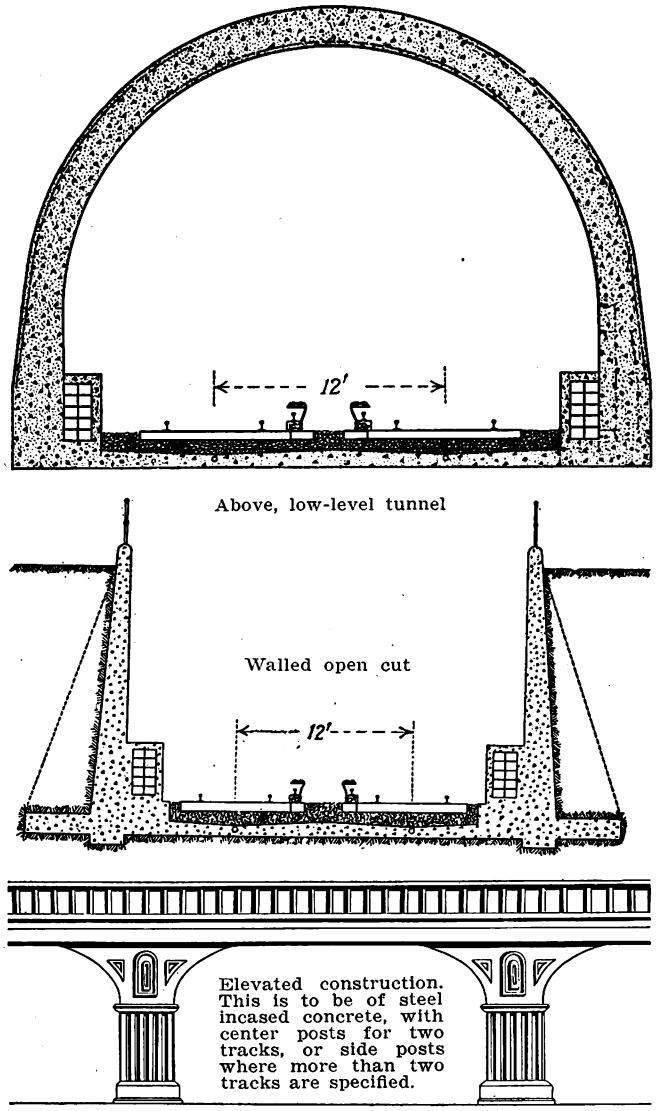

Types of Rapid Transit Construction Recommended for Los Angeles, in Addition to High-Level Subways

Central Avenue in Glendale, Colorado Avenue and Colorado Street, from Franklin Avenue to Fair Oaks Avenue in Pasadena.

Since the freight traffic on the lines of the Pacific Electric Railway as they exist on the east and south sides of the city prevents their co-ordination with the proposed rapid transit system, it is recommended that the Pacific Electric Railway make a number of improvements, some of which are now in contemplation by this company. These improvements include construction of a terminal elevated railroad easterly from a connection with the Main Street station elevated structure to a point just east of the Los Angeles River and then northerly paralleling the river to Aliso Street. A branch is to extend southerly from a point near Seventh and Alameda Streets to a connection with the Watts line near Fourteenth Street. The elevation of the existing four-track Watts line from Ninth Street to Manchester Avenue and the construction of two additional tracks on a short section of the Pasadena Short Line are also recommended.

All of the foregoing proposals are included in the program for immediate construction. The suggested future extensions of the system are shown on the accompanying map.

Under the new city charter of Los Angeles, the municipality is required to adopt a comprehensive elevated railroad and subway plan before any construction is authorized. This provision was made to avoid wasteful construction and to foster the development of a broad transportation policy and plan. The present report was prepared to supply this plan. It is based upon certain underlying principles which are summarized as follows:

Future orderly development of Los Angeles requires the construction of rapid transit lines and the extension and expansion of other transportation facilities.

If the city's unequaled position, when compared with other large cities with respect to the number of families per dwelling, is to be maintained, it must continue to spread, and this spreading must be accomplished only by providing rapid transportation at a reasonable rate of fare.

Payment by the car rider of a fare sufficient to support all of the capital needed for rapid transit construction will require that the fare must either be substantially increased or the rapid transit system must be quite limited.

By dividing the cost of transportation development proportionally between car riders, benefited property and the public at large, a comprehensive construction program can be undertaken and equitably financed.

Only by the adoption of a comprehensive plan can a sound and economical construction program be prepared.

The unification and operation by a single management of all the public transportation services within the urban area (an area circumscribed by a circle having a radius of approximately 6 miles from the central business area) is essential to first-class service.

Existing facilities should be utilized in the greatest measure consistent with the development of the transportation system.

The services rendered by rapid transit, interurban, street railway and motor bus lines should be co-ordinated, in so far as this is practicable.

Extension and expansion of street railway and bus lines should include crosstown lines which will make the rapid transit route easily accessible.

Grade separation at important highway crossings on the high-speed interurban lines in the outlying areas should accompany the construction of the proposed rapid transit lines, and additional highway crossings should not exceed the minimum number required to meet the public needs.

The alignment of principal thoroughfares should be improved wherever possible by eliminating offsets. The radius of curbed corners should be increased in order to facilitate the movement of all street traffic.

In discussing the relative merits of subway and elevated structures for rapid transit lines, the report points out that elevated lines provide the facilities for travel in natural light and open air and are particularly adapted to the climate of Los Angeles. Attention is called to the vast improvement in the design of elevated structures since the first elevated railroads were built in Eastern cities. The recent construction in Philadelphia is cited as an example of the attractive appearance which may be incorporated in the design of such elevated structures. Based upon considerations of noise, street traffic obstruction and the appearance of a city, subways are held to be unquestionably superior to elevated railroads, but it is maintained that the service which can be provided in subways is no better than that which can be provided on elevated railroads. The report points out that the least expensive type of subway is from two to four times more costly than an elevated structure, and that the type of structure to be finally adopted must necessarily depend in a large measure upon financial limitations.

Comparisons are drawn indicating the relative advantages and disadvantages of various types of sub-surface and elevated structures for rapid transit lines. Construction cost estimates of the various types of structures considered are shown in Table III.

Illustrations of several types of sub-surface and elevated structures considered are shown. Estimates of the cost of two-track high-level subway construction

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TABLE III—COMPARATIVE ESTIMATES OF COST
Double Track Rapid Transit Structures, Including Two Stations per Mile and Excluding Right-of-Way

	Cost per Mile of Road
Sub-surface structures	
Depressed track (with retaining walls)	$3,500,000
High-level subway (downtown district)	4,600,000
High-level subway (residential district)	4,150,000
Subway (tunnel construction between stations)	3,500,000
Elevated structures	
Solid fill elevated (with retaining walls)	1,500,000
Steel incased in concrete	
Ballasted deck, double columns at curb	1,600,000
Ballasted deck, double columns in roadway	1,500,000
Steel	
Ballasted deck, double columns at curb	1,250,000
Ballasted deck, double columns in roadway	1,200,000
Ballasted deck, single column in roadway	1,350,000
Open deck, double columns at curb*	850,000
Open deck, double columns in roadway*	800,000

* None recommended.

were prepared, one for the downtown district and the other for the residential district. These respective costs are $4,600,000 and $4,150,000 per mile. The high-level subway is the most expensive of all the structures considered in the report, and for this reason is recommended only for use in the downtown area where proximity to the surface of the street and consequent short stairways to station platforms are an advantage. The shales which underlie most of the hilly territory in Los Angeles were found to be well adapted to low-level subway construction by tunneling. It was concluded that the tunneling method of construction is quite practicable and will provide the most economical underground construction over a large part of the proposed subway route. This method of underground construction is particularly recommended for the residential districts. The plan is to have track grade come close to the surface of the ground near stations, at which points the high-level subway structure will be used. Estimates of cost based upon this combination of tunnel and high-level subway construction show that a two-track subway can be constructed for $3,500,000 per mile, or $650,000 less than the cost of high-level subway construction throughout. Tunnel construction is considered to have a further advantage over high-level subways in that there is but little interference with the utilities and drainage structures in the street and but very slight interference with street traffic during construction.

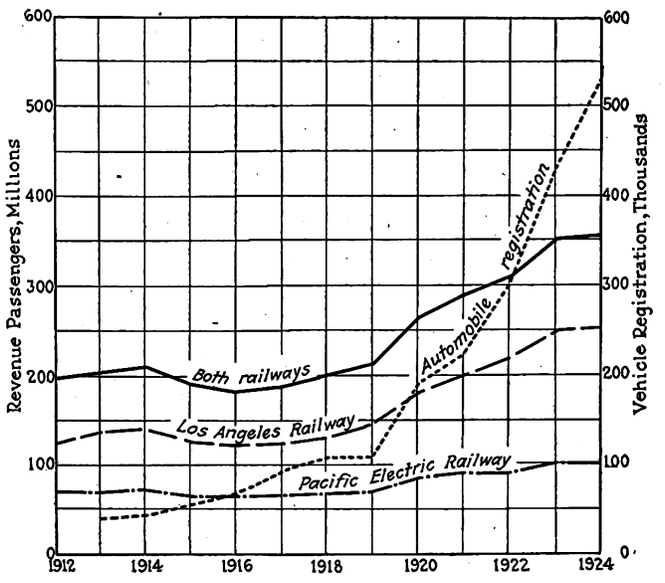
Stations on the rapid transit lines have been tentatively located on a general basis of ¼ mile spacing in the heavy loading zone of the central business district, and ½ mile spacing in the intermediate and outlying districts.

Careful studies of the riding habits and growth in population of Los Angeles were compared with experience in other cities in order to derive the probable income of the complete transportation system. The estimated total investment after the completion of the immediate construction program is shown in Table IV. This also shows the estimated annual interest charges, assuming 7 per cent cost for new capital.

It is assumed that about ten years will be required

TABLE IV—ESTIMATED INVESTMENT AND INTEREST CHARGES, IMMEDIATE PROGRAM FOR LOS ANGELES

	Investment	Interest
Existing properties	$55,000,000	$3,300,000
Street railway and bus lines	7,006,000	490,420
Rapid transit tracks, appurtenances, equipment, etc.	30,533,000	2,137,310
	$92,539,000	$5,927,730
Elevated railway structures	32,925,000	2,304,750
	$125,464,000	$8,232,480
Subway structures	49,773,000	3,484,110
Total	$175,237,000	$11,716,590



Annual Revenue Passengers on Electric Lines Serving Los Angeles Compared with Automobile Registration in Los Angeles County, 1912-1924

to complete the work recommended for immediate construction. At the end of 1935 the annual net revenues based on various rates of fare were estimated as follows:

Fare	Net Revenue
5 cents	$5,230,000
6 cents	7,350,000
7 cents	9,850,000
8 cents	13,030,000

It was therefore evident that a minimum fare of 8 cents would be required to support the investment in the properties after they had been expanded. In place of this increased burden on the car rider, it was urged that the major cost of construction be financed by special assessment against the benefited property.

Quick Change of Signal System

OWING to the growth of traffic at Ealing Common station on the Metropolitan District Railway, London, England, a change in the signal system became necessary. This was handled with great dispatch by the railway's engineering staff while the line was under traffic.

Complete dismantling and removal of the old mechanical signal frame, replacement of the old signal cabin floor and installation of the new power frame complete with relay rack fitted up with the necessary relays and wiring were involved. In addition, all switches had to be changed over from mechanical to electrical action.

A schedule allocated definite work to each of the 47 men. After the passing of the last train at night the frame was pulled to pieces and by 3 a.m. it had been removed. The floor was out by 4.30. By 7 o'clock the new floor was in position for the new power frame. By 4.30 p.m. the frame was erected and most of the wiring completed. The wooden casing and the new illuminated diagram were next fixed. By 10.30 a.m. the next day the whole of the apparatus was ready. At the same time the new relay rack had been fixed and the relays coupled up. Meanwhile, six pairs of switches on the main road were taken out on the first night and the tracks run straight through. Afterward the new layout into the depot was gradually installed, the new switches being power operated. The signals at Ealing Common were made to work automatically during the changeover.

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The Readers' Forum

Dispatching Methods for Single-Track Interurban Operation

NEW HAVEN, CONN., March 23, 1925.

To the Editor:

During my twelve years of experience as an interurban motorman I have seen a variety of methods of operating interurban cars on single-track lines. These include verbal orders, home-made rules, hand-operated block signals, trolley-contact block signals, bulletins instead of written time-tables, the staff system, the standard code of rules revised to meet local conditions, single-form train orders, the positive meet system, and the A.R.A. standard rules with double-form train orders.

For light interurban lines running single-car trains with no heavy freights and not very high speed, I believe the trolley-contact block signal is the best. The oral telephone order with no written time-table is the most dangerous.

For the heavy interurban that operates more than one car per train and operates also heavy freight trains of from 10 to 50 cars, there is only one system that gives maximum safety, i.e., the standard A.R.A. rules with double-form train orders, used in connection with block signals operated by track circuits. The positive meet system is better for interurban roads than the time-card meet or superiority by direction. These involve too much red tape for the average interurban. Such important roads as the New York, New Haven & Hartford and the San Francisco & Sacramento and others have used positive meets for years with great success.

Some light interurban lines have dispatching systems that would do credit to a main-line steam railroad, while some of the heavy lines are very careless. These, however, are in the minority. Of course, it is not possible for all heavy interurban lines to have track circuit block signals, but the operators of such lines should at least have the standard form of train rules and see that the men obey them.

Once I worked for a heavy interurban road that actually encouraged its men to slight the rules in order to speed up the movement of trains. Happily that type of interurban is disappearing. Nowadays most roads believe in operating according to the rule book. Fifty years of railroad experience has proved it doesn't pay to make the rule book just a matter of form. If trainmen are allowed to supplement the rule book with so-called "horse sense" or judgment there is bound to be a conflict of methods that eventually causes a wreck. If you take chances you may win for several years but you only lose once, and a gambler always loses in time.

Trolley-contact block signals and the practice of operating cars from one siding to another without train orders are all right within certain limits. These signals are not designed for roads that do practically a steam road business. Though it is a great temptation for such roads to abolish train orders it cannot be done without jeopardizing safety. If you are operating trains with more than one trolley up through blocks protected by trolley-contact block signals you are creating a hazard, especially with the non-counting type of signal. The second or third trolley may clear the signal after it is first set. There are many other ways a train crew can get into trouble unless train orders are used to check the signals.

If operating passenger cars in trains and freights with electric locomotives, there is only one safe way to do—advance the trains by written double-form train orders. Don't expect the block signals to do the train dispatching. If using the standard rules there is absolutely no excuse for using single-form train orders. The dispatcher has trouble enough without increasing his worries with single-form orders that have been obsolete on the steam roads for years. The fact that you have few operators along the line is no excuse for following this dangerous and unnecessary method.

FRANK X. ROLLINS.

Large Bus Operations Analyzed

COMPARATIVE figures covering bus operations in America's two largest cities and the national capital have been prepared by John A. Beeler, consulting engineer, New York City. These are of interest to electric railway men as indicating results of bus operations on a large scale.

In New York and Chicago the double-deck type of bus operated by two men is standard, while in Washington the one-man single-deck type was used throughout last year. In the latter city double-deckers were first installed in February of this year. At the present time there are four double-deck buses in service and four more on order. Duplex single-deck buses which were in use during 1924 were replaced the early part of this year with Mack single deckers.

The fare in each of the three cities is now 10 cents,

TABLE I—BUS TRANSPORTATION IN NEW YORK, CHICAGO AND WASHINGTON COMPARED

	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Operating revenue (*a*)	$5,868,619	$4,990,434	$338,293
Operating deductions (*b*)	4,228,282	4,168,534	321,558
Taxes	594,364	326,871	2,149
Total operating deductions	4,822,646	4,495,405	323,707
Net earnings	1,045,973	495,029	14,586

(*a*) Includes passenger revenue and other revenue from operations.
(*b*) Includes operating expenses and reserve for renewals and retirements.

TABLE II—COMPARATIVE BUS STATISTICS

	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Passengers			
Passengers carried (revenue)	57,136,492	49,268,427	3,929,572
Passengers carried (transfer)	3,788,215	(*e*)	127,975
Passengers carried (total)	60,924,707	(*e*)	4,057,547
Service			
Maximum cars in daily service	308	313	36
Average seats each	51	63	22
Revenue miles	10,432,945	12,542,880	1,593,734
Revenue hours	1,295,819	1,245,763	152,454
Miles per hour	8.07	10.07	10.47
Passengers per revenue mile	5.83	3.93	2.55
Seat miles per passenger	8.75	15.93	8.65
Average length total ride, miles	2.58	4.27	2.00
Average per cent seats occupied	29.40	30.40	21
Fares			
Cash rate of fare, cents	10.00	10.00	(*c*) 10.00
Receipts per revenue pass., cents	10.00	10.00	(*d*) 8.50
Receipts per total pass., cents	9.39	.....	(*d*) 8.23
Amount paid per mile per pass. ride, cents	3.88	2.34	(*d*) 4.11
Earnings per hour			
Operating revenue per hour	$4.54	$4.01	$2.22
Total operating deductions, including taxes, per hour	3.73	3.61	2.12
Net earnings per hour	.81	.40	.10

(*c*) Fare raised May 1, 1924, from 8 cents cash to 10 cents cash or three tokens for 25 cents.
(*d*) Average for year.
(*e*) No record.

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TABLE III—EARNINGS, OPERATING RATIO AND INVESTMENT OF LARGE BUS COMPANIES

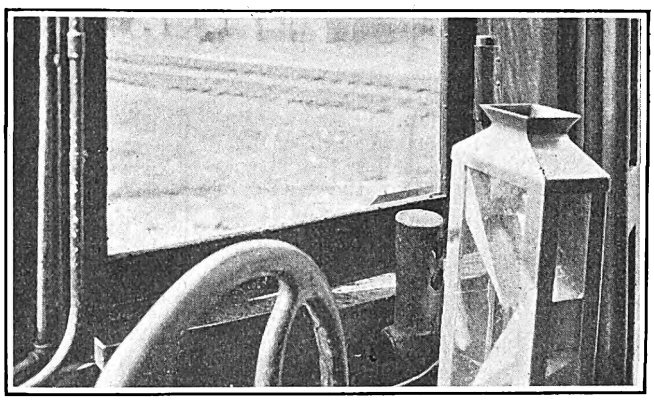
	Fifth Avenue Coach Company Year Ended June 30, 1924	Chicago Motor Coach Company Year Ended Dec. 31, 1924	Washington Rapid Transit Company Year Ended Dec. 31, 1924
Earnings per mile			
Operating revenue per mile, cents	56.1	39.8	21.2
Total operating deductions, including taxes, per mile	46.2	35.8	20.3
Net earnings per mile	9.9	4.0	0.9
Distribution of revenues			
Per cent of operating expenses to total operating revenue	72.0	83.5	95.1
Per cent taxes to revenue	10.1	6.5	0.6
Per cent net earnings to revenue	17.9	10.0	4.3
Investment			
Total	$4,321,000	$6,555,000	$182,940
Per dollar of total operating revenue	$0.74	$1.31	$0.54
Per passenger carried, cents	7.1	13.3	4.5
Per cent return on investment	24.2	7.5	8.0

although until May 1, 1924, the Washington Rapid Transit Company charged 8 cents. After that date the 10-cent fare was started with three tokens for 25 cents. This rate continued for the remainder of the year.

Information included in the tables is all from authoritative sources. Mr. Beeler has included operating deductions and taxes to give a true comparison of the companies. It is interesting to note that the Fifth Avenue Coach Company was easily the leader in earnings with receipts of 56.1 cents per mile and giving 24.2 per cent return on the investment. The Chicago Motor Coach Company earned 39.8 per mile, giving a return of 7.5 per cent on the investment; while the Washington Rapid Transit Company only earned 21.2 cents per mile. On account of much lower operating expenses it was able to return 8 per cent on the investment.

A wide difference in the number of passengers per revenue-mile is shown, the Fifth Avenue Coach Company carrying 5.83, the Chicago company 3.93 and the Washington company 2.55. On the other hand the Fifth Avenue company has considerably lower speed, averaging 8.07 m.p.h., while the Chicago and the Washington companies have 10.07 and 10.47 m.p.h. respectively. Other information is given in the accompanying tables.

Illuminating the Fare Box



Shrouded Lamp Illuminates Fare Box

LAMPS of a standard type are used for illuminating the Cleveland fare boxes of the New York State Railways. The lamp is installed on a condulet fitting and is provided with a sheet steel guard having two holes on the side nearest the fare box. The location of the fare box is at the front end of the vestibule next to the door opening, and the condulet for the lamp socket is installed on the dasher.

Association News & Discussions

Traffic Congestion Discussed in Los Angeles

Newly Organized Branch of Society of Automotive Engineers Hears of the Conditions Existing in Los Angeles and a Comparison with Other Large Cities—Possibilities of the Bus as a Means to Secure Traffic Relief

DR. WILLIAM McCLINTOCK of the Los Angeles Traffic Commission and P. B. Harris, chief engineer Los Angeles Railway Corporation, were the speakers of the evening at a meeting of the newly-organized branch of the Society of Automotive Engineers, at Los Angeles, on April 24. Dr. McClintock commenced by speaking of the problem of traffic congestion and its causes with reference to American cities in general. The principal causes of traffic congestion, in the opinion of the speaker, were due to the introduction of reinforced concrete and the construction of buildings of ever-increasing height. Cities now grow upward, the skyscrapers border on streets that were never designed to carry the traffic resulting. The streets of Los Angeles were planned for a pueblo of three, four or five-storied buildings, at most. One big building in the city now has to make provision in elevators, hallways and corridors for 100,000 persons per day. At Seventh and Broadway it has been estimated that 500,000 persons pass to and fro every 24 hours in street cars, in automobiles and on foot.

We have in the past 25 years, Dr. McClintock averred, emerged from the horse-and-man age into the automobile age. The registration of automobiles in the United States in 1905 was about 300; in 1925 it is expected to reach 18,000,000. Mr. Ford has stated that the saturation point is far off; but it should be remembered that a physical saturation may be reached before an economic one.

Los Angeles has an unusually high per capita wealth. The population per automobile is 2½; in New York it is nine and in Boston, seven. Los Angeles is the motorized city par excellence of the world, the number of registrations indicating that there is one automobile for each family of average size. These figures deflect attention to the problem of the individual motor car—the car in which one person only travels—which adds to the congestion of the city streets and complicates the traffic problem.

In the past the city traffic problem has been considered as a political question, efforts to ameliorate conditions prevailing being due to the solicitations of groups of individuals, most of whom were unacquainted with the underlying economics or technique of traffic control. By such method of solicitation the school-stop ordinance was introduced, which operated for nine months and resulted in an increase in accidents and further congestion. The traffic problem must be solved, Dr. McClintock insisted, by the adoption of methods used by engineers to solve similar problems. Allowable building heights must be reduced. There is ample excuse for tall office structures in New York City because of the size and

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geographic position of Manhattan Island, but there is no justification for similar structures in Los Angeles. It is regrettable that the idea is so prevalent that tall buildings alone can note prosperity and industrial expansion.

The use of automobiles and street cars on the same pavement results in friction—they are naturally retarding elements. Rapid transit facilities must be made attractive before people that can afford automobiles will use them. Below Fourteenth Street in New York City few automobiles are to be seen, which is due to the development of adequate rapid-transit facilities.

Proper street planning is an important factor in the relief of congestion, but in Los Angeles the streets that were designed for the traffic of a pueblo are forced to bear the traffic of a highly centralized industrial area. It is time to face the fact that the horse-drawn vehicle has been supplanted by an entirely different means of transportation. It is time to design streets for motor traffic.

The amelioration of traffic conditions in Los Angeles, which is a city of dead ends, involves the redesign of many existing streets and the cutting of new streets. The proportion of area devoted to traffic lanes in the city is 22 per cent of the total, as compared with 44 per cent in Washington, D. C. A consideration of the problems involved resulted in the formation, a year or so ago, of a traffic commission of three engineers, who have evolved what is know as the major traffic street plan. This is not original in detail, but is a composite of several known ideas and proved innovations. It recognizes the impossibility of redesigning downtown streets, mainly because of the prohibitive expense that would be involved. Its principal feature is the creation of what is known as a traffic quadrangle, the purpose of which is to surround the congested area with an adequate number of supplementary traffic arteries, which will pass around, not through, the congested area. It includes the provision of a truckway alongside the Los Angeles River, and several street extensions that will necessitate tunnels and viaducts, the ultimate result of which will be to bring outlying districts within easy reach of the downtown area. The plan has been adopted officially. Its consummation will necessitate an expenditure in all of about $300,000,000 and it is to be completed in about 25 years.

Buses Can Aid Rail Systems

The question "Can Motor Buses Relieve Congestion?" was answered by P. B. Harris, chief engineer Los Angeles Railway, in the negative. The removal of street cars, he maintained, would not help the present congestion. The motor bus, however, plays an important part as an aid to the street car system. It involves a smaller initial investment and its operating costs are lower. But as the electric railway service improves, Mr. Harris averred, conditions will be made more difficult for the bus. The street car is especially suitable for the meeting of heavy overload demands. Fewer units are needed to carry the same number of passengers, and the street car is less easily damaged than the bus. In the rush hours, and assuming adequate car service, there is no waiting. Crowding is inevitable at such times, but the service provided is as much as can be expected for the fare paid. Last Christmas an experiment was made in Los Angeles of increasing the number of cars in service in an effort to reduce overcrowding during rush hours. As a result the patrons arrived home an hour late, and subsequently showed preference for prior conditions.

Bus lines in a city should be operated by the company in control of the electric street car lines, so that a transfer system is practicable. Thus in Los Angeles, the Los Angeles Motor Bus Company is an offshoot of the Los Angeles Railway Corporation. The subsidiary is buying more buses, and it must be recognized, said Mr. Harris, that the newer method of transportation has a future. This is the conclusion after a year's operation. The Los Angeles Motor Bus Company has been well in advance in the introduction of improved equipment and was the first to use six-cylinder engines, air-braking systems and pneumatic tires on double-deck buses.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 12-13—Public Utility Section, Associated Advertising Clubs of the World, Houston, Tex.

May 14-16—Massachusetts Safety Conference, Copley Plaza Hotel, Boston.

May 19-22—Chamber of Commerce of the United States, annual meeting, Washington, D. C.

May 20-21—Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.

May 25-26—Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 27-28—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.

June 3-4—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Transportation at Chamber of Commerce Meeting

TRANSPORTATION will have a prominent place on the program for the thirteenth annual meeting of the Chamber of Commerce of the United States, to be held at Washington May 20, 21 and 22.

At a special transportation group session on May 21 a feature will be discussion from the floor on outstanding transportation problems which will be presented by leaders in this field. Carl R. Gray, president Union Pacific System, will outline the most important current developments in the railway field and measures for increasing the efficiency of the country's transportation system. The subject of "Regulation of Motor Carriers in Interstate Commerce" and the question of "Metropolitan Traffic Problems and How Chambers of Commerce Can Assist in Their Solution" will also be taken up. The latter subject will be handled by Harland Bartholomew of St. Louis.

Another feature of the group luncheon session this year will be the new method of considering resolutions to be acted on by the chamber at the annual meeting. Full consideration and debate on such resolutions will be arranged, and for this purpose all such resolutions will be presented as early as possible during the session and will be considered in detail at the end of the regular program.

Many general economic problems will be discussed at the convention, including some that are international as well as domestic in scope. Among the more important topics, as shown on the program, are the following: "The European Situation," "The Federal Trade Commission," "The Merchant Marine," "Agriculture" and "Business Conditions." The speakers among the higher government officials will include Secretary of Commerce Hoover, Secretary of Agriculture Jardine and Chairman Palmer of the Shipping Board. Leading business men also will discuss the subjects selected. A feature of the meeting will be the formal dedication of the chamber's new headquarters building at Washington, recently completed.

Traction Motors Discussed at Hague Meeting

RATING of traction motors was one of the important subjects discussed at the Hague meeting of the International Electrical Congress, held April 16-21. This meeting was attended by about 100 delegates, including several from the United States. The plan adopted of introducing new subjects by the reading and discussion of papers prepared by experts has given excellent results, clearing the air for definite proposals or rules later. This saves much time in the discussion of rules. The plan was used of introducing the subjects of traction motors and transformer oil, advisory committees meeting on these for the first time.

The one-hour rating for traction motors, which was advocated by the United States committee, was objected to on the grounds that it had no scientific basis and no definite relations to service conditions. It was agreed, how-

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ever, that traction motors require some test other than that necessary to determine temperature limits on continuous load, and the principle of the one hour plus the continuous rating was adopted unanimously. The United States committee proposals as to temperature rises were substantially met by some of the other nationals, and the United States proposals were finally accepted.

The proposals for commutator temperatures recommended by the Congress for adoption are:

For the one-hour test, 90 deg. C.

For the continuous test, 85 C.

The American proposal was for 95 and 80 deg. respectively. All tests are to be made with covers as arranged for service. Efficiency is to be based on the summation of losses corrected to 75 deg. C., but not to include gear losses.

Other subjects taken up were terminal markings, ratings of electrical machinery, prime movers, lamp bases and sockets, symbols, vocabulary, and transformer oil. On the last subject much interest was shown and plans were furthered for making tests through co-operation with the American Society for Testing Materials.

Purchasing Agents to Meet in Milwaukee

A COMPREHENSIVE program has been worked out for the forthcoming tenth annual Purchasing Agents' International Convention and Informashow in Milwaukee, May 25 to 28, inclusive. The sessions will be held in the Milwaukee Auditorium. The general convention sessions, opening May 25, will be held in Plankinton Hall, which has a seating capacity of more than 1,200.

The afternoon of the opening day will be given over to sectional meetings. Tuesday morning the second general convention session will be held in Plankinton Hall. It will open at 9 a.m. with a general discussion on scrap specifications and their value to all members. The afternoon session will again be given over to sectional meetings.

The usual order of business will be reversed on Wednesday, the morning being given over to the last of the sectional conferences, with the general convention session in the afternoon. In the morning the last meeting of the fuel conference will be held in Engelmann Hall, that of the public utility conference in Conference Room A and the meeting of the oil company buyers' group in Conference Room D.

Program for Canadian Convention

PRELIMINARIES for the 1925 convention of the Canadian Electric Railway Association are well under way. This convention will be held on June 10-12 jointly with the convention of the Canadian Electrical Association. Meetings of both associations and an exhibition of equipment and supplies will be held on the fifth and sixth floors of the Henry Morgan & Company, Ltd., Building, Union Avenue, corner of St. Catharine Street, Montreal.

Arrangements have been made for the presentation of two papers: "Recent Car Designs and Their Relation to Operating Conditions," by J. Metcalf, traffic department, and W. R. McRae, rolling stock and shops department, both of the Toronto Transportation Commission; "The Business of Selling Rides," by Walter Jackson, fare and bus consultant, Mount Vernon, N. Y.

A comprehensive report will be presented by the motor truck and bus committee of the association, F. D. Burpee, chairman. This report was deferred from last year in order to gather further data.

Entertainment features will include a golf match on June 10, followed by a dinner dance at the Golf Club and a dance at the Windsor Hotel on June 11.

Midwest Motor Transport Conference Program

HIGHWAYS as avenues of commerce and the relation of the electric railways to motor transport will be the principal topics of the Midwest Motor Transport Conference to be held at the Hotel LaSalle, Chicago, Ill., on May 27-28 under the auspices of the National Automobile Chamber of Commerce. One of the principal speakers will be Secretary of Agriculture William M. Jardine, whose topic will be "The Public and Highway Transport." Papers of particular interest to electric railway men will be "The Relation of Highway Transport to Other Transportation Agencies," by A. J. Brosseau, president Mack Trucks, Inc.; "The Electric Railways and Highway Transport," by Charles W. Chase, vice-president Chicago, Lake Shore & South Bend Railway and president Gary Street Railway; "The Field of the Motor Bus," by John A. Ritchie, president Chicago Motor Coach Company; "Economics of Motor Bus Operation," by H. A. Mullett, assistant general manager Milwaukee Electric Railway & Light Company; "Is Regulation of Interstate Motor Vehicles Necessary?" by T. R. Dahl, vice-president the White Company.

Central Master Mechanics to Meet at French Lick

IN ORDER to get the work of the newly organized Central Electric Railway Master Mechanics' Association under way, a special meeting of the association will be held at 2 p.m. on June 3. This meeting will be held in connection with the summer meeting of the Central Electric Railway Association at French Lick Springs, Ind. There will be no prepared program, the session being devoted entirely to committee work and discussion of such items of importance as may be presented.

Kansas City Scene of Midwest Meeting

SUBJECTS of vital interest to electric railways will be on the program now being arranged for the annual meeting of the Midwest Electric Railway Association. This will be held at the Baltimore Hotel in Kansas City, Mo., May 25 and 26.

American Association News

Engineering Symbols

A MEETING of the committee on engineering symbols was held at association headquarters, New York, on May 6. Those present were: H. R. Stamm, chairman; R. C. Cram, sponsor; H. W. Codding, C. W. Squier and W. Quinn, who represented J. F. Neild. Tracings of symbols were presented for each of the groups being considered by the committee. Agreement was reached as to topographical, building and structures, electrical railroad, mathematical, and mechanical symbols. Many of the tracings were in finished form, so that cuts can be made for the final report. Other groups were brought up so that final tracings can be made at once. The work completed is very extensive.

Special Reports Available

THE following special reports have been prepared by the Bureau of Information and Service of the association and are available to member companies in good standing upon request:

Bulletin No. 21. Electric Railway Operations in 1924. Contains a summary of the revenues, expenses, net revenue and passenger traffic of 370 companies in 1924 in comparison with the same items in 1923. Also contains complete comparative analyses of the operations of 261 companies classified into city, interurban and combination city and interurban companies and further classified into three smaller groups according to the size of the company. For each group there is shown a complete income statement, detail of operating expenses, operating statistics and derived ratios and unit figures for comparison.

Bulletin No. 22. Bus Operations of Electric Railways in 1924. A summary and analysis of the bus operations of 58 electric railways, and a tabulation of the individual returns with certain of the more important figures shown on a unit basis for the purpose of more accurate comparison. In addition it contains combined statements for all of the companies covering revenues, expenses, net taxes, car-miles, passengers carried, gasoline consumption and the number of buses operated, with a summary of methods of depreciation adopted by the various companies.

Bulletin No. 23. Special Factors Affecting the Working Conditions of Electric Railway Trainmen. A tabulation of information covering a number of miscellaneous conditions, such as the allowance of time off periodically, giving of vacations, establishing of pension systems and systems of employee representation, companies' contribution to cost of uniforms, labor turnover, union affiliations of trainmen, etc.

Bulletin No. 24. Selected Exhibits Presented by Electric Railways in Washington Arbitration Proceedings. This is a revision of the compilation issued June 1, 1924, and contains copies of exhibits used in arbitration cases occurring in the last year. They have been selected from a large number of exhibits because it is believed they present in an effective way the facts on the subject they treat of and will be valuable to many companies preparing for an arbitration case. Some of the subjects covered are: Wages in relation to cost of living, relation of trainmen's wages to wages in other local industries, family budgets of trainmen, nature of trainmen's work and skill required, average wages earned, size of trainmen's families, company's financial condition, effect of wage increases, improvement in working conditions, etc.

In addition to the above, supplements to the Fare Bulletin, Wage Bulletin and Cost of Living Studies (Bulletin No. 25) have been prepared, bringing them down to date.

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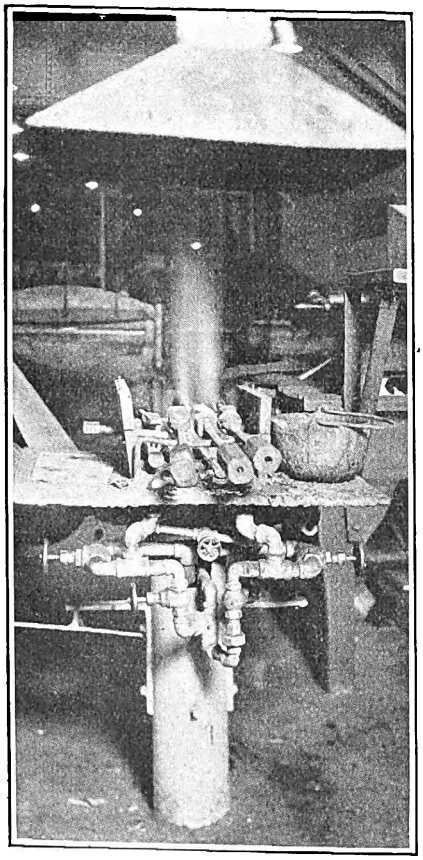
Maintenance of Equipment

Convenient Heater for Soldering Irons

SOLDERING irons are heated conveniently in a gas furnace installed in a central location in the armature room of the 65th Street



Soldering Irons Are Heated in a Centrally Located Gas Furnace in the 65th Street Shops of the Third Avenue Railway

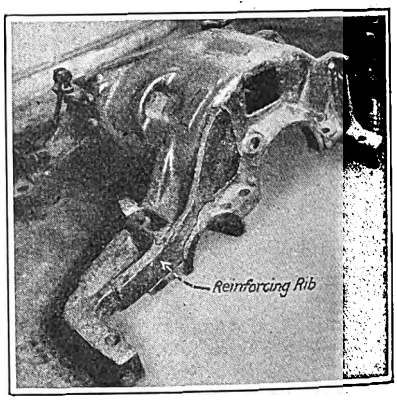
shops of the Third Avenue Railway, New York City. The table and burners are 30 in. above the floor and a central support is provided by a 6-in. pipe which is imbedded in the concrete floor. The various pipes for supply of air and gas, with suitable control valves, are arranged about this central support. Half-inch pipe and fittings are used for the connections. There are four horizontal burners. These are surrounded by a rack, so as to hold the soldering irons in place and provide a grating support over the burners. A pilot light is also provided so that the burners light automatically whenever gas and air are turned on. The top sheet steel support is extended outside of the rack for the soldering irons so as to provide convenient shelves to hold pots for soldering salts and solder. A sheet-steel hood is mounted over the burner to receive and carry off any fumes. This arrangement of a centrally located gas furnace does away with the necessity of each workman having a furnace to heat his iron during soldering operations. The location has been selected so that it is convenient to all.

Calipering Inside End Bells of Armatures

IN ORDER to provide uniform dimensions between the end bells of armatures of the same type the New York State Railways in its Utica Park shops uses a special outside caliper made in the shop. A bar of ½-in. x ⅝-in. cold-rolled steel with one end bent down into an inside projection with pointed end forms one arm. A scale graduated in sixteenths of an inch is marked along the top edge of the bar. The sliding arm of the caliper consists of a casting with the slide accurately machined to fit the bar. The lower part has a projection with pointed end the same as the opposite end of the bar. Friction for the slide on the bar is provided by two bronze studs which are held in firm contact with the bar by a flat spring. This spring is secured to the arm at its center, leaving the ends free to bear on the outside end of the bronze studs. The accompanying illustration shows method of using the gage in measuring up an armature. This particular gage will take armatures with a 20-in. diameter core.

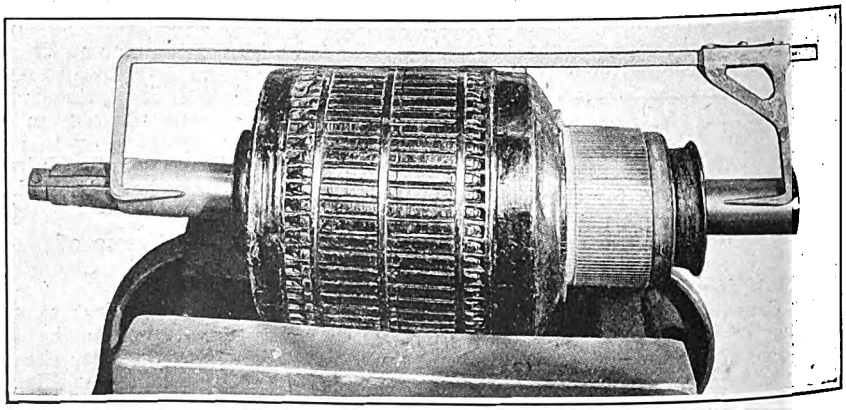
Reinforcing Rib Welded on Motor Case

GEAR case supporting arms on Westinghouse No. 306 motors have been reinforced with a secondary rib welded to the motor case by the City Railway of Dayton, Ohio.



Broken Motor Gear Case Arms Are Repaired by the City Railway of Dayton with a Reinforcing Rib Welded to the Motor Case

Some difficulty has been experienced from breaking the gear case arm. The new reinforcement has been found to overcome the difficulty entirely. It consists of a ⅝-in. thick steel plate, cut and formed to the proper shape to fit the motor case. Putting the rib in place is a simple shop job. It is welded in place with a Wilson welder. Broken cases have been repaired by this method and are found to be stronger than when new. A jig was made up to hold the



A Shop-Constructed Outside Caliper Used for Gaging Armature End Bells

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broken arm in place during the welding. This is so designed that the axle bearing housing is maintained in correct alignment while the repair is being made.

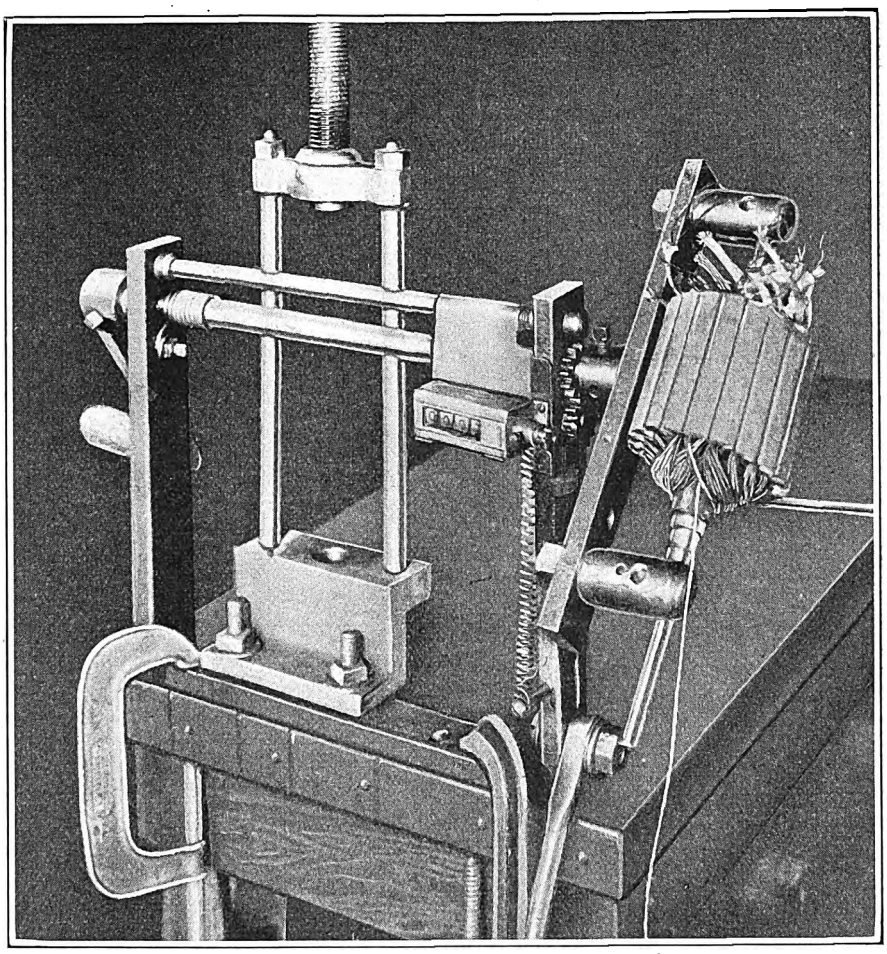
Air Cylinder Presses Out Bearings

IN THE Chelsea shop of the Eastern Massachusetts Street Railway a convenient apparatus has been devised for pressing in and out armature bearings. The pressure is supplied by a 16-in. air cylinder formerly mounted on a coal car and used for dumping the hopper. This cylinder is located on the floor alongside the wall of the building with the piston end up. It is controlled by an engineer's valve. The bearing is placed on a table about 6 ft. away from the wall. By an arrangement of levers the upward movement of the piston of the air cylinder causes a downward movement against the armature bearing and presses it out.

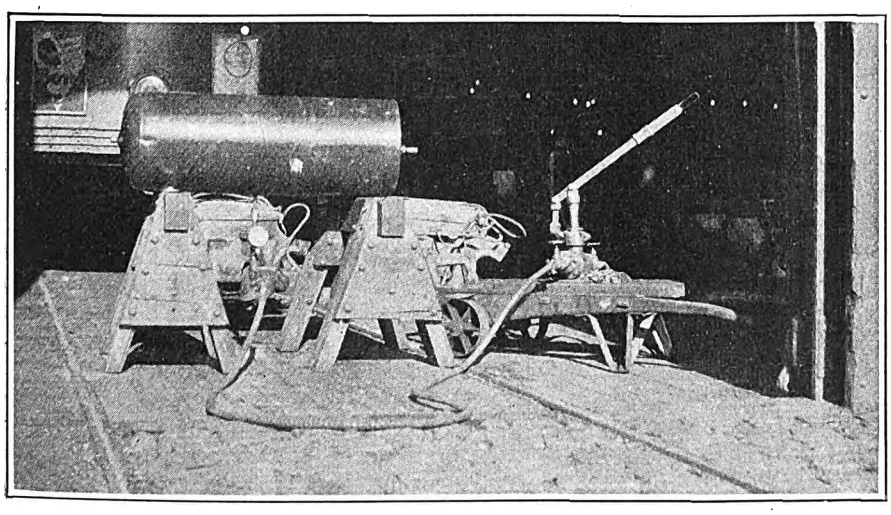
Winding Machine for Small Armatures

SMALL armatures are rewound in the Utica Park shops of the New York State Railways on the device shown in the accompanying illustration. A rotating head with bearings which can be adjusted to suit various sizes of armatures is turned by a crank at the opposite end of the shaft to which it is attached. Gearing from the shaft drives a counter to record the number of turns.

A novel feature of this machine is the method used to prevent backturning of the handle. A coil spring surrounds the shaft tightly at the crank end. One end of this spring is fastened to the upright support while the other end is loose. Turning the handle in the proper direction opens up the spring so that movement is not interfered with, but on an attempt to turn in the opposite direction the spring at once grips the shaft to such an extent as to prevent further motion. This simple arrangement has worked very satisfactorily. The machine is held on the bench by C clamps and can be removed readily.



Small Armatures Are Wound on This Machine at Utica, N. Y.



A Few Strokes of This Hand Pump Produce a Pressure of 150 Lb. per Square Inch for Testing Air Tanks

Hydraulic Testing of Air Tanks

ON THE Eastern Massachusetts Street Railway cars are overhauled every 75,000 miles and air tanks are thoroughly tested. The tank is taken off the car, cleaned, examined and painted with red lead. It is then tested under hydraulic pressure and if found to be in good condition it is stenciled with the date of testing and replaced under the car.

In making the test the tank is supported on two wooden horses, as shown in an accompanying illustration. A short piece of pipe with a valve and pressure gage is attached to the outlet pipe. A hose connected to a hand pump and from there to a water faucet is then attached to the tank. An escape valve is allowed to remain open until the tank has been completely filled with water. This is then closed and a few strokes of the pump serve to bring the pressure up to 150 lb. per square inch, the maximum required for the test. If no holes in the tank are disclosed at this pressure it is considered sound and is returned to service.

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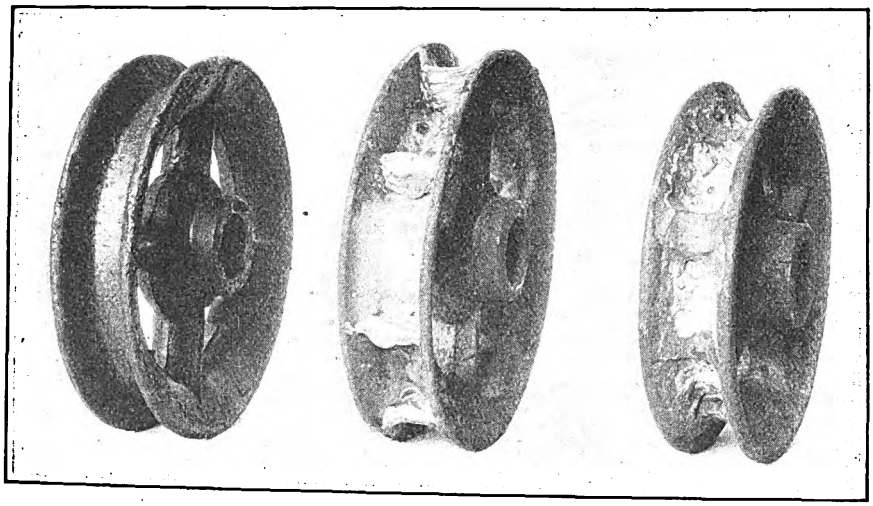


Making Sleet Cutters Out of Worn Trolley Wheels
At left—Worn trolley wheel. In center—Wheel with spots welded in place. At right—Sleet cutter after having been in service.

Making Sleet Cutters from Worn Trolley Wheels

SEVERE weather conditions are of frequent occurrence on lines of the New York State Railways, and provision for removing sleet from the trolley wire is quite essential. A very effective form of sleet cutter is made from a worn trolley wheel by welding spots of bronze into the groove at frequent intervals. The illustration shows the process as developed at the Wolf Street shop, Syracuse. The wheel at the left is one ready to be filled in. The center wheel has the spots welded in place, and the wheel at the right is one that has been in service.

Poles Reinforced with Rail

UNSALABLE slot rails removed from old cable track have been used to good advantage in the construction of reinforced concrete poles by the Market Street Railway, San Francisco, Cal. They have the same dimensions and appearance as the company's standard tubular poles.

New Equipment Available

Power-Driven Earth Drill

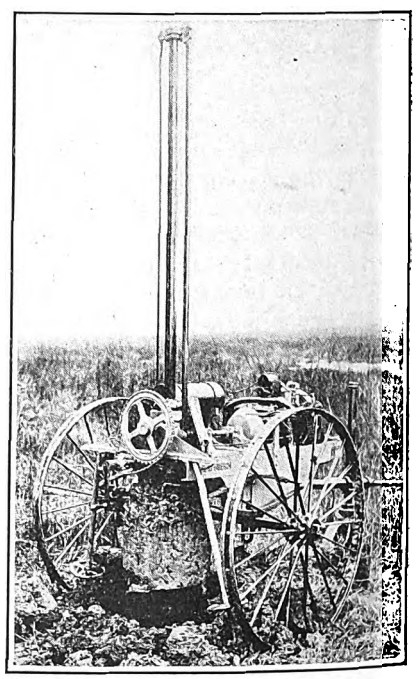
HOLES in earth, clay, shale or hardpan are dug easily with the Buda-Hubron earth drill, which has been placed on the market by the Buda Company, Harvey, Ill. Its use is suitable for pole-line work of all descriptions, as well as for fence posts, foundations and blasting operations. The drill proper, which is held in a specially designed chuck mounted on the drill spindle, is lowered or fed by hand and raised by power. The large-sized drills, made up to a diameter of 20-in., are formed of a single cast-steel helix polished on the top surface and provided with a special check valve. Removable manganese and carbon steel cutters are bolted to the helix and can be removed easily when worn. When the drill is lowered, the earth as it is loosened by the cutters is forced up through the check valve and slips on the polished top surface of the helix but does not turn in the hole with the drill. This feature means a large saving of power and is the secret of the digging capacity of the machine.

When about 2 ft. of earth has collected on the top of the drill, the drive clutch is disengaged and the drill raised to the surface by engaging the lifting clutch. The drive clutch is then engaged and the whirling drill throws the dirt around outside of the hole. Speed of drilling depends on the character of the ground. In heavy clay an 18-in. or 22-in. diameter hole can be sunk 6 ft. in three minutes. The number of holes dug per hour varies, due to the right-of-way conditions, but six holes an hour may be considered a fair average, although ten to twelve holes an hour have been dug under favorable conditions.

The drill is simple to operate. Being mounted on springs, the machine moves upward when the drill strikes an obstruction and drops back into place when the obstruction has been dislodged, thus removing undue strain on the drilling mechanism. The cone friction clutch, which connects the engine to the main driveshaft, is so designed that it will slip when the drill strikes an obstruction too large to be removed. All parts of the equipment are designed to stand severe and continuous service. Roller bearings are used on the main driveshaft, and large heat-treated gears running in oil are used in the drill head.

The engine is a standard Buda design of the four-cycle, horizontal, two-cylinder, air-cooled type of 4-in. bore and 4-in. stroke. It is equipped with high-tension magneto and gear oil pump.

This earth drill is made in two models. One is mounted on either steel or rubber-tired wheels and may be towed behind an automobile to the site of the work. It is used on rough and uneven ground, as it can be adjusted to drill at any reasonable angle. The other model of machine is designed for mounting on any standard motor truck. It is carried on a special sub-frame which is bolted directly to the floor of the truck body. With this arrangement, an adjustment of 25 deg. fore and aft and 20 deg. sideways is possible. This machine can be mounted on a standard platform truck in a few minutes and may be taken off readily when the truck is required for other work.



A Self-Contained Earth Drill for Pole Work or Blasting

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The News of the Industry

Cleveland Labor Restive

Employees Threaten Strike Following Declaration of Open Shop and Announcement of Wage Advance

Open shop conditions have been in force on the lines of the Cleveland Railway since Tuesday night, May 5. Bulletins to this effect were posted at all the company carhouses after word had been received from Columbus that the State Supreme Court had refused to hear the appeal of the union from the decision of the Court of Appeals. The refusal of the State Supreme Court to grant the men a rehearing of their case marks an end of a struggle between the company and union continued for more than a year.

The bulletin said that henceforward there would be no contract between the union and the company. It was also announced that, effective on May 1, the company granted the men a wage increase of 5 cents an hour. This makes the new schedule of wages 60 cents an hour for the first three months of service, 63 cents an hour for the next nine months, and 65 cents an hour after the first year. There are no changes in any of the working conditions and no discrimination will be made between union and non-union men. These things the company has publicly proclaimed.

The union will meet within a few days to decide its future course of action. It is pointed out, however, that inasmuch as the courts have held the closed shop agreement illegal, it will be difficult for the men to call a strike against a court decision.

Question a Year Old

A year ago, when the men demanded a wage increase of 15 cents an hour, the company refused, and under the terms of its contract with the union, the demand went to an arbitration board. This arbitration board increased the pay of the men 12 cents an hour, but previous to the announcement of the award, the company withdrew on the ground that the key member of the arbitration board, James W. Holcomb, former city street railway commissioner, was biased and prejudiced against the company and that he had disqualified himself from sitting on the board by reason of having been indorsed by the carmen's union for a federal position. The union appealed to the courts to uphold the award.

The Common Pleas Court then ruled that the award was illegal on the ground of fraud, but sustained the closed shop contract. When both the men and the company appealed the case to the Court of Appeals, this court not only held the 12-cent wage award illegal but also set aside the closed shop contract between the company and men on the ground that it was contrary to public policy. It is this decision the Supreme Court has now sustained by refusing to hear the case.

At a meeting on the night of May 6 the men decided to demand a 10-cent increase instead of the 5-cent hourly increase which the railway ordered. In addition, the men asked a formal contract recognizing the union, although on open shop terms. The union executive committee on May 7 presented these demands to President John J. Stanley. He is expected to refuse anything more than the 5-cent increase. The union was to meet again on the night of May 7 to map out a future course. A strike does not seem imminent.

Increase in Fares Sought in Pasadena

The Pacific Electric Railway, Los Angeles, Cal., has applied to the Railroad Commission for permission to increase its street car and motor coach fares in the city of Pasadena, as follows: 6-cent fares to be increased to 8 cents; school children's 40-ride books from $1.20 to $1.60; eight-ride tickets for 50 cents, instead of ten-ride tickets for 50 cents; 10-cent fares to be increased to 12 cents. The applicant presages the need for an increase on the fact that there is a deficit of $162,506 in railway and bus earnings.

Worcester Going Ahead

Railway There Joins Other Companies that Are Turning Bus to Their Advantage—Brief Review of Some of the Recent Moves—Responsible Operators Favored

DEFINITE developments in the plans which the Worcester Consolidated Street Railway, Worcester, Mass., is making with respect to the use of the bus by it give an indication of the attitude of the public mind in central Massachusetts. The Consolidated announced that it will soon restore service from Worcester to Leicester and Spencer and that there would be reduced rates through use of tickets to regular patrons. Selectmen of Leicester immediately made known that they would oppose the re-establishment of railway service, but would give no indication of how they would express such opposition.

Despite this the railway went right ahead with plans for the resumption of this service, asserting that it does not need the approval of the Leicester Selectmen to put the line back into service even though the suspension has been of six months duration. In the meantime buses are running from Worcester to Leicester, Spencer and even into Brookfields and enjoying large patronage, so much so that schedules have had to be increased and new buses added.

Recently the State Department of Public Utilities held a hearing on the petition of the railway to be allowed to operate buses in communities which its rail lines now serve. The department has not yet acted on the petition, but even if it is granted the railway will have to apply to the authorities of each town for bus licenses. The railway is preparing to compete with the independently owned bus lines so that there will be no delay if it receives authority from the state and the community.

In line with this policy the railway has applied to the Southbridge Selectmen for permission to operate buses between Worcester and Southbridge, with auxiliary bus lines from more distant sections of the town. Three other applications to operate buses from Worcester to Southbridge from private companies are also in the hands of the Southbridge Selectmen.

At Southbridge Charles C. O'Donnell, superintendent of the railway, urged exclusive rights for the railway on the ground of its previous record and emphasized that valuable freight and mail service could be given by the railway in conjunction with the bus service. W. W. Buckley, town clerk, said there were 29 jitneys in operation in Southbridge, none of which carried passenger insurance, which meant that the passengers must travel at their own risk. The Consolidated, if it can get the required permission, expects to get its Southbridge-Worcester bus service in operation by June 1.

Other bus routes planned by the railway are an express line to Southbridge by way of Oxford and Charlton, a line to Fitchburg through West Boylston, Sterling and Leominster from Worcester and several others. These would replace the trolley lines entirely rather than supplement them as in the case of Southbridge, Leicester and Spencer.

With reference to the city of Worcester the Consolidated is considering bus service from Lincoln Square to replace the Boynton Street trolley.

The Selectmen of Millbury, Mass., which is about 5 miles from Worcester, have settled the bus question for this year. They declare no licenses for buses will be granted. This action followed the report that the Worcester Consolidated, intended to establish a bus line. Town officials explained that they feared the railway might abandon its carhouse properties there and the town would be a big loser in the matter of taxation, if bus rights were granted.

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Yonkers Electrification to Proceed

The Public Service Commission of New York on May 6 issued an order approving the plans of the New York Central Railroad for the electrification of the Yonkers branch of its Putnam division. The order provides that the existing system of electrification on the New York Central in New York City shall be applied. The company proposes to proceed immediately with the electrification of the two tracks of the branch.

The substations supplying power will be Mott Haven, Marble Hill and Glenwood. Plans and specifications for the proposed work must be submitted to the commission for approval before any construction work is done. The order also directs the railroad to file on or before July 1, 1925, a statement or detailed plans for the electrification of its so-called main line, Putnam division and Saw Mill River branch, north of the Yonkers branch.

597 Certificates at Boston

The Boston Elevated Railway, Boston, Mass., has completed its educational program for the season 1924-25. It consisted of a series of departmental group conferences arranged for each of the transportation, power, maintenance and rolling stock and shops departments and the women's group.

Certificates were awarded to 597 employees, divided by groups as follows:

Transportation	214
Power	112
Maintenance	139
Rolling stock and shops	100
Women's	32
Total	597

The program was described in the ELECTRIC RAILWAY JOURNAL for Nov. 1, 1924, and Feb. 14, 1925.

Bill for Indeterminate Franchises in Illinois

Utilities of Illinois as represented in several associations have settled upon the principle of indeterminate permits instead of franchises in the present storm of prospective legislation aimed to avert the Chicago transportation crisis due at the expiration of franchises in 1927. The bill best fitted, in principle, to meet the present situation is the so-called Barr measure, now before the Legislature, but it is being riddled because ultimately it takes all jurisdiction out of municipalities' hands.

The hope is to get rid of the twenty-year franchise limitation, now statutory. Under the name "indeterminate franchise," the proposed plan has had a long try-out in Wisconsin and in Indiana. Under it the utility must not only establish public confidence, but it must keep that confidence. It is pointed out that there is nothing in the plan to prevent a permit from running 100 years.

Mayor Dever has launched a campaign to kill the Barr bill or amend it to make the city the judge of the "good behavior" condition on which the permits would be issued. To him has rallied most of the odds and ends of the crowd that beat the $500,000,000 transportation plan at the polls.

A duplicate of the Massachusetts public benefits law, offered in Illinois to permit subway building with subsequent fixing of public assessments, had hard sledding at a Senate hearing. Opponents said it robbed the public of any slim chance now held to protect itself against undesirable improvements, and finally the bill was tabled.

New York State Men Reject Pay Proposal

By a vote of 552 to 516, employees of the New York State Railways in the cities of Rochester, Syracuse and Utica turned down the proposal to renew the existing wage and labor contract with the company. Union men in Rochester voted against renewal 422 to 110. This offset the majorities for adoption in Syracuse and in Utica. Syracuse cast 209 votes for and 42 against. The Utica result was 197 to 88 for the pact renewal. Only 1,068 of the total membership of 3,000 in the three cities took part.

The existing schedule calls for a wage of 51 cents an hour for the first three months, 53 cents for more than three months up to a year and 55 cents for more than a year's service. Interurban operators receive 2 cents more an hour and operators of one-man cars 5 cents additional. The basic day is 9½ hours and the maximum limit for overtime is 75 cents an hour.

In the preliminary bargaining the union asked for a general 7-cent increase and certain revisions in working conditions. The company countered with a demand for a 5-cent cut. In conferences a compromise was effected along the lines of the present contract. This agreement was the one turned down by the workers.

The varying vote in the three cities is explained by the different classes of work. In Syracuse and Utica nearly all employees are of the one-man classification, receiving 60 cents an hour. In Rochester the two-man operators predominate. While Rochester employees generally protest against the universal adoption of the one-man car, they insist that the wage scale in the Kodak City be brought up to the standard in Utica and Syracuse. Arbitration will remove all possibilities of a strike. The present compact expired on May 1.

Employees of the Auburn & Syracuse Railroad have agreed to a continuation of the existing agreement, which includes a 50-cent an hour pay provision.

10 per Cent Wage Increase Sought in New Orleans

An advance in wages of approximately 10 per cent has been asked by the 3,000 employees of the New Orleans Public Service, Inc., affiliated with the Amalgamated Association. The two-year agreement entered into between the corporation and its employees last year left it discretionary with the contracting parties to reopen the negotiations at the expiration of twelve months. The wage scale effective under this agreement for motormen and conductors was 47 cents an hour for the first six months, 49 cents for the succeeding six months and 51 cents thereafter.

Third Atlanta Arbitrator Selected

Edwin F. Johnson, Fulton County Commissioner, has been selected as the third member of the arbitration board which is to consider a demand for wage increases made by the Amalgamated Association on the Georgia Railway & Power Company, Atlanta, Ga. The board, in addition to Mr. Johnson, is composed of C. M. Candler, arbitrator selected by the company, and Luther Still, member of the Atlanta Typographical Union, by the men.

The arbitration body is the same that officiated last year when wages were increased from 48 to 51 cents an hour. The new demand is for an increase from 51 to 60 cents an hour for motormen and conductors, with demands for proportionate increases for others.

Basic Wage in Philadelphia Is 77 Cents

A plan now being prepared by the Philadelphia Rapid Transit Company, Philadelphia, Pa., provides for a basic wage which would rise and fall in accordance with its purchasing power, plus an added wage to encourage greatest employee efficiency. This plan would in effect mean two wage scales—one providing for adequate living and saving in good times or in bad and the other providing the employee with a stake in the game and giving opportunity for improvement in his living conditions and those of his family. The actual wages of P. R. T. employees have departed so far from the war-time expedient of the three-city average that the company has long been seeking a more accurate measure.

Since 1922 the employees of the company have received a co-operative wage participation, not to exceed 10 per cent of the annual payroll, in return for the co-operative effort. Although the wage participation has always been a part of the wages of employees, the policy of making it payable only after the earning of the stockholders' dividend has created the impression, in spite of repeated denials, that it is a bonus rather than a wage. In order to settle this question finally, Mitten Management suggested that the 10 per cent added wage be included as an operating expense payable before instead of after fixed charges and dividends.

The general committee for employees has approved this procedure, and it will be made retroactive to Jan. 1, 1925. The basic wage of P. R. T. employees will thus become 77 cents an hour, 7 cents of which is in payment for added effort, to be turned over, as now, to the employee trustees for investment.

The company explains:

P. R. T. trainmen's wages for several years after the incoming of Mitten Management in 1911 were based on an annual sum equal to 22 per cent of P. R. T. gross earnings, so that wages increased as the effort of the men made increased wages possible. In 1918 the abnormal conditions due to the war, and the desire to bring all departments into the co-operative plan, led to the adoption of a wage based on the average paid in four large cities—Chicago, Detroit, Cleveland and Buffalo, the latter being afterward dropped when Mitten Management took over operation of that property. The 10 per cent wage participation was added after P. R. T. employees had proved themselves much more effective than the employees in these other cities. The present wage is now effective for this year regardless of what happens in the three other cities.

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Recent Bus Developments

Eastern Massachusetts Street Railway Retires from Boston-Lowell Service—Projects Reported from Many Quarters

AFTER many complexities the Eastern Massachusetts Street Railway lost its fight with the Boston & Maine Railroad over the right to operate a bus line between Boston and Lowell. Its service was, therefore, discontinued Tuesday evening, May 5, after the company had permitted passengers to ride free several days to overcome a legal technicality.

The company had operated the buses for about eight months under a license in each city and town along the route. When the question of renewal of the licenses came up the Boston & Maine Railroad entered a protest in each place. The sharpest kind of a campaign was carried on by the contestants.

Cambridge proved to be the key to the situation. There the City Council voted unanimously to renew the license and the Eastern Massachusetts expected no further difficulty in that city, but Mayor Quinn refused to sign the license, and without his signature the grant was not valid. Consequently on May 1 the Eastern Massachusetts lost its right to operate these buses through Cambridge, for hire, but as a matter of strategy, to conserve its legal standing pending developments, the Board of Public Trustees decided to operate the buses free. The railway was guaranteed against loss during the period of free operation by one of its stockholders.

The San Diego Electric Railway, San Diego, Cal., has been authorized by the Railroad Commission to discontinue the operation of its motor coach line between National City and Chula Vista and to discontinue the operation of railway service over tracks of the San Diego & Arizona Railway between Twenty-fourth Street, National City, and Third Street, Chula Vista.

As the result of further hearing by Railroad Commission of the complaint of the city of Oakland against the Key System Transit Company, alleging inadequate local service, the commission has directed the company to make application to the proper municipal authorities for franchises, or permits, to extend the existing Montclair-Glenwood coach route to serve the district in the vicinity of Fortieth and Piedmont Avenues. This line was recently rerouted to start from the intersection of Piedmont and Pleasant Valley Avenues in the city of Oakland. The commission also directed the company to extend its Thirty-fifth Avenue coach line to Jordan Road during the morning and afternoon rush period, but during the remainder of the day to leave the terminus of the line at Thirty-fifth Avenue and Hopkins Street. Rerouting of the Foothill Boulevard and 82d Avenue coach line was ordered.

The New Orleans Public Service, Inc., New Orleans, La., has three lines of buses in operation as feeders to the railway in sections of the city not sufficiently populated to warrant railway lines. Ten single-deck buses are in use each with a seating capacity of from 25 to 28 passengers. Authority has been obtained from the Commission Council to establish lines on the Gentilly Road, the Canal Boulevard and Broad Street.

The City Council of Seattle, Wash., recently passed an ordinance authorizing the operation of buses on Empire Way by the Seattle Municipal Railway. An eleventh-hour effort to block the ordinance was made by the Seattle & Rainier Valley Railway in a communication in which it called attention to the fact that if the municipal bus service is started on Empire Way, it will reduce the volume of business of the railway and thereby increase its unit cost of hauling passengers, which at present is claimed to be almost equal to the unit gross revenue. The Council has denied the application of the Rainier Valley Railway to operate buses to the Seward Park district.

By means of a new motor route started by the Indianapolis & Cincinnati Traction Company direct shipping connections are established between Shelbyville, Ind., and the territory to the south, including Hope, Rugby, Hartsville and Millford.

A definite plan for establishment of six new bus lines in Cambridge by the Boston Elevated was disclosed recently by receipt of a petition for permits, together with application for renewals of those for the two bus lines already being operated in Cambridge.

Laconia Street Railway, Laconia, N. H., has purchased two 21-passenger Reo buses for transporting passengers to the Weirs. A single-track electric line of about 5 miles, formerly operated for this service, will be discontinued. This line will serve summer resorts on Lake Winnepesaukee. Buses will operate on an hourly schedule.

The bill of Assemblyman Hanson allowing electric railways to go into the bus business without forming subsidiary companies for this purpose has been passed by the New Jersey Legislature. The bill of Assemblyman Beardsley relieving corporations from the responsibility of taking out damage insurance for accidents to passengers while riding in their buses has also been passed.

An effort is being made by the motor interests of Massachusetts to have the new bus law placed on the ballot for a referendum vote at the next state election. The law which was enacted in Massachusetts by this year's Legislature, has been signed by the Governor. It requires a certificate of necessity and public convenience from the State Department of Public Utilities in order to operate a bus line and places the bus lines under substantially the same control as the electric railways. Its enactment was sought by the electric railways and the railroads to protect them against uncontrolled and unfair competition.

Mayor Ulrich Wiesendanger of Yonkers, N. Y., has further complicated the bus controversy there by announcing that he has decided to veto the ordinance passed by Yonkers Aldermen to give the permit for the sole operation of buses in Yonkers to the Westchester Bus Corporation. The Audubon Transportation Company, Yonkers, has been restrained from operating buses for three months on application of the Union Railway, subsidiary of the Third Avenue Railway.

Management of Toledo Road Offered to City

Henry L. Doherty has sent a letter to Mayor Brough of Toledo, Ohio, suggesting a fund of $2,000,000 be raised for needed improvements and extensions to the property of the Community Traction Company and offering to turn control of the road over to citizens of Toledo. He will take a block of $500,000 of preferred stock of the Community Traction Company, provided the citizens of Toledo subscribe for $1,500,000 of the same issue. The voting power would go to the purchasers of this block of preferred stock. At the meeting of the Council on the evening of May 4 the matter was turned over to the Board of Street Railway Control for study.

Mr. Doherty said that the "street railway property will never get the co-operation of the people of Toledo that it deserves until it is owned, or more substantially owned, either by the city itself or by the people of Toledo." He said:

> If we could enlist the active participation of the representative citizens of Toledo in a comprehensive transportation system we could command the best brains of all Toledo in business, financial and other lines in solving all of the problems as they arise that have to do with traffic.
>
> I have recommended, and the board has passed, proper resolutions authorizing the officers of the Cities Service Company to purchase an additional $500,000 of preferred stock in the Community Traction Company, providing a group of representative citizens will purchase an amount equal to what our then holdings will be, namely, $1,500,000, and the board has further authorized us to assign all of our right, title and interest, without further consideration, in the common stock of the Community Traction Company to this group of citizens, with the expectation of turning over to them the control and management of the company in the joint capacity of serving both the needs of the city and citizens and the needs of the company.

The original capitalization of the Community Traction Company provided for $8,000,000 of 6 per cent first mortgage bonds, $2,000,000 of 8 per cent preferred and $10,000,000 of common stock to be held in trust by sinking fund trustees of the city and issued to the city of Toledo upon redemption of the bonds or preferred stock through the operations of the sinking fund.

To date nearly $900,000 of bonds has been retired and a similar amount of common stock—the only outstanding—issued to the city.

The city has one member on the board of directors of the company.

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Ten-Cent Fare Sought in Savannah

A petition has just been filed with the Georgia Public Service Commission by the Savannah Electric & Power Company for a 10-cent cash fare, five tickets for 35 cents, or a weekly pass, intended to be sold for $1.25. The company also proposes to sell 30 tickets for $1 to children under 12 years of age. The present rate in Savannah is 7 cents. The fare case will be heard May 19.

Electrification of Canadian Line Awaits Outcome of Experiments

The electrification of the Toronto Eastern Railway, Toronto, Ont., is being held in abeyance while experiments are being carried on with unit type cars which, if successful, would dispense with overhead equipment. R. A. C. Henry, director of the Bureau of Economies of the Canadian National Railways, informed the railway committee of the Canadian House of Commons that the experiments would probably be completed by the end of this year. To put the line into operation would probably involve an expenditure of $1,000,000.

Service-at-Cost Measure Approved in Missouri

Governor Baker of Missouri has signed the bill which enables municipalities of 100,000 population to enter into agreements with railways, bus companies or other common carriers for fares based on the actual cost of operation, subject to approval by the Missouri Public Service Commission. The measure was favored by the reorganization committee of the United Railways, St. Louis, and was indorsed by the Board of Estimate of St. Louis.

Eastern Massachusetts Wage Demands Being Heard

Demands made by the union upon the Eastern Massachusetts Street Railway, Boston, Mass., for higher wages and better working conditions have become the subject of conferences. The men are asking for an increase in wages from the present rate of 54 cents to 70 cents, as the basic rate, and a differential of 8 cents in favor of the one-man car operators. This is an increase of 3 cents in the differential and would make the men's pay 78 cents an hour for operating one-man cars. Items are being taken up in the order of importance, or their relationship to the whole agreement. Present conditions are to continue until a new agreement is reached, but the new terms will be retroactive to May 1, the date of expiration of the old agreement.

Bus Regulatory Bill Fails in Missouri

The Missouri Legislature has adjourned without having passed any legislation affecting bus lines operating in the State. The bill introduced by Senator McCawley was amended repeatedly in both the Senate and the House, but it failed to be approved on final conference between committees of both branches of the Legislature. In consequence the cities will continue to exercise control over buses operating on their streets, while there is practically no regulation of the numerous bus lines in the country districts. The Legislature does not meet again for two years, unless called into special session by Governor Baker.

Ten-Cent Fare in Poughkeepsie

The Public Service Commission of New York on April 30 issued an order providing for a maximum cash fare of 10 cents to be charged by the Poughkeepsie & Wappingers Falls Railway. The order contains a provision requiring the company to sell at various public places in Poughkeepsie and Wappingers Falls six tickets for 50 cents, good where a 10-cent cash fare is charged.

The order maintains present reduced school tickets and provides for round trip fare between Poughkeepsie and Wappingers Falls of 40 cents and a round trip fare between Poughkeepsie and Kingwood Park of 30 cents. Last November the commission issued an order fixing a straight 9-cent fare. The rates were never put into effect by the company, however. The new schedule will represent a reduction for the regular car riders over the 9-cent fare provided last fall. It is estimated the new schedule will add about $22,500 to the operating revenues during the year.

The new tariff will remain effective until May 1, 1926.

Another Recess Committee to Study Boston "L"

The effort to secure legislation extending the public control of the Boston Elevated Railway twenty years failed in the Massachusetts Legislature, and a resolve was passed instead creating another recess committee to study the affairs of the company and bring in a report next year. Public control and operation cannot be terminated before 1928, but it continues automatically beyond that year unless it is terminated by affirmative action in the Legislature.

Municipal Road After More Detroit Lines

Ross Schram, general manager of the municipal railway at Detroit, Mich., says the matter of taking over transportation service from the Detroit United Railway to certain points in the Detroit metropolitan zone is being considered by the Detroit Department of Street Railways. The points to which the city of Detroit would extend service include Dearborn on Michigan Avenue, Halfway on Gratiot Avenue and Bedford and possibly Farmington on Grand River Avenue.

The Detroit United Railway is understood to be favorably inclined toward relinquishing its limited interurban service on Michigan Avenue east of Dearborn. The late president of the railway publicly expressed a desire shortly before his death that the municipal railway service be extended to Dearborn.

News Notes

Veterans' Club at Baltimore Celebrates.—The Twenty-five Year Club of the United Railways, Baltimore, Md., held its second annual banquet on April 30 at the Hotel Emerson. The club has a membership of almost 300. Several members have been in the employ of the United more than 50 years. William H. Staub, purchasing agent for the company, was elected president. He succeeds A. J. Dietz.

Sunday Rates During April.—The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, sold during April on Sundays round-trip tickets to any point on its line, far or near, for $1. For instance, the round trip from Waverly to Cedar Rapids costs $5.62 at regular fare, but on Sundays the cost was only $1.

Governor Signs One-Man Car Bill.—Governor Peay of Tennessee recently signed a bill which prohibits the operation of one-man cars in the larger cities of the state after Oct. 16, 1925.

Tells Public Railway Problems.—The Savannah Electric & Power Company, Savannah, Ga., in a series of advertisements in the *Morning News* is calling the attention of the public to all angles of local transportation so as to acquaint the people of the city and surrounding territories with the problems of the railway and impress them with the need for public co-operation.

President T. N. McCarter Makes Radio Address.—The radio was used to maintain the "personal touch" between workers and executives in big industrial enterprises recently when President Thomas N. McCarter of the Public Service Corporation of New Jersey enlisted the services of WAAM, Newark, to greet the 20,000 employees of the corporation. The latter part of April Mr. McCarter returned from the first long vacation that he has taken since he was instrumental in organizing Public Service, back in 1903. He wanted to thank the employees for their loyalty and faithful service, point out to them plans for the future and present to them some of the problems of the business.

Grade Warnings Discussed.—Representatives of many steam and electric railroads and of railroad signal manufacturing companies were present at a hearing before the Public Service Commission on April 16 on an order directing the railways to show cause why a standard form of automatic grade crossing warning should not be adopted. Under the present practice several types of automatic warning signals are installed.

Opposes Extension.—The New Brunswick Power Company, St. John, N. B., is opposing the demand made by real estate owners of Little River for an extension of the railway. Consideration of the plea of the property holders that the company be forced to extend the line has been deferred until May 27 by the New Brunswick Board of Public Utilities. The company says the expenditure is unwarranted.

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Weekly Tickets Still in Force.—The Worcester Consolidated Street Railway has decided to continue the sale of weekly pass tickets in Leominster, Mass., for unlimited riding another month.

Surface Line Advertises for Business.—The New York Railways Corporation, New York, N. Y., which on May 1 succeeded the New York Railways, at once began a campaign to divert traffic from the subway and elevated lines to its own cars. Windows of closed cars bore large placards in green type, reading: "Green lines save walking, waiting, stair-climbing. Ride in comfort." Signs inside the cars advised passengers that the "green cars" were preferable to the subway for trips of 50 blocks or less. Open cars bore similar placards, and in addition signs in front read "Ride in the open."

One-Man Cars for Des Moines.—One-man cars are soon to be tried by the Des Moines City Railway, Des Moines, Iowa. Definite surveys to determine the practicability of the plan are now being carried out with a view to the use of the cars on outlying lines. Collectors would be stationed at the crowded downtown corners during the rush hours to allow loading at both ends of the cars. The new plan will not be put in operation on any lines unless the service which is now rendered can be fully maintained or made more efficient.

Union Demands Inclusion of Bus Operators. — Representatives of the trainmen employed by the Northern Ohio Traction & Light Company, Akron, Ohio, demand that 102 Akron bus operators employed by the company be included in the working agreement between the company and the union.

Transit Bill Before Governor.—The Pennsylvania House of Representatives recently concurred in the amendments made by the Senate to the Little bill creating a Department of City Transit in Pittsburgh and Scranton. The Senate amendments made the creation of a department of this kind optional instead of mandatory with the councils of the two cities. Other amendments would make the appointment of five members by the Mayor subject to the approval of Council. The commission is given power to enforce laws of the state and city ordinances pertaining to transit facilities. The measure was sent to the Governor.

Cross Seats Will Be Abolished.—The Connecticut Company, Bridgeport, Conn., will gradually abolish the old style cross seat open car, according to Manager Potter. Cars of this type will be used only in an emergency.

Wants to Know About Men. — The Louisville Railway, Louisville, Ky., in a recent "ad" in a local paper solicits information about its employees. The company wants to know when one of its number performs any unusually polite or accommodating act in order that proper recognition may be given. If there are occasions when the platform men forget their instructions and are guilty of actions which are inconsistent with the service aims of the company, such definite facts are welcomed in order that corrective measures can be taken.

Elevated Platforms to Be Extended.—The directors of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., have approved an expenditure of $125,000 to extend the platforms at sixteen stations on the Fulton Street "L" so that seven-car trains may be operated in the rush hours instead of six-car trains as at present. Not long ago the New York Transit Commission directed the lengthening of all of the stations on the main line of the Fourth Avenue subway in Brooklyn. This would make possible the use of eight-car trains instead of seven-car trains.

May Operate Buses Without Certificates in Michigan.—Electric railways need not secure certificates from the Public Utilities Commission of Michigan in order to operate motor vehicles supplemental to or as substitutes for present service, according to a bill passed by the Legislature. In all other respects such operation is subject to the same regulation as independently operated vehicles. The consent of local authorities must be secured for local operation. The vehicles must be operated under the commission's regulations regarding equipment, speed, etc.

Foreign News

One-Day Strike in Paris

Transport employees at Paris, who ceased work on May 5 in some sections of the city decided to resume work on May 6. The strikers were informed by their delegates that the company had agreed to reinstate, without exception or punishment, all the men who quit their jobs on May Day. The 200 men who were under suspension are to receive pay for the two days they were laid off. The strike movement had extended on May 5 until more than half the employees of the street car and bus services were out. Carhouses and power houses were guarded by troops and a policeman was stationed on each car that operated, but no violence was reported.

British Municipalities and Buses

In pursuance of the movement of the Municipal Tramways Association to obtain fairer terms for running buses, as compared with those applying to bus companies, representatives of the association had an interview on April 1 with about a hundred members of Parliament and stated their grievances and desires, as had been set out at the conference held the preceding week. The leading statement was made by A. R. Fearnley, general manager of Sheffield Corporation Tramways. His conclusion was that where municipalities possess the necessary Parliamentary powers to operate tramways or railless trolley vehicles they should be allowed to operate buses where they think advisable, and in this respect have equal facilities with companies, and that where licenses to run buses are refused appeal should be to the High Court instead of to the Ministry of Transport. The views of the deputation appeared to receive sympathy from the members of Parliament and it was arranged to seek an interview with the Minister of Transport on the subject.

Paris to Extend Its Subway System

The French Senate has passed a bill authorizing the city of Paris to float a bond issue of 500,000,000 francs to provide funds to extend the subway system. The Senate reduced this bond issue from a figure of 620,000,000 francs voted last year by the Chamber. The funds will permit the following work to be done:

1. Extension of line 7 (Pré St. Gervais-Palais Royal) to the Choisy gate of the city.
2. Completion of line 10 (Invalides-Odéon) to the Bastille.
3. Prolongation of line 8 (Auteuil-Opéra) under the Grande Boulevards and the Boulevard Beumarchais to the Bastille.
4. Prolongation of line 9 (St. Cloud-Chaussée d'Antin) to the Picpus gate. This line, which will pass underneath the extension to the Boulevard Haussmann now under construction, will follow along line 8 to the Place de la République.

Owing to the failure of the Senate to authorize the full amount of 620,000,000 francs, the construction of lines 11 and 12 will have to be postponed. These lines as proposed were:

11, Porte des Lilas-Hôtel de Ville.
12, Porte d'Orléans-Porte de Gentilly.

A sum of 140,000,000 francs is now owed to the Metropolitan Subway Company and will be a first charge on the funds from the proposed bond issue of 500,000,000 francs.

Fare Reductions on London Underground. — The London Underground railway companies, wishing the public to use the railways rather than the buses for the longer distances, on April 1 put a reduction of fares into effect on many routes. In general 7d. fares were reduced to 6d., and higher fares for longer distances were reduced proportionately.

Barrow Changes to Railless. — A House of Commons committee has passed proposals in a bill promoted by the Barrow-in-Furness Corporation to authorize the conversion of the municipal tramways to railless electric traction, and the running of buses within the borough and on two routes outside.

Glasgow Fixes Maximum Fare from City Center.—The tramways committee of Glasgow Corporation has approved a recommendation to fix a maximum fare of 2d. for the conveyance of passengers to and from the center of the city. By the introduction of this fare it is expected that a way will be found to meet the keen competition from bus services in neighboring districts.

Receipts Higher.—In spite of the unfavorable weather of 1924 the receipts of the Brighton Corporation Tramways for the past twelve months show an increase of nearly £2,400 on the returns for the previous year.

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Financial and Corporate

Chicago "L" Does Well

Income Before Dividends $801,375 — More than 5,000 Employees Are Stockholders

Combined operating and non-operating revenue of the Chicago Rapid Transit Company, Chicago, Ill., for 1924 was $18,775,933. The total expenses, including taxes and retirement reserve, were $15,167,109. From the balance, $3,608,823, there was deducted for interest, rentals and amortization of discount $2,807,448, leaving as net income the sum of $801,375. Out of this net income dividends of $74,733 were declared and paid on the company's outstanding prior preferred stock, leaving $726,642 as unappropriated surplus earnings for the year, no interest having been declared or paid on the company's adjustment debenture bonds. To this surplus other credits of $232,030 were added, making a total surplus at the end of the year of $958,672. The expenses charged for the year include $239,608 credited to the retirement reserve account.

INCOME STATEMENT OF THE CHICAGO RAPID TRANSIT COMPANY
For the Year Ended Dec. 31, 1924

Passenger revenue		$17,504,220
Other transportation revenue		1,060,964
Gross operating revenue		$18,565,185
Operating Expenses:		
Maintenance of way and structures	$1,993,174	
Maintenance of car equipment	1,543,974	
Power	1,988,769	
Conducting transportation	7,036,998	
General and miscellaneous	1,196,735	
Total operating expenses		*13,759,650
Net operating revenue		$4,805,535
Taxes, city compensation, etc.		1,407,459
Operating income		$3,398,075
Non-operating income		210,747
Gross income		$3,608,823
Deductions:		
Rentals	$467,714	
Interest on mortgage debt and equipment obligations	2,244,167	
Interest, other	69,610†	
Amortization of discount	25,955	
Total		$2,807,448
Net income		$801,375
Dividends paid on prior preferred stock		74,733
Surplus earnings for the year unappropriated		$726,642
Other profit and loss credits carried to surplus		232,030
Balance surplus unappropriated, Dec. 31, 1924		$958,672

* Total operating expenses include $239,608 credited to retirement reserve.
† No interest declared or paid on adjustment debenture bonds.

During the year the lines carried 212,901,024 revenue passengers, considerably more than had been carried by the combined lines at any time in their history. In the month of December 19,460,549 revenue passengers were carried. This established a new high monthly record. For the year the average fare per passenger was approximately 8¼ cents.

On May 6, 1924, pursuant to authority given at a special meeting of the stockholders, the company's authorized capital stock was increased from $21,000,000 (all of one class) to $25,330,500, classified as follows: $5,000,000 prior preferred stock, $1,000 preferred stock and $20,329,500 common stock. In addition to the securities issued in January in connection with the acquisition of its properties the company during the year sold $9,000,000 principal amount of its first and refunding bonds, 6½ per cent series due 1944, and $4,363,300 par value of its prior preferred stock, series A, carrying dividends at the rate of 7.8 per cent per annum, payable monthly. Of the stock so sold $2,761,500 face amount was issued and paid for in full during the year. The remainder was sold on the installment plan and at the end of the year had not been fully paid for and had not actually been issued.

A portion of the proceeds of the sale of the bonds and stock was used (a) to retire $8,000,000 principal amount of first mortgage bonds of South Side Elevated Railroad which matured on July 1, 1924, and (b) to purchase $2,500,000 principal amount of first mortgage 5 per cent bonds of the Lake Street Elevated Railroad maturing on July 1, 1928, which bonds upon their acquisition were pledged under the first and refunding mortgage of the Chicago Rapid Transit Company. The rest of the proceeds will be used to pay for new cars and contemplated extensions and improvements. On Feb. 1, 1925, the entire authorized $5,000,000 of prior preferred stock, series A, had been sold. Of this total $1,348,900 par value was sold to 5,334 employees and members of their families.

Experts at Work on Detroit United Property

A letter to stockholders of the Detroit United Railway, Detroit, Mich., sent out by A. E. Peters, secretary, on April 28 states simply that plans are still under consideration and will be announced later.

Stockholders were advised by a circular letter dated March 10, last, that the company directors had under consideration a plan by which the necessary funds might be obtained to enable the owners to resume complete control of the property.

Before giving further consideration to this plan, it has been deemed advisable to ask an audit of the books and accounts of the company as to the date of the receivership.

It was also deemed advisable, the April letter states, to obtain a report from independent experts on operating and traffic conditions and possibilities, and on the financial commitments and probable capital expenditures required. As noted previously in the ELECTRIC RAILWAY JOURNAL, A. L. Drum & Company, Chicago, have been engaged for this purpose, and their preliminary report has just been received.

Indiana Interurban Inspected—Insulls Reported Interested

A committee representing bondholders of the Union Traction Company, Anderson, Ind., accompanied by several officials of the company, recently inspected the interurban lines. The committee, it is understood, will submit a report to the bondholders containing recommendations concerning action to protect their interests. Although it is denied that the question of the sale of the company is considered at this time, it has been rumored in utility circles that the Insull interests, operating the Interstate Public Service Company and other traction lines in Indiana, may eventually acquire the property.

Arthur W. Brady, receiver and president of the Union Traction Company, said the inspection had no relation to rumors that representatives of the Insull interests might bid for the property at receiver's sale. No court order for such sale has been asked. The receiver operates under the direction of the Madison Circuit Court.

$4,208,577 Reduction in New Orleans Rate Base

The rate base of the railway division of the New Orleans Public Service, Inc., New Orleans, La., was reduced in the sum of $4,208,577 by the assignment of this amount to the electric division of the corporation, in the adoption of the ordinance introduced by Commissioner Paul H. Maloney of the Department of Public Utilities. This was one of the last acts of the expiring Commission Council, the members of which went out of office on April 30.

Mayor McShane alone dissented in the vote of adoption. In a written statement, he said in part:

> While the original rate base of the corporation was settled upon Dec. 31, 1920, at $44,700,000 after more than fifteen months of investigation and discussion, this ordinance virtually indorses and establishes a new rate base at a much higher figure without any investigation.

He pointed out that under the new electrical department rate base it will be difficult to obtain a reduction in electric power rates.

Tort Creditors Treated Liberally

Under an agreement between the reorganization committee of the New York Railways, New York, N. Y., and the committee representing creditors from accident damages, worked out under the supervision of the commission, the creditors have two options of payment. Under one option they may receive two-thirds of the amount of their claims in cash or be permitted to accept in lieu of the cash payment 100 per cent of their approved claims in prior lien mortgage 6 per cent gold bonds, series A, an issue of which in the amount of $3,800,000 has been approved by the commission, under a general prior lien mortgage.

Another prerequisite to the reorganization which the commission regarded as of foremost importance and which it insisted upon, though without legal power to impose it upon the new com-

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pany, was the inclusion of a provision calling for the naming of public directors, nominated by the commission to the board of the new company. In the case of the B.-M. T. and Interborough reorganizations, because of the financial interest of the city under the dual contracts, the commission was in a position to insist upon the inclusion of public directors. In the case of the New York Railways Corporation, however, the reorganization committee agreed to the commission's suggestion and the commission has already nominated Samuel L. Martin and George Billings Gibbons as public directors.

The commission further insisted that ample provision be made for the amortization of discount on bonds within a period of fifteen years, a step regarded by the commission as in the direction of sound and scientific financing. This provision was also accepted by the reorganization committee on behalf of the new company.

Opinion on Stock of No Par Value in Indiana

Arthur L. Gilliom, Indiana Attorney-General, has submitted an opinion to Samuel R. Artman, chairman of the Public Service Commission, with respect to authorizing a public utility corporation to issue no par value common stock. Mr. Gilliom says that the commission in determining the value of the stock as the basis for assessing fees should consider evidence submitted by the utility corporation on this point, the books and records of the company and any other information that would indicate the value of the stock.

Mr. Gilliom said that the provisions of the Indiana law, which in certain contingencies places a value of $10 a share on no par value common stock, apply only for the purpose of determining the ratio of common stock that may be authorized to other authorized capital issues, but does not apply to the valuation of no par common stock as a basis of charging fees.

Mr Gilliom said that the commission is warranted in having the utility itself say what value it places on the stock. He said if evidence can be found in the books and records of such value this value should be taken. The burden of establishing the value of the no par common stock is on the utility, Mr. Gilliom said, and the commission is not bound to accept the valuation in the absence of supporting evidence.

A utility corporation, in appealing such a case, Mr. Gilliom said, could not show a clear legal duty of the commission to accept the value of the stock contended for if the utility had not provided the necessary information to justify such a finding being made by the commission.

Mr. Gilliom pointed out that there is no general rule to determine such value which would serve as a guide in all cases. He indicated, however, that in the instance of a merger where no par value common stock is exchanged for common stock of a determined value, the latter value would serve to indicate the value that might be asumed as a basis of charging fees of the no par value stock issue.

Remarkable Improvement in Earnings in Boston

Edward Dana, general manager of the Boston Elevated Railway, Boston, Mass., on April 28 made public the detailed statement covering the operations of the system for February. The improvement made over the similar month a year ago is so marked that some of the principal statistics of operation are presented in the accompanying statement.

RESULTS OF OPERATION OF BOSTON ELEVATED RAILWAY IN FEBRUARY

	1925	1924
Revenue exceeded cost of service	$118,183	$19,247
Ratio operating expense to operating revenue, per cent	67.36	72.23
Operating revenue per car-mile operated, cents	64.96	64 .10
Operating revenue per car-hour (A. E. R. A. standard)	$6.21	$6.06
Revenue passengers	29,826,343	32,525,051
Per cent 5-cent and 6-cent fare passengers	19.21	27.02
Average fare per revenue passenger, cents	9.200	8.649
Revenue passengers per car-mile operated	6.927	7.263
Car-miles operated	4,305,828	4,477,538
Trips operated	547,447	531,925
Direct-current kilowatt-hour output gross for month	22,474,915	27,475,975
Maximum kilowatt-hour load	84,580	84,650
Tons of coal consumed	20,130	26,627

Similarly, receipts of the Boston Elevated Railway for March were in excess of the cost of service. The March amount was $211,955. This brings the reserve fund up to $776,656, with $223,444 yet to be added before the required $1,000,000 can be reached.

Last November the reserve fund was $1,042,000 below the zero mark, while now it is more than $776,000 on the right side of the ledger. Among the economies effected was a reduction in the force of employees. This actually left the payroll the same as it was last year for nine months in spite of the increase in wages granted by the arbitration board.

Commission and Company Join Issue Against City of St. Paul

The State Supreme Court has under advisement the appeal of the Minnesota Railroad and Warehouse Commission and the St. Paul City Railway on an order to show cause why the commission should not file with the Ramsey County District Court the findings in an appraisal of $15,998,000 value for the company's property. This is part of a proceeding to determine a permanent rate of fare in St. Paul. The order was issued on March 9 by Judge R. D. O'Brien of the lower court and was made returnable on April 30.

The point at issue is whether the case is appealable. The commission contends that the proposed findings of the valuation of the St. Paul City Railway have not been signed by any member of the commission and no rate order has been issued. The Brooks-Coleman act, which places rate making with the commission, provides for appeal to the courts, but the commission has not yet made any appealable order, ruling or decision.

When the commission announced the tentative finding of valuation the city of St. Paul appealed to the District Court and the order was issued to file the findings with the court. This the commission refused to do. It was argued that a proceeding of this kind would throw the power of rate making into the courts, a contingency not contemplated under the terms of the act. The railway joined in the case.

Purchase Price at Seattle Held to Be Too Low

In further negotiations between the city of Seattle, Wash., and the Seattle & Rainier Valley Railway, looking toward the purchase of the railway by the city, Walter M. Brown, general manager of the company, pointed out further discrepancies in the city's appraisal of $1,045,547 for the lines. He declares this figure is low, but has not submitted a sum which his company believes equitable for the purchase of the lines. Mr. Brown declared that the figure for the company's tracks is $57,486 under their real valuation. City experts put the value of the company's tracks at $633,513.

Railway Earnings in Evansville Lower

The railway department of the Southern Indiana Gas & Electric Company, Evansville, Ind., was affected during 1924 to some extent by the unsettled business conditions during the summer in the Evansville territory. This fact was disclosed in the annual report to the stockholders. General operating results, however, were very satisfactory. Revenue passengers carried totaled 12,931,255 in 1924, against 13,935,605 in 1923.

SOUTHERN INDIANA GAS & ELECTRIC COMPANY

Gross earnings:	1924	1923
Electric	$1,214,619	$1,100,778
Railway	871,839	936,583
Gas	507,108	486,906
Steam heating	61,046	54,495
Total	$2,654,614	$2,578,764
Operating expenses and taxes	1,630,064	1,626,932
Gross income	$1,024,550	$951,831
Interest and other fixed charges	438,530	433,418
Net income available for dividends and depreciation	$586,020	$518,413
	Per Cent	Per Cent
Ratio of operating expenses to gross earnings	52.06	54.71
Ratio of operating expenses and taxes to gross earnings	61.40	63.09

SUMMARY OF SURPLUS ACCOUNT

Balance—Jan. 1, 1924		$434,854
Net income available for depreciation and dividends—Year ended Dec. 31, 1924 (as above)	$586,020	
Deduct—Provision for depreciation	207,000	379,020
		$813,874
Deduct—Sundry direct surplus charges (net)		17,589
Balance		$796,285
Less—Dividends:		
On 6 per cent cumulative preferred stock	$131,526	
On 7 per cent cumulative preferred stock	86,010	
On common stock	120,000	337,536
Surplus—Dec. 31, 1924 per balance sheet		$458,749

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The railway property embraces more than 70 miles measured as single track, 38 miles being the city system in Evansville and the remainder an interurban line extending north from Evansville to Princeton and Patoka. The equipment includes sufficient rolling stock, carhouses and shop capacity for city and interurban service.

Receiver Appointed for Indianapolis & Cincinnati Traction

Charles L. Henry, president of the Indianapolis & Cincinnati Traction Company, Rushville, Ind., has been named receiver for the company by the Circuit Judge at Rushville. His bond is fixed at $25,000. The company has been in financial difficulties for some time, and, according to Mr. Henry, the action was necessary to protect the creditors and conserve the assets. The company operates about 100 miles of electric railway in Indiana, one line running between Indianapolis and Connersville and the other between Indianapolis and Greensburg. Increased operating costs following the close of the war and decreased earnings due to business conditions and bus competition are given as reasons for the condition of the company.

Duluth-Superior Company Does Better

The Duluth-Superior Traction Company, Duluth, Minn., has gone in for employee-customer stock ownership, having recently placed $500,000 of 7 per cent preferred at 98. The company will use the funds to retire a similar amount of outstanding bonds.

Following the valuation of Duluth's property by the commission the company was permitted to collect a 6-cent fare, but had to surrender its franchise, expiring in 1931, for an indeterminate one. Under this arrangement operations have been profitable, and it is expected the common shares will be put on a 4 per cent dividend basis in July next.

Gross earnings for March were $166,934, an increase of $15,709 over the corresponding period of 1924. For the first quarter of the year gross earnings are up 9.2 per cent. Following is a comparison of earnings for the month of March and for the first quarter with those of the corresponding periods a year ago:

	1925	1924
March	$166,934	$151,225
First three months	502,629	460,360

Loss Reported on Railway at Athens.—The total revenue of the Athens Railway & Electric Company, Athens, Ga., for the year ended Dec. 31, 1924, was $403,682, while total expenses were $283,956. Net earnings, derived after operating expenses, taxes and rentals, were $119,725. A loss of $8,770 from the operation of the railway is shown in the report. The total revenue that was received from the railway for the year was $79,120, while total expenses were $87,891.

Hearing Held on Abandonment Petition.—Figures in support of their contention that the Anderson-Middletown branch of the Union Traction Company has been operated at a loss for several years were presented to the Indiana Public Service Commission on April 28 by officers of the company. The company wants to abandon the branch. The commission took the petition under advisement. No patrons of the line appeared at the hearing.

Seeks Partial Abandonment.—Abandonment and track removal is being sought by the Milwaukee Electric Railway & Light Company of a part of its Oakland Avenue line in favor of bus service. The company offers to operate bus service on a 30-minute schedule, replacing the present 45-minute schedule with no change in the present rate of fares.

Profit in March in St. Louis.—For the first time since November, 1924, the United Railways, St. Louis, Mo., for March shows a net profit in its operations. The gross operating revenues were $1,626,795 and non-operating income $21,044, a total gross income $1,647,839. Operating expenses, taxes, interest and miscellaneous charges were $1,626,295, leaving a net balance or profit of $21,544 for March. In October, 1924, the company's profit was $51,540 and for November, 1924, $14,011. December, 1924, and January, and February of this year all showed deficits. Col. Albert T. Perkins, general manager, said drastic economies had enabled the company to offset the large losses in revenue due to the competition of buses and private automobiles. The quarterly report for the period ended March 31 showed a decrease of 5,249,304 cash fares, compared with a similar period in 1924. For the last quarter 64,417,098 cash passengers were handled, compared with 69,666,402 in a similar quarter in 1924 and 66,344,240 fares for the quarter ended Dec. 31, 1924.

New Chicago Railway Directors.—At the annual meeting of depositories of capital stock of the Chicago Railways, Stanley Field, John W. O'Leary and C. J. Whipple were elected directors to succeed Bruce Borland, John E. Wilkie and J. M. Roach.

Par Value of Cities Service Reduced.—Stockholders of the Cities Service Company, New York, N. Y., have approved a change in the company's common capital stock by reducing the par value of the shares from $100 to $20 a share each. As a result of this change the directors intend to issue five shares of the new $20 par value stock for one share of the $100 par value stock now outstanding. At the same time the Cities Service Bankers' shares in denomination of $10 are exchangeable two for one of the new $20 par value common stock. The change in the par value of the stock has not affected the outstanding common stock capital of the company, which is approximately $71,000,000.

Book Reviews

Atlanta Local Transportation

Report to the City of Atlanta, Ga., on a plan for local transportation. By John A. Beeler. Published by the Beeler Organization, 52 Vanderbilt Avenue, New York City.

For permanent record the complete report on the local transportation situation in Atlanta has been published in book form. This report was abstracted quite fully in ELECTRIC RAILWAY JOURNAL for Jan. 10, page 55; Jan. 24, page 136, and Jan. 31, page 181. The bound volume includes the complete report with maps and charts, except for a mass of underlying data of local interest only.

Publicity—Some of the Things It Is and Is Not

By Ivy L. Lee. Published by Industries Publishing Company, 80 Lafayette Street, New York. 64 pages, $1.

Two addresses made by Ivy L. Lee are reprinted in this little volume. One of them was made before the American Association of Teachers of Journalism at Chicago on Dec. 30, 1924. The other was made before the annual convention of the American Electric Railway Association in October, 1916. The speech of 1916 attracted a great deal of attention. The points which were made in it are no less applicable now than they were then. The subject "Publicity as Applied to Public Service Corporations" is, in fact, even more pertinent now. Mr. Lee has a wealth of personal experience from which to draw, and those who have sought, consciously or unconsciously, to apply some of the advice he gave in 1916 can now measure the results in the light of their own experience. Some of the questions answered are: What is the difference between news and advertising? What is publicity? and What is propaganda—proper and improper? The volume may well be read and reread. It is really a desk book, both for the man who thinks he knows and for the man who knows not and knows that he knows not—a *rara avis* where publicity is concerned.

E M F Electrical Year Book for 1925

Edited by Frank H. Bernhard and a staff of contributing editors. 1,397 pages, 9x12, illustrated. Published by Electrical Trade Publishing Company, Chicago, Ill.

This is the fourth edition of the now well-known E M F Electrical Year Book, whose purpose is stated as "a complete classified directory of all electrical and related products, their manufacturers and trade names, with informative definitions of each class of products and catalog exhibits of the leading manufacturers." This year there has been a revision to prevent the book from becoming unwieldy. Articles of general interest and Canadian listings have been dropped, which have helped to keep the book within reasonable proportions. The encyclopedic classification is followed, so that electric railway topics are scattered throughout the book in alphabetical order.

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Personal Items

Messrs. Roberts and Fisk Consultants

General Manager for Receiver of Roads on Long Island and a Beeler Staff Man to Engage in Business for Themselves—Both Men of Wide Practical Training

TWO men well known in the utility field have joined forces to engage in consulting engineering work on transportation, traffic and power. They are E. A. Roberts and I. W. Fisk. Mr. Roberts is at present general manager for the receiver of the New York & Queens County Railway, the Long Island Electric Railway and the New York & Long Island Traction Company. Mr. Fisk has recently been with the Beeler organization. The new firm will have the corporate title of Fisk & Roberts. The New York office will be at 82 Beaver Street, which is in the downtown financial district.

With the railways on Long Island Mr. Roberts has rounded out in a responsible operating post experience that previously had been almost totally engineering in character and scientific and economic in its aspects. It furnished just the opportunity that he desired, did this work on the Long Island roads. Moreover, he knows better than ever before where practice and theory are likely to part company, but best of all it has been possible for him to confirm for himself the fact that the line of demarcation between scientific theory and the practical application of that theory is not so sharply drawn as the apostles of the rule-of-thumb school are inclined to believe. The consultant who has found these things out for himself is indeed in a position well nigh impregnable.

After all, Mr. Roberts' work on Long Island is only another addition to his long list of accomplishments. He has been general manager of the New York & Queens County Railway since Jan. 18, 1923; general manager of the New York & Long Island Traction Company since Feb. 3, 1924, and general manager of the Long Island Electric Railway since Nov. 1, 1924. Everything is relative, and the work of Mr. Roberts has to be viewed with the picture uppermost in the mind of the former state of decrepitude of these roads. In the light of their present condition, it seems indeed unkind even to refer to the matter. There certainly are times when it is advisable to let well enough alone. This appears to be one of those occasions.

Mr. Roberts formerly was chief of the transit bureau of the New York Transit Commission. Before that he had been assistant to John A. Beeler, consulting traffic expert, and during his connection with Mr. Beeler did intensive work in the supervising of electric railway operations. After he joined the Beeler organization in 1917 Mr. Roberts served with the Massachusetts Public Service Commission in the investigation of operating methods and practices preceding state control of the

E. A. Roberts

Boston Elevated Railway, and with the Public Utilities Commission of the District of Columbia. His work there was to increase the capacity of the Washington railway systems under war conditions. He also made extensive investigations for the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey.

After he was graduated from Harvard College in 1914 Mr. Roberts spent two years with the General Electric Company at Lynn, Mass., and Erie, Pa., in departments connected with the manufacture of electric railway apparatus. During 1916-17 he was a research member of the faculty of the railway engineering department of the University of Illinois, and for a short time thereafter he was associated with the Boston Elevated Railway in its electrical engineering department.

Mr. Fisk's experience in the electric railway industry covers the fields of financial and operating investigations of traffic and power conditions, as well as appraisal work, in Philadelphia, Kansas City, St. Louis, Syracuse, Des Moines, Wichita, Topeka, Danville, Champaign, Urbana, Colorado Springs, Galesburg and Jacksonville. He was graduated from the University of Illinois, department of electrical engineering, in 1909, was a member of the engineering faculty from 1909 to 1918 and was assistant professor during 1917 and 1918. During this period Mr. Fisk was consulting engineer for many corporations and municipalities in the Middle West and consulting engineer for the Champaign-Urbana Water Company in 1916, 1917 and 1918. In the fall of 1918 he took charge of the engineering school at the Drexel Institute of Technology, Philadelphia, Pa., and organized and directed the Student Army Training Corps at that institution.

In the spring of 1919 Mr. Fisk joined the Beeler organization, with which he has since been associated with the exception of one and a half years as general manager of the water, light and power properties at Springfield, Ill. During this period these light and power properties were rehabilitated and enlarged and a complete electrical distribution system for the city constructed. Mr. Fisk introduced many operating economies in the plant, making material reductions in the cost of energy.

I. W. Fisk

H. P. Bell Made Chief Engineer Key System

H. P. Bell, appointed chief engineer of the Key System Transit Company, effective on April 6, has been closely identified with electric railway work since 1907. He received his early experience with the Utica & Mohawk Valley Railway, the Utica city lines and Syracuse city lines, now included in the system of the New York State Railways. Mr. Bell was also active in the electrification of the West Shore Railroad between Utica and Syracuse, N. Y., then known as the Oneida Railway.

In October, 1910, he became connected with the Oakland Traction Company, Oakland, Cal., as an electrical test man. As the Key System Transit Company absorbed the Oakland Traction Company in a general merger of eleven different properties, Mr. Bell systematically earned promotions from test man to foreman, to supervisor, to assistant engineer, to electrical engineer and now to chief engineer in full charge of all engineering matters of the consolidated properties, with headquarters in Oakland.

Mr. Bell was born in Trinidad, Cal., on April 23, 1885, and received his early education in the public schools of California. Later he attended Leland Stanford University, Berkeley, Cal.; Syracuse University, Syracuse, N. Y., and Cornell University, Ithaca, N. Y. At the latter institution he specialized in electric railway and power work.

He is a member of the American Electric Railway Association, American Institute of Electrical Engineers, American Society for Testing Materials and the Pacific Railway Club.

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H. R. Stamm Leaves Industry

Architect of the Connecticut Company Goes Into Consulting Work in New Haven

H. R. Stamm has resigned as architect of the Connecticut Company, New Haven, Conn., to become connected with W. R. Foote, New Haven, one of the best known architects in the State. In many respects Mr. Stamm is no less an engineer than he is an architect, but his leanings are more toward architecture than they are toward engineering. He has served the Connecticut Company acceptably through two terms of employment, but feels that he will, perhaps, be afforded a wider scope for his talents in the purely architectural field than would be possible under conditions in which architecture and engineering must necessarily be combined, as is the case in railway and industrial work.

Mr. Stamm is a technician in the fullest sense of that word. He was born in Basel, Switzerland, in 1884. He attended the local schools there and was graduated in 1907 from the technical college at Bern with the degree of engineer of building construction. Not satisfied with these honors he studied architecture at the University of Stuttgart for two years and took the final examinations in both architecture and art.

His professional career began in 1910. Mr. Stamm served first with the architects for the French government and then went into business with his father, an architect in Basel. In May, 1914, he came to the United States. Here he worked first for the Austin Company at Bridgeport. In 1915 he went with the Connecticut Company as a draftsman and remained with the company three years. Meanwhile he took up ship construction work in his spare time and then entered that field with the Ship Construction & Trading Company at Stonington, Conn. During the war-time period he served with several ship and engine concerns, principally near New London. In 1921 he returned to Switzerland for a visit which was protracted for nine months. Part of this time was consumed on a mission for the Chamber of Commerce for the city of New London which had for its purpose a project for arranging a commercial steamer line to ply from Hamburg to New London and thence to Columbia, South America. This project involved an interview by Mr. Stamm with the late Hugo Stinnes. It failed to materialize only because the city of New London found it impossible to meet the conditions which Mr. Stinnes regarded as essential to the success of the undertaking.

Designed Many Notable Structures

On his return to the United States Mr. Stamm re-entered the service of the Connecticut Company. During this period of his service he has designed a number of notable structures for the company, among them the Grand Avenue garage in New Haven at a cost of $120,000, a modern paint shop at Waterbury at a cost of $57,000 and a new carhouse and operating building at Waterbury at a cost of $400,000. Mr. Foote was engaged as consultant on this last-mentioned work, and as a result of the association Mr. Stamm entered Mr. Foote's employ.

Mr. Stamm is chairman of the committee on engineering symbols of the American Electric Railway Association, is serving on the committee of buildings and structures of the American Electric Railway Engineering Association, and is chairman of the sub-committee on bus terminal designs.

As an avocation Mr. Stamm turns to music, in which he was educated abroad. Thus Mr. Stamm is an architect, an artist and a musician and in addition, as so often is the case with men trained abroad, he is a linguist with a ready command of several languages.

Chairman Lyman of Brooklyn City Railroad Resigns

Frank Lyman has resigned the chairmanship of the Brooklyn City Railroad, Brooklyn, N. Y. No successor has been named for the office. George W. Jones, vice-president and treasurer, was made a director. Mr. Lyman was president of the Brooklyn City Railroad up to the time of the election of H. H. Porter, the present incumbent. When he turned over the presidency the position of chairman of the board was created especially for Mr. Lyman.

Mr. Lyman's withdrawal from the chairmanship is in keeping with a plan he has had in mind for some time. His connection with the Brooklyn company covers a period of many years, during a large part of which the Brooklyn City Railroad was operated under lease by the Brooklyn Rapid Transit Company, the predecessor of the present Brooklyn-Manhattan Transit Corporation. Following the return of the Brooklyn City Railroad to its owners after default in the terms of the lease by the old Brooklyn Rapid Transit Company Mr. Lyman entered actively into the affairs of the company, the corporate activities of which had been maintained during the period of the lease principally to permit the company to act as a disbursing agent for the rentals received. Mr. Lyman is essentially a financier. He is an officer of many Brooklyn and Manhattan financial institutions.

H. C. Donecker, formerly assistant general manager of the Public Service Railway, Newark, N. J., has become connected with Kelly, Cooke & Company, Philadelphia, Pa., operators of the Chester Valley Lines, a co-ordinated railway and bus system.

Louis Hinds has been appointed cashier of the Morris County Traction Company, Morristown, N. J., succeeding W. D. Dalrymple. Mr. Hinds has been in the employ of the company since Sept. 5, 1918, serving as trainman and dispatcher.

William D. Dalrymple has been appointed auditor of the Morris County Traction Company, Morristown, N. J., succeeding H. C. Robbins, resigned. Mr. Dalrymple has been in the employ of the company for the last thirteen years. He started as storekeeper and was promoted to chief office clerk and paymaster and later was promoted to cashier and assistant auditor.

Obituary

A. O. Backert

A. O. Backert, president of the Penton Publishing Company of Cleveland, Ohio, and for a number of years on the editorial staff of *Iron Trade Review*, died April 24 at the age of 49 years. Mr. Backert was not technically educated, but he learned early in his editorial life the value of study of his specialty and he long since became known as an expert, not only in the business of iron and steel but also in its technology. In his later life when his administrative duties as head of a large publishing company made it impossible for him to continue close editorial contact with his field, he still retained the confidence of the industry and improved every occasion to capitalize that confidence in advice and suggestion to his editorial associates.

Mr. Backert attended Western Reserve University. After some years of newspaper work he joined the staff of *Iron Trade Review* and the *Foundry*, with which he remained until 1906, when he became Western editor of *Iron Age*. In 1908, however, he returned to the *Foundry*, of which he became editor, and *Iron Trade Review*, of which he was engineering editor. In 1913 he became vice-president and general manager of the Penton Publishing Company and in 1924 its president.

Edward Goepper, eldest member of the board of directors of the Cincinnati Street Railway, Cincinnati, Ohio, died at his home in Avondale on April 22.

Col. Lewis Perrine, 65 years old, died on May 3. Of his many activities, Colonel Perrine was best known for his connection with the old horse railways in Trenton and the electrification of those enterprises. His father, the late Gen. Lewis Perrine, was president of the Trenton Horse Railroad. Colonel Perrine was elected secretary-treasurer of the company in 1881, and subsequently was made general manager. In 1891 he purchased the City Railway and consolidated the two companies under the title of the Trenton Passenger Railway. For fifteen years he managed the company. In 1881 Governor Ludlow appointed him assistant quartermaster-general, with the rank of colonel, and he was reappointed by Governor Abbott three years later. He declined the position of quartermaster-general of the state to succeed his father.

Almet N. Broadhead, president of the Jamestown Street Railway, the Chautauqua Traction Company and the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y., one of the best known industrial leaders of western New York, died at his home in Jamestown on May 5, at the age of 74 years. Mr. Broadhead was president and held the controlling interest in many of Jamestown's industries, including the Jamestown Worsted Mills and the Broadhead Worsted Mills, the two largest textile industries in the city. He also had large holdings in the local and interurban electric lines of Chautauqua County and in the Chautauqua Lake Navigation Company.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Double-Deck Buses for Detroit

Many interesting features have been incorporated in the fully inclosed double-deck bus built for, and in co-operation with, the Department of Street Railways, city of Detroit, by the Yellow Coach Manufacturing Company, Chicago. The upper deck and rear staircase are completely inclosed. The lower deck roof is of the monitor type, giving a 74½-in. headroom over the aisle. The over-all height is 12 ft. 8 in.

The body seats 57, 26 on the lower deck and 31 on the upper deck. It is carried on the standard type "Z" Yellow chassis having a 230-in. wheelbase and a six-cylinder, sleeve valve engine. Westinghouse air brakes on the rear wheels are controlled by a pedal.

Lower deck seats are spaced on 30-in. centers. There are eleven cross seats and two longitudinal seats.

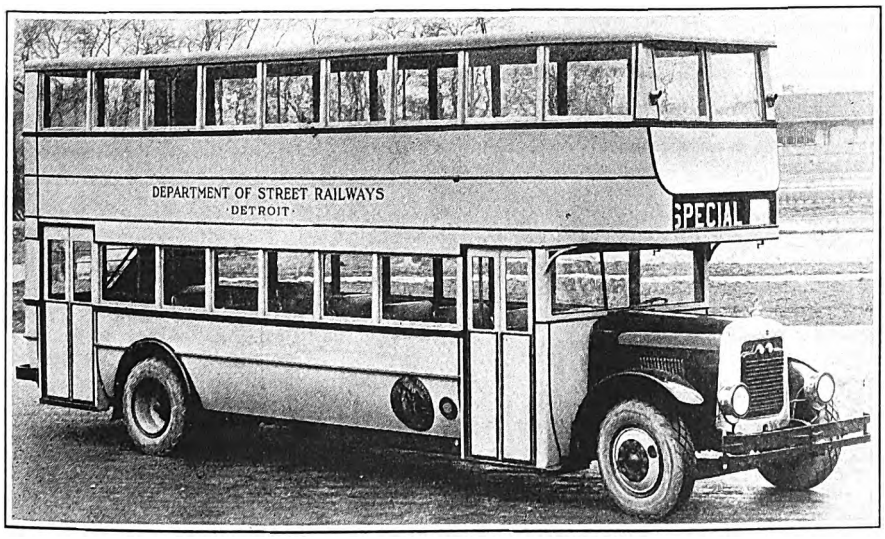
With two back-to-back seats placed down the center of the upper deck, the aisles on each side are directly over the lower-deck seats. This arrangement permits a saving in over-all height of 18 in. The upper-deck roof is ¼-in. plywood without carlines, supported at the sides by a narrow side strip carried on the side posts. A light beam down the center, supported by stanchions mounted along the seat back, stiffens the roof. The upper-deck headroom is 69 in. over the aisles.

Interior finish of side posts, panels and trim is mahogany. The ceilings of both decks are finished in stippled white. Seats are upholstered in brown Spanish leather. Brown battleship linoleum is used on the lower floor. Upper deck aisles are covered with anti-skid runners.

Ten opal glass dome lights with 21-cp. lamps are mounted in the monitor risers, five on each side. The upper deck is lighted by eight lamps of the same type, spaced down the center of the ceiling and set flush.

External appearance has been given particular attention. A streamline effect is carried from the front to rear. The two doors follow the lines of the body in the position of sash and step. At the rear the curve is continuous rather than flat. The upper deck side posts slant in a slight amount and the roof has a particularly flat curvature.

Two jack-knife folding doors serve the lower deck. The forward door is controlled by the driver. It incloses a single step to the front entrance space. The driver's position is close to the left side of the body. The rear door may be operated by the conductor, or it may be locked for one-man operation.



Fully Inclosed Double-Deck Bus Has Front and Rear Entrance, Inside Stairway and Leather Upholstered Seats. It Seats 31 Upstairs and 26 Below, with Over-All Height of 12 Ft. 8 In.

Future Lumber Supply Assured

The available stands of merchantable Southern pine timber since 1919 have decreased from about 260,000,000,000 board-feet to 220,000,000,000 board-feet, and production has increased to such an extent that the 1924 cut was approximately 16,000,000,000 ft., which is close to the maximum production for any year. These are the two outstanding facts revealed in the detailed survey of the Southern Pine producing territories by the Southern Pine Association undertaken approximately a year ago. The survey is the second it has made in the past five years. New tree growth is estimated at about 7,000,000,000 ft. a year, which deducted from the annual average cut (1919-1924) of 15,000,000,000 ft., means a yearly reduction during this period of 8,000,000,000 ft. The survey indicates that there is assured a perpetual supply of Southern pine in volume at least equal to one-half the present production.

Public Relations Messages Reprinted by Westinghouse

During past years the Westinghouse Electric & Manufacturing Company has been responsible for regular appearances of public relations good will advertisements in several of the leading popular media of the country. Its past endeavor in this direction the company has now crystallized in the reproduction in color of eighteen of these public relations messages in a special publication "Adequate Transportation Facilities, the Basis for Industrial and Social Progress—Telling the Public the Facts."

The messages incorporated in the type of advertisements that have appeared are intended to impress on the mind of the public the fact that the transportation system is dependable and that because of this the public should encourage and support the electric railways. By these messages also the public has been acquainted with the problems of this utility from several angles. Many expressions of appreciation have tended to strengthen the company's faith in this work with the result that it is now proposed to keep on with the program.

Any railway has the privilege of using the messages contained in the book in the interest of its own service.

New Selden Truck Corporation Formed

A new Selden Truck Corporation at Rochester, N. Y., has just been organized and will continue without interruption the manufacture, sale and service of Selden trucks which was begun in 1913. The former Selden Truck Corporation, which was formed in 1919 by consolidating the Selden Motor Vehicle Company and Selden Truck Sales Company, has been legally dissolved.

The management and operations of the Selden plant will be continued by the former executives. The Fabric Body Corporation, Detroit, the new owners of the Selden Truck Corporation, will act as holding company.

Fabric bus bodies will shortly be built in the Selden plant at Rochester.

The new corporation is amply financed to carry on the rapidly growing business in buses and motor trucks and production has already been increased to take care of the largest number of unfilled orders since the spring of 1920.

Metal, Coal and Material Prices

Metals—New York	May 5, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.75
Zinc, cents per lb	6 925
Tin, Straits, cents per lb	54 00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.175
Somerset mine run, Boston, net tons	2.075
Pittsburgh mine run, Pittsburgh, net tons	1 825
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1 875
Kansas screenings, Kansas City, net tons	2 625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6 50
Weatherproof wire base, N.Y., cents per lb.	18 25
Cement, Chicago net prices, without bags	2 20
Linseed oil (5-lb. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0 1575
Turpentine (bbl. lots), N. Y., per gal	$1 03

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Bus Business Reported Good by Pierce-Arrow

Production and sales of Pierce-Arrow buses are double this year what they were in the same period for 1924. Pierce-Arrow officials ascribe the increase in sales of commercial vehicles to better business conditions and a more complete knowledge of the value of Pierce-Arrow equipment in both the truck and bus field. Another factor in the growth of the commercial vehicle business is the increase in hard-surfaced highways.

Rolling Stock

Southern Public Utilities Company, Charlotte, N. C., will soon receive the last two of the six new cars ordered for Greenville, S. C., and referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 11, page 606. The bodies were built by the Perley A. Thomas Car Works, High Point, N. C. They will be mounted on Brill trucks. They are double-truck safety cars intended for one-man operation. Each car is 40 ft. long, weighs 32,000 lb., seats 46 passengers and is equipped with Ohmer registers. Double doors permit passengers to load while other passengers are being discharged.

Bloomington & Normal Railway & Light Company, Bloomington, Ill., has ordered six city-type Mack buses.

Lehigh Traction Company, Hazleton, Pa., recently ordered ten 25-passenger city-type Mack buses.

Omaha & Lincoln Railway & Light Company, Ralston, Neb., has ordered a 25-passenger Mack city-type bus which is to be placed in service on its 4-mile route between Ralston and Omaha.

Jacksonville Traction Company, Jacksonville, Fla., is expecting delivery on two new cars by June 1.

Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, has purchased two 25-passenger Mack buses for its Cedar Rapids-Tipton line. The new buses are similar to the one that has been operating.

Kentucky Traction & Terminal Company, Lexington, Ky., has just purchased four White 25-passenger buses for a loop line in Lexington. They will be fitted with Kuhlman bodies.

Track and Line

New York, Westchester & Boston Railway, New York, N. Y., has awarded a contract to Dwight P. Robinson & Company, Inc., for the extension of its double-track electric system from Larchmont to Mamaroneck.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has been urged to extend its double-track system on Vliet Street from 47th Street west to 60th Street in a resolution now under consideration by the Common Council.

Cincinnati Traction Company, Cincinnati, Ohio, contemplates spending $500,000 for track reconstruction and $250,000 for track maintenance and repairs in the next seven months.

Rome Railway & Light Company, Rome, Ga., is extending its line along North Fifth Avenue to Alabama Road.

Morris County Traction Company, Morristown, N. J., is rebuilding 1 mile of double track at Springfield, N. J. New 6-in. T-rails and International steel ties are being laid in concrete. The company is also arranging to rebuild and repave 1 mile of track in Summit, using steel ties. This road is also to be laid in concrete.

Dallas Southwestern Traction Company, Dallas, Tex., through its counsel, has filed an application at Washington for authority to construct a new line from Commerce Street, Dallas, through West Dallas, Cement City, Harry's, Gates Eagle Ford, Kits, and terminating at Irving, Tex., a total of 10.4 miles of main track, with no branch lines. The road would finance the undertaking by a bond issue of $1,250,000.

Wisconsin Power & Light Company, Fond du Lac, Wis., plans to replace the present 60-lb. rail with new rails of the 80-lb. type on new ties from Fond du Lac, Oshkosh and Neenah.

Houston Electric Company, Houston, Tex., plans to extend its Woodland Heights line into the Brooksmith addition.

Trade Notes

J. G. White Management Corporation, New York, announces the removal of its offices to the Federal Reserve Bank Building, 33 Liberty Street, New York.

American High-Speed Chain Company has appointed E. G. Long Company, New York, selling agents in New York and vicinity. Sales promotion will be in charge of Wilbur E. Petty as heretofore.

Haskelite Manufacturing Corporation, Chicago, Ill., has opened a branch office at 152 West 42d Street, New York City. James J. Dunne, Eastern representative, will be in charge.

Acme Wire Company, New Haven, Conn., has removed its sales office from 53 West Jackson Boulevard, Chicago, to 427 West Erie Street, Chicago, where a warehouse will be opened carrying stocks of all Acme wire products as an added service to customers who are now being served by this district sales office.

Industrial Works, Bay City, Mich., manufacturers of locomotive cranes and crane equipment, announces the opening of two new district offices, one at 425 Whitney Central Building, New Orleans, La., in charge of John A. Abele, district sales manager, and the other at 843-A Hurt Building, Atlanta, Ga., in charge of John J. Murphy, district sales manager. The works also announces the appointment of four additional district sales engineers. Dougles J. Calder, Conway J. Neacy and Monroe J. Frankel will have offices at the Chicago district office, 1051 McCormick Building, and Chester F. Delbridge will be at the St. Louis district office, Railway Exchange Building.

National Carbon Company, Inc., New York, N. Y., has just moved its emergency brush finishing plant into new quarters at 357 West 36th Street. For the past two years this plant has been maintained at 237 East 41st Street. The company states that the new location gives larger quarters which have become necessary to take care of the increasing volume of this class of service. This is only one of four similar emergency stations maintained by the National Carbon Company as auxiliaries to its main factory in Cleveland, Ohio. The others are located at Pittsburgh, Pa.; Chicago, Ill., and Cleveland, Ohio.

Electric Service Supplies Company, Philadelphia, Pa., announces the opening of a branch sales office in the General Motors Building, Detroit, in charge of Harry A. Stone. This office has been opened so that the constantly increasing business in that territory can be handled to better advantage.

Standard Steel Car Company and subsidiary companies announce the removal of their New York offices to 120 Broadway, Rooms 2103-2113.

Garford Motor Truck Company, Lima, Ohio, has announced the election of C. M. Allen to the presidency to succeed E. R. Curtin.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., announces an opinion by the United States Circuit Court of Appeals for the Second Circuit in New York City in the case of Vapor Car Heating Company, Inc., and Egbert H. Gold against Gold Car Heating & Lighting Company and Edward E. Gold, rendered April 6, in which all of the three Judges of the court unanimously held invalid U. S. Patent No. 886,969, dated May 5, 1908, owned by the Vapor Car Heating Company, Inc., broadly covering the heating of cars by the vapor system.

Sullivan Machinery Company, Chicago, Ill., has removed its Dallas, Tex., office from the western Indemnity Building to rooms 522-523 Santa Fé Building. Sullivan air compressors and hammer drills and repair parts are carried in stock in the same building. Additional space and shipping facilities, thus provided, will permit improved service for the customers of the company in territory served by the Dallas office. David H. Hunter is manager. The company announces the appointment of Earl E. Miller as manager at its El Paso, Tex., branch office, succeeding R. S. Weiner, who is transferred to the general office in Chicago.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 24 on "Arktite" circuit-breaking plugs and receptacles.

J. E. Loudon & Company, Boston, Mass., has issued a booklet on Mahanite bearings, called "They Stay on the Job."

American Electrical Works, Phillipsdale, R. I., has issued a 200-page illustrated booklet in loose-leaf form with a leather cover, describing in detail the products manufactured under the trade name "Amelectric." The book contains tables, data and general engineering information. A short history of the company is included.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 65 | New York, Saturday, May 16, 1925 | *Number* 20

Thorough Repairs Are Cheapest Eventually

CHECKING over costs for maintaining motors for electric railway service, the advantage of having a sufficient number of spare parts to give ample time for a thorough job of repairs is conspicuous. In the maintenance of railway equipment first cost is frequently given too much consideration. In order to keep cars in service a damaged armature may be hurriedly patched up and put in the motor frame, whereas if a spare armature or spare motor were available additional time would be taken to make a thorough repair job. The car receiving the hurriedly repaired armature soon comes back into the shop for motor trouble. Frequently trouble develops in other parts of the equipment as the result of the hurried workmanship. Records of motor trouble in some instances show that the same motor has been worked on three or four times in as many months. When the costs of bringing the car into the shop and jacking it up so as to remove the motor and the additional loss from service are considered, the resulting expense will be much greater.

Comparison with records of roads which have ample spare equipment shows that the extra equipment soon pays for itself in lessened maintenance cost. In order to reduce the number of spares required to permit efficient repair work to be done, one railway is using the trucks and motors from cars which are in for general overhauling and painting to replace similar parts that have developed defects in service. These cars remain in the shops from one to two weeks and before this system was adopted these trucks, together with the motor equipment, were idle during the entire period. Now as soon as a car is placed in the shop and the truck motors are removed the motors are used as spares to facilitate overhauling of other cars as they come in. When the cars are ready to be returned to service after the general overhauling other cars being brought in furnish spare equipment. Such a scheduling of repairs and reuse of the motors as spares is well worth consideration.

Well-Maintained Shop Tools Increase Production

SHOP forces of electric railways are schooled in the necessity of high-class maintenance of cars and equipment, so that the value of regular and systematic inspections is well appreciated. But when it comes to the maintenance of shop tools there are very few railways where regular inspections and repairs are made of these important pieces of machinery. In poorly managed shops repairs are not made until the equipment breaks down. Frequently lost time must be made up by overtime work in order that cars may be returned promptly to service. A half hour lost through a broken belt on a machine tool or a derailed overhead hoist frequently causes enforced idleness of several men. As an example of a different kind, a lathe with worn ways produces inaccurate work. No matter how good a machinist the workman may be, a poor fit is made, increased wear of the equipment results after it is placed in service, and removal and replacement become necessary after a shorter interval than would otherwise be necessary.

A well arranged shop will have in its organization a man designated to have supervision over the machine tools, and see to it that repairs are made before failures result. Regular periods of inspection should be established. Each machine should be gone over carefully, and any worn-out or broken parts renewed or replaced as an insurance against failure. Such a system would establish standards for doing the various types of work that are necessary in maintaining the shop equipment. Shafting and loose pulleys should be oiled at regular intervals, as a preventive of hot boxes or increased friction. The wear of moving parts of the machine tools themselves should be checked and adjustments made so as to insure accurate work.

A record of the repairs made to shop equipment and the intervals at which such repairs are necessary will also disclose valuable information. Such a record should also be invaluable when new tools are to be purchased, as it would include information pertaining to parts liable to failure, and so disclose weaknesses in construction capable of remedy in new designs. In large shops the organization should be so arranged as to take care of the inspection and repair of the tools, and individual men should be assigned to each class of work. In small shops one man may be designated to look after all the machine tools. This person may solicit the co-operation of the foremen in charge of the various departments. Through proper team work of this sort many machine failures will be eliminated.

Co-operative Buying Has Possibilities for the Smaller Railways

PURCHASING material in large quantities is a well-known and widely practiced method of securing price reductions from manufacturers. While the method is widely and successfully used by large concerns, it does not work out so well when only small quantities are needed. From the point of view of the small electric railway it is open to the objection that when the material purchased is consumed slowly, a considerable sum of money is likely to be tied up in the storeroom. Yet such a company is the very one to which the economy of buying wholesale has the greatest appeal.

One possible way out of the difficulty is co-operative buying. This principle has been successfully practiced by a number of the larger systems which really are only combinations of several smaller railways in separate towns. By having all purchases made through a single

This is the issue in May that is devoted essentially to maintenance subjects

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agency at the company headquarters the volume of business has been sufficient that extremely favorable prices have been obtained. The total quantity of material, however, was not much in excess of the current needs of the several divisions, and no great amount of capital was tied up in purchases made in large lots.

A similar plan could be followed by a number of independent railways in the same territory. The lower prices which could thus be secured would be a strong inducement to the individual managers to waive certain details of their own particular specifications.

Against the idea of co-operative buying it may be argued that the advantage of doing business with local merchants would be lost. If their prices were higher than those secured by a common purchasing agent, this might be the case. In reality, the local seller would be likely to reduce his price to keep the business. Thus the mere existence of the co-operative plan would achieve savings for the railways.

Three Years of Municipal Ownership

THREE years ago on May 15 the city of Detroit, Mich., took over the local lines of the Detroit United Railway. Previously the city had built about 50 miles of electric railway as a nucleus of a more extended municipal system. So far as matters between the city and the private company were concerned they had come to an impassé. With the rights and wrongs there is no concern at this time. Detroit made its choice. That choice was for municipal ownership and operation. To use a mixed mataphor, municipal ownership at Detroit is sailing the sea and riding the waves almost perfectly. It may be that the boat will later go aground. If it does, it will only be following the course of many similar municipal enterprises, but there is no evidence now of any gathering storm.

The Detroit management has done many progressive things. It has built well for the future. Perhaps the circumstances were unduly auspicious, but good opportunities are not in themselves an open sesame to achievement. Detroit has been able to spend money freely. But if it has spent freely, it has also spent wisely. Much of the work done there has been the subject of comment in these pages. A good idea is a good idea no matter by whom conceived. And some of the ideas at Detroit have blazed new paths not only in engineering, but in the sale of transportation.

There is a school of thought to the votaries of which the very words "municipal ownership" and "municipal operation" are anathema. For their benefit it should be made plain that ELECTRIC RAILWAY JOURNAL holds no brief for municipal ownership—much less municipal operation. It still thinks that with the proper private management Detroit would be much better off than it is today. This occasion demands only that criticism be fair. The Detroit management built up a personnel drawn largely from the ranks of skilled operators previously engaged on private enterprises. In that respect the Board of Street Railway Commissioners acted wisely. Perhaps that accounts largely for the progress made. These men, many of them active members of the American Electric Railway Association, have given to their employers—in this case the city—the best that is in them. There certainly is more than a morsel of pride to the industry in this fact. The men not so drawn have shown themselves to be most readily adaptable to new surroundings. All of these men may be expected to function efficiently only so long as there is no attempt at domination from outside sources. These are the conditions under which they functioned in private enterprises. When the bird of political patronage flies in at the window the competent ones will begin to go out by the door. It is anybody's guess how long it will be before that event takes place.

Open Shop Case at Cleveland Commands Attention

EMPLOYEES of the Cleveland Railway have voted not to go out on strike in an effort to enforce their demands for an increase in wages of 10 cents an hour. It is a wise move. It is also the latest development in Cleveland in the controversy between the railway and the Amalgamated. As news it is entitled to a place in the first paragraph, but there is more to the matter in Cleveland than that—a great deal more—significant as was that vote, taken by itself.

Even more important, however, is it that hereafter the Cleveland Railway will be operated on the open shop basis. The declaration of the open shop followed only after the issue had been fought out in the courts. It is impossible here to follow all the moves in this year-old controversy. Suffice it to say that the company a year ago rejected an award to the men of 12 cents an hour—they had asked 15—by an arbitration board on the ground that the key arbitrator, a former street railway commissioner of the city, was biased against the company. The union asked the court to uphold the award. Finally, the Court of Appeals not only held the 12-cent wage award illegal, but also set aside the closed shop contract between the company and the men on the ground that it was contrary to public policy. The Supreme Court sustained the ruling. In its comment on the law of contracts the learned court said:

> Contracts by which an employer agrees to employ only union labor are contrary to public policy when they take in an entire industry of any considerable proportions in a community so that they operate generally in that community to prevent or seriously deter craftsmen from working at their craft or workmen from obtaining employment under favorable conditions without joining a union. And such was the contract here, and it must necessarily be held to be in conflict with the public policy of our law, and illegal and void. The universal trend of authorities supports this position.

The entire discussion of the case by the court is of interest, but particular significant is this paragraph. The court decision is not a blow against collective bargaining nor against the fundamentals of unionism. It does, however, mean an end in Ohio at least to closed shop agreements in the electric railway industry.

For pushing this case through to a successful conclusion the electric railway industry is indebted to John J. Stanley, president of the company, and to Paul Wilson, its secretary. Mr. Stanley is not given to domination. Neither is he the kind to stand by and accept domination. He has announced an increase in pay of 5 cents an hour and has stated that in the future controversies will be settled by conference between company officials and employees of the company chosen by the employees themselves.

So far as the union is concerned the case appears to be one more instance of greed on the part of organized labor overreaching itself and pulling down upon its head its whole house, built up in Cleveland over a period of more than twenty years.

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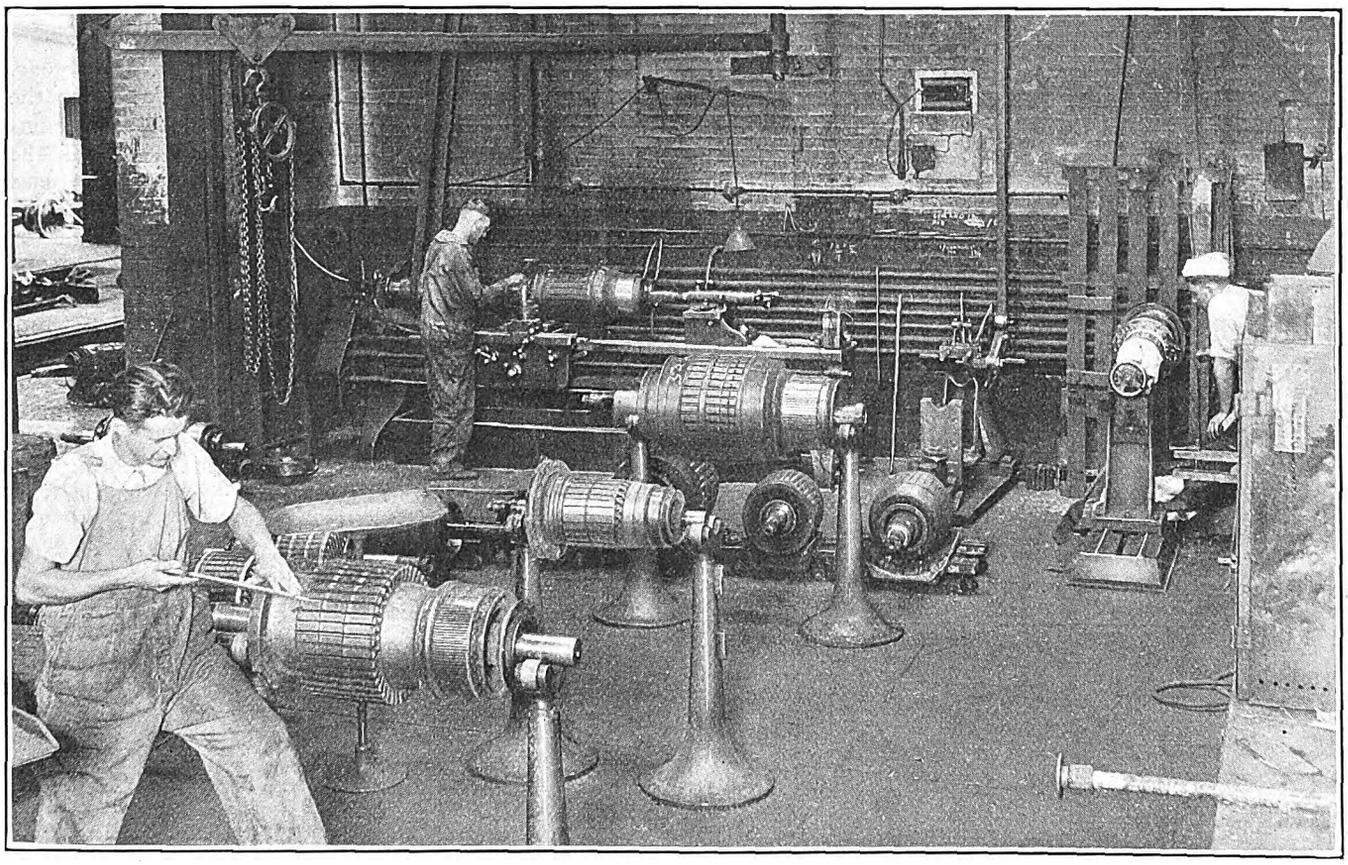
Reducing Motor Failures at Syracuse by Better Maintenance

By L. E. Worlock
Foreman of Armature and Controller Department, New York State Railways, Syracuse Lines

Program for Dipping and Baking Motor Armatures and Fields Started at the Wolf Street Shops of New York State Railways Two Years Ago Has Reduced Breakdowns Materially — Equipment and Methods for Doing Work Described



Repairing Armatures in the Wolf Street Shops of the Syracuse Lines, New York State Railways

SINCE the program of dipping and baking armatures and field coils was started at the Wolf Street shops of the New York State Railways, Syracuse Lines, a little more than two years ago, the methods used have proved effective in preventing insulation troubles caused by water and dirt. By applying a dipping and baking treatment to armatures that have been in service for a year renewed life is given to the insulation, cracks and pores are closed up and the coils are held tightly in the slots, preventing failures caused by vibration. This method has proved so successful that in two years only 0.5 per cent of the armatures and 0.67 per cent of the field coils so treated have failed in service.

Procedure in Repairing Armatures

When an armature is brought to the shop for overhauling the first step in the process of getting it ready for dipping and baking is to remove the canvas hood and the bands. Dry compressed air is then used to blow out the armature carefully so as to remove all carbon dust and dirt. Oil and grease are removed from the shaft and thrust collars by scrubbing their surfaces with gasoline.

The armature having received this treatment, core bands are again put on, care being taken that sufficient pressure is supplied by them to the coils. In some cases the coils have shrunk to such an extent that their top surfaces are below the level of the core bands. For armatures in this condition fillers consisting of narrow strips of canvas are placed in the slots on top of the coils. These give a surface for the bands to rest on and insure that the coils will be drawn permanently into position and held tightly.

After preparation for baking, the armature is placed in the oven, where it is heated to a temperature of from 200 to 210 deg. F. This baking is continued from three to six hours, which suffices to dry out all moisture, and it opens the pores of the insulation so that the insulating varnish will be able to penetrate readily.

The baking completed, the armature is removed from the oven and taken at once to the dipping tank, where

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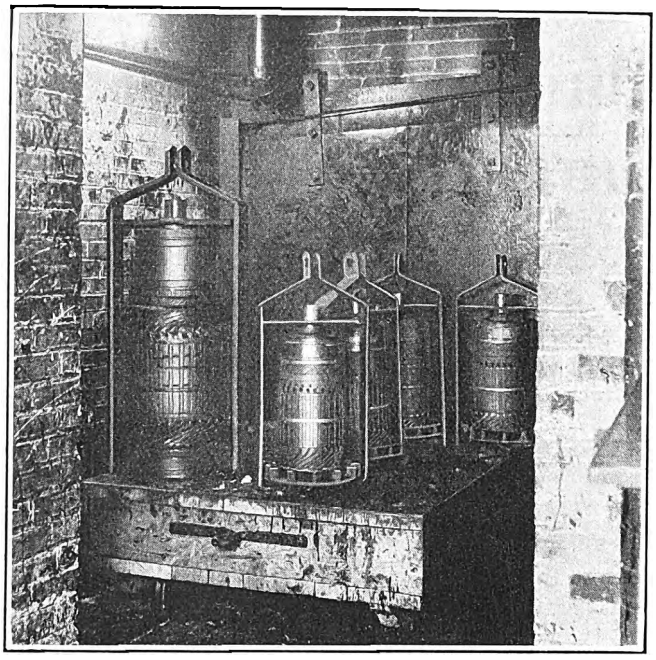


Armatures Are Placed on a Hand Truck and Run Directly into the Baking Oven

it is dipped while hot into the insulating varnish and allowed to remain for a period of from 20 to 30 minutes. Armatures are dipped with the shaft in a vertical position, pinion end downward. Dipping the armatures in the upright position has been found desirable in order to prevent the varnish from pocketing in the leads behind the commutator.

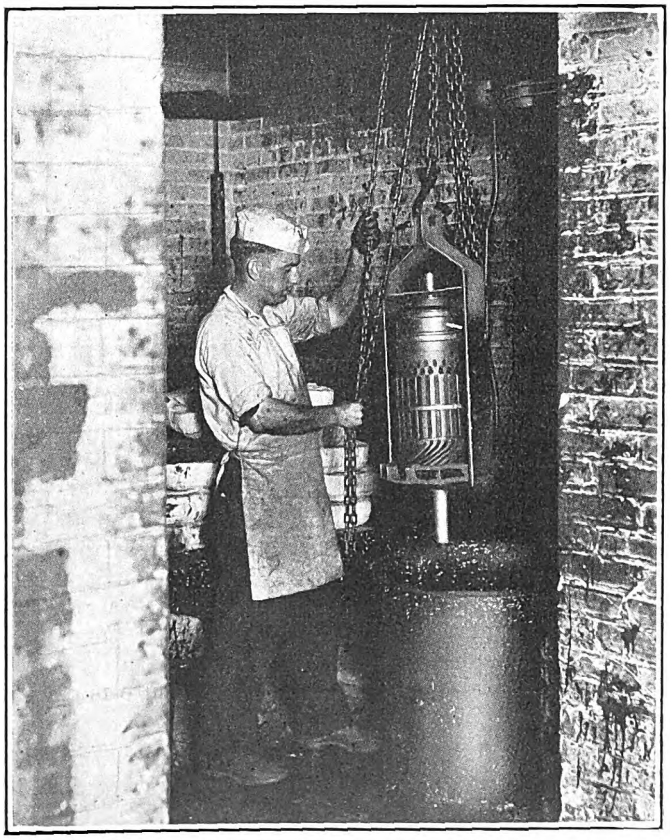
An effective means of transferring the armatures in this position by the overhead crane is made possible by the use of cradles. These have been made to fit each size of armature. They are made up of two flat steel bars, one going on either side of the armature. The lower ends terminate in hooks which reach under the end bells at the pinion end, while the upper ends are drilled to take the hook of the tackle. The upper end of the armature is held by a cross bar, which is bored in the center to pass over the shaft, and whose ends press against the side bars. Several of these cradles and the method of using them are illustrated in the pictures on this page.

Following the dipping, the armature is placed on a drain board and allowed to remain there until the surplus varnish stops dripping out. It is then placed in the oven and baked at a temperature of 200 to 210 deg. F. for a period of 36 to 72 hours, depending on the size.

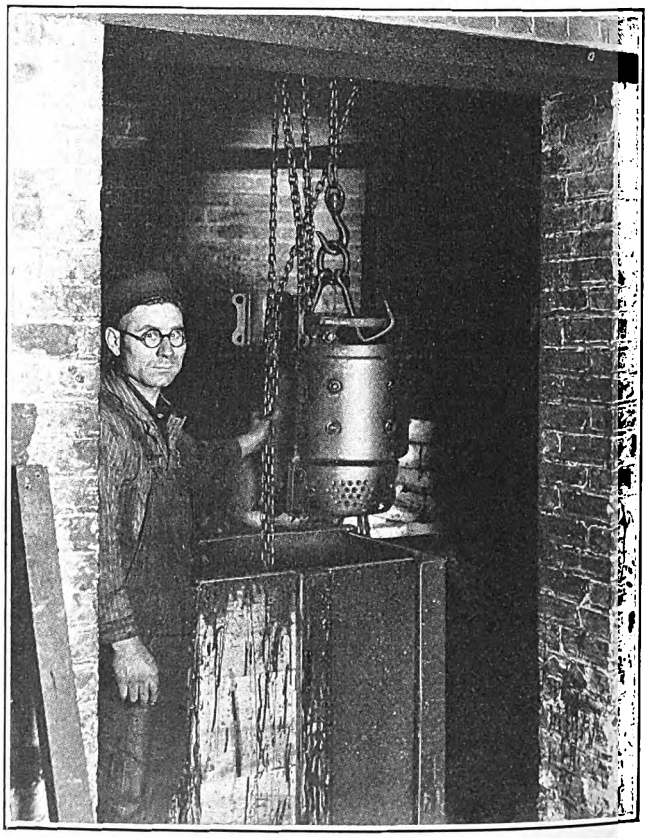
Oven and Dipping Tank in Separate Building

The building where the dipping and baking are carried out is located just outside of and adjoining the truck shop. It is built of bricks, with floor dimensions of 10 ft. x 18 ft. A wall in the middle divides the building into two sections. The rear portion is used for the baking oven. Heat is supplied by electric heaters. These are thermostatically controlled so that the temperature is kept accurately within the limits of 200 and 210 deg. F.

The front portion of the building contains the dipping tank. This is 24 in. x 48 in. and is sunk into the ground part way so that 24 in. projects above the floor level. The tank is connected by a 2-in. supply pipe with a 100-gal. supply reservoir, located in the rear outside of the building, which contains the baking varnish. Compressed air is used to force the baking varnish from the reservoir into the dipping tank. The varnish runs back into the reservoir by gravity when the air pressure is removed. Varnish to make up for



Dipping a Small Armature. Note the Cradle Which Is Used to Keep the Armature in a Vertical Position



Shells for Small Motors Are Dipped and Baked After the Field Coils Have Been Put in Place

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that used is placed in the dipping tank, from where it runs into the reservoir. Electric heaters placed in the housing of the supply reservoir keep the varnish at a temperature as nearly as possible the same as that which the armatures and field coils have attained after drying out. This gives better penetration of the varnish and speeds up the operation.

Armatures are brought to the dipping room on trucks. Then they are picked up by a chain hoist which is attached to a jib crane, by means of which they are handled into and out of the dipping tank. After the dipping and draining the armatures are placed in an upright position on a four-wheel truck, which runs on a track directly into the baking oven. The top of the truck has holes so spaced that the armatures can remain in an upright position during the baking. The truck is moved into and out of the oven by means of a handle which engages an eye on the front end of the truck. The truck with several armatures in position in their cradles is shown in the upper illustration on the preceding page.

Following the baking period the armatures are taken to the armature room and rebanded. Next they are tested for insulation strength at 1,000 volts a.c., and also are tested for short circuits. The canvas hoods are then placed in position and banded down.

Commutators are trued up on a lathe as the next operation. It is the practice to use only slotted commutators on the property, so that if needed the mica is undercut. The last operation in finishing the armature is to fit bearings individually to each shaft. They remain on the shafts until the machines are placed on the trucks, so that there will be no chance of misplacing them. A description of this method of fitting bearings and keeping them with the armatures was published in ELECTRIC RAILWAY JOURNAL for April 25, page 665.

FAILURES HAVE BEEN GREATLY REDUCED

During the two-year period that the dipping and baking of armatures has been caried out at the Wolf Street shops, as described, a total of 406 armatures have been given this treatment. Nearly 4,000 field coils for the larger motors and 1,200 fields for the Westinghouse 506-A motors have been dipped and baked. There have been but two breakdowns of armatures that have been treated, or 0.5 per cent. Field coil failures have averaged only 0.67 per cent following the reinsulating, dipping and baking.

Some trouble has been experienced with the smaller railway motors of the ventilated type due to the penetration of water inside the shell, causing grounds or short circuits. This is due in part to the design of the motor shell and also to the use of this type of machine on wheels of small diameter, so that the motors are considerably closer to the track than are the larger types. Thus they are subjected to considerably more splashing during the periods of the year when the tracks are covered with water and slush.

As a means of overcoming failures of this type and also as an added precaution in order to provide better insulation, the shells of motors of these small types are dipped in insulating varnish, after the fields have been assembled in place but before the armature has been put in. Following the dipping these shells are baked in the oven until the varnish is set thoroughly. This procedure fills in all small cracks in the fields and helps to hold them tightly in place on the pole pieces. It also provides a waterproof covering.

Wheel Service Compared

Mileage and Cost per Thousand Car-Miles Given for Three Properties Include Service Performance of Cast-Iron, Cast-Steel and Rolled-Steel Wheels

FIGURES obtained from service records of three important city properties on the performance records of various types of car wheels show some interesting comparisons as to mileage obtained and cost. The mileage for cast-iron, cast-steel and rolled-steel wheels in service on the lines of the Washington Railway & Electric Company, Washington, D. C., was published in ELECTRIC RAILWAY JOURNAL for Nov. 17, 1923, page 863, as a communication from R. D. Voshall, superintendent of equipment and buildings of that company.

TABLE I—WHEEL MILEAGES FOR YEAR 1923, WASHINGTON RAILWAY & ELECTRIC COMPANY

Type of Wheel	Average Miles	Cost per 1,000 Miles
20-in. cast iron	41,830	$0.132
22-in. cast iron	39,604	.171
30-in. cast iron	38,973	.238
33-in. cast iron	38,118	.289
30-in. cast steel	72,463	.446
33-in. cast steel	96,963	.345
31-in. rolled steel	99,400	.347

At that time figures for the first six months of 1923 only were available. These figures have now been completed for the entire year of 1923 and are given in Table I. Additional data for mileage and costs of wheels have been obtained from the Northern Texas Traction Company, Fort Worth, Tex., and the Key System Transit Company, Oakland, Cal.

An interesting point was brought out by Mr. Voshall in the previous article. This was that a large amount of the company's track is equipped with a rail having a very narrow groove, the clearance over the wheel flange being only $\frac{3}{8}$ in. This causes rapid wear on the back side of the flange and of course reduces the mileage obtained. The accompanying tabulation shows that while the average mileage for cast-iron wheels is considerably less than for cast-steel and rolled-steel wheels, still the cost per 1,000 miles is less than for the other types.

TABLE II—SERVICE OF CAR WHEELS DISCARDED FOR FOUR YEARS, 1920–1923, NORTHERN TEXAS TRACTION COMPANY

Type	Number of Wheels	Life in Miles—Total	Life in Miles—Average per Wheel	First Cost per 1,000 Car-Miles per Wheel, Cents
21-in. cast iron	290	13,708,390	47,270	13.7
22-in. cast steel	58	6,516,370	112,351	22.2
24-in. cast iron	194	6,634,002	34,196	20.35
24-in. cast steel	242	26,471,618	109,387	25.3
24-in. rolled steel	42	6,110,342	145,484	12.7
33-in. cast iron	404	12,436,932	30,784	37.1
34-in. cast steel	22	3,066,872	139,403	23.5
34-in. rolled steel	26	3,742,378	143,937	27.1
36-in. rolled steel	16	3,353,904	209,619	21.3
37-in. rolled steel	104	20,017,730	192,478	25.7

The Northern Texas Traction Company, Fort Worth, Tex., has had considerable experience with the three types of wheels and also has made some extensive tests. The company endeavored to find a wheel which would give a longer life between changes than cast-iron wheels. Beginning in 1918, some 200 pairs of 24-in. cast-steel wheels were installed.

These wheels were of a one-wear type. After the first wear various means of reclamation were tried in order to increase the mileage. An electric welder was used to build up holes in the tread, and the surplus

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metal was ground off. By this means it was found possible to get an additional 30,000 miles of service, but the reclamation expenses were rather high.

Rolled-steel wheels were also tried. These have made a better showing than the cast-steel wheels due to lower first cost, longer life and lower reclamation costs. These rolled-steel wheels are made to give more than one wear.

In Tables II to V information is given for the various types of wheels. Table II shows for the years 1920-1923 inclusive the number of wheels in service, the total life mileage, the average mileage per wheel, and the cost for 1,000 car-miles per wheel, taking the first cost only and not including costs for removal, replacement and re-turning. Table III gives a comparison of 24-in. rolled-steel and cast-steel wheels with cast-iron wheels of the same diameter for service and cost up to their first removal. Some of the causes for the first removal of wheels were worn or sharp flanges, defective and worn treads, and defects in the manufacture of the wheels. This comparison shows that neither rolled nor cast-steel wheels, when considered as a one-wear wheel like the cast-iron, reach the low cost per 1,000 car-miles that the cast-iron wheels do, although the rolled-steel wheels approach it very closely. J. T. Porter, master mechanic, who is following this investigation, states that so far no attempt has been made to standardize on any one type of wheel to the exclusion of others, but the tests are being continued as he believes that records of a few wheels over a short period of time are of little value.

A complete analysis of costs for 24-in. wheels is given in Table IV. This takes into consideration the additional mileage obtained from rolled-steel wheels after turning and includes figures for costs of removal, re-turning and replacement of all types of wheels, as given in Table V. This analysis shows that in order to get a mileage of 6,110,342, which was obtained from the 42 rolled-steel wheels tested, a total of 179 cast-iron or 56 cast-steel wheels would be needed. In obtaining this mileage it is necessary to change 68½ pairs of cast-iron wheels or seven pairs of cast-steel wheels, and in making this mileage 31½ pairs of rolled-steel wheels would be removed, turned and replaced.

The low first cost of the 24-in. rolled-steel wheels required to make the total mileage of 6,110,342 brings the cost per thousand car-miles with all factors taken into consideration down to 15.3 cents as compared with 25.6 cents for cast-iron and 26 cents for cast-steel wheels. The rolled-steel wheels used in this case are intended to give more than one wear, and by reclamation a total life of 145,484 miles per wheel has been obtained at Fort Worth.

In considering relative wheel mileages and costs for different systems, some information furnished by W. P. Jackson, master mechanic Key System Transit Company, Oakland, Cal., is of special interest.

In studying this information, shown in Table VI, consideration should be given to the following characteristics of the service in which the wheels operate. The 21-in. wheels are used in city trailer service, with an average light load per wheel of 3,500 lb. The 24-in. wheels are used in city motor service with an average light load per wheel of 4,700 lb. The 30-in. wheels are used in two types of service; 60 per cent of them are in city motor service with an average light load per wheel of 5,000 lb., and 40 per cent are in city trailer service, with an average light load per wheel of 4,000 lb.

There are two types of 33-in. wheels given. Those listed first in the tabulation are used in city motor service, with an average light load per wheel of 6,000 lb. The second lot of seventeen wheels given in the tabulation have M. C. B. treads and flanges. Of these, 75 per cent are in trailer flat cars, with an average light load per wheel of 4,000 lb., and 25 per cent are in city motor car service, with a light load per wheel of 5,000 lb.

The 34-in. wheels are all used in suburban service. Of these 50 per cent are trailer wheels with an average light load per wheel of 6,700 lb., and 50 per cent are motor-driven wheels, with an average light load of 8,000 lb. per wheel. The 36-in. wheels have M. C. B. tread and flange and are all in suburban service. Of these, 50 per cent are trailer wheels, with an average light load per wheel of 8,700 lb., and 50 per cent are motor-driven wheels with a light load per wheel of 10,500 lb.

TABLE III—COMPARISON OF 24-IN. ROLLED-STEEL AND CAST-STEEL CAR WHEELS WITH 24-IN. CAST-IRON WHEELS TO THE FIRST REMOVAL FOR WHEEL DEFECTS, NORTHERN TEXAS TRACTION COMPANY

Type	Number of Wheels	Life in Miles—Total	Life in Miles—Average per Wheel	Cost per 1,000 Car-Miles per Wheel to First Removal, Cents
24-in. cast iron	194	6,634,002	34,196	20.35
24-in. cast steel	264	21,171,784	80,196	34.6
24-in. rolled steel	70	5,370,962	76,728	24.1

TABLE IV—COMPARISON OF LIFE AND COSTS FOR 24-IN. WHEELS, NORTHERN TEXAS TRACTION COMPANY

Type	Cast Iron	Cast Steel	Rolled Steel
Total number of wheels tested	194	242	42
Total life mileage	6,634,002	26,471,618	6,110,342
Number of wheels necessary to make 6,110,342 miles	179	56	42
Pairs of wheels:			
Removed and replaced	68½	7	.....
Re-turned and replaced	.....	.....	31½
First cost of each wheel	$6.96	$27.77	$18.50
Total first cost	$1,245.84	$1,555.12	$777.00
Additional costs:			
Removal and replacement	321.95	32.90	.....
Re-turning and replacement	.....	.....	156.87
Total cost	$1,567.79	$1,588.02	$933.87
Cost per 1,000 car-miles, cents	25.6	26.0	15.3

TABLE V—LABOR COSTS FOR REMOVING AND REPLACING WHEELS AT FORT WORTH, TEX.

	Man-Hours	Rate	Total Cost
Removing and replacing wheels in car	2	$0.45	$0.90
	2	.35	.70
Removing and replacing ball bearing boxes on journals	2	.55	1.10
	2	.45	.90
Boring new wheels	1	.55	.55
Pressing wheels off and on	1	.55	.55
Total cost per pair of wheels			$4.70

By a like analysis of time necessary to reclaim a pair of 24-in. rolled steel wheels by turning to restore the flanges, the cost was found to be $4.98 per pair.

TABLE VI—MILEAGE AND COST PER THOUSAND WHEEL-MILES OF ALL WHEELS SCRAPPED DURING YEAR 1923 BY KEY SYSTEM TRANSIT COMPANY

Number of Wheels	Diam. Inches	Type	Mileage—Maximum	Mileage—Minimum	Mileage—Average	Mileage—Total	Original Cost—Gross	Original Cost—Less Scrap Credit	Net per Thousand Wheel-Miles	Weight, New	Lb. Scrap	Total Cost
138	21	Chilled iron	126,151	23,426	65,165	8,992,735	$7.76	$6.14	$0.094	240	216	$847.32
198	24	Chilled iron	131,291	27,760	60,386	11,956,470	10.04	7.94	.132	314	280	1,574.21
409	30	Chilled iron	250,661	31,360	90,478	37,005,687	12.20	9.27	.102	433	390	3,756.36
288	33	Chilled iron	167,458	27,900	82,028	23,623,958	15.23	11.55	.141	541	490	3,327.82
17	33	Chilled iron (M.C.B.)	164,510	72,370	114,590	1,948,030	20.29	15.74	.137	674	607	267.58
5	34	Cast steel	183,247	123,031	162,309	811,545	47.804	45.37	.2795	539	486	226.85
13	36	Cast steel	262,062	173,776	214,520	2,788,760	57.008	53.72	.2504	730	657	698.36

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Reboring 101-B Motor Frames for Oversize Housings

By E. F. Whitney
Renewal Parts Engineer Westinghouse Electric & Manufacturing Company

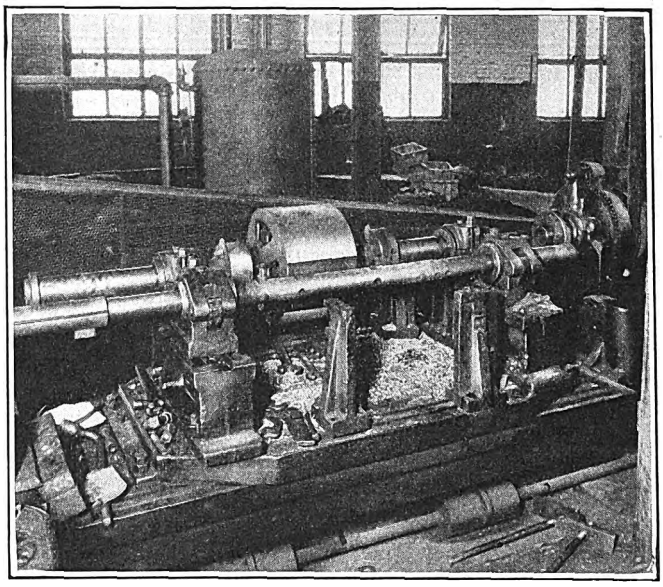
Split Type Motors to the Number of 1,200 Are Being Rebored by the Brooklyn-Manhattan Transit Corporation so as to Use New Through-Bolt Housings—Special Jigs and Fixtures Reduce Cost of the Reboring Operation

REBORING of Westinghouse 101-B split-type motor frames for new through-bolt housings and oversize axle bearings is now being carried out by the Brooklyn-Manhattan Transit Corporation according to a regular program. Approximately 1,200 of these motors, which have been in service for nearly twenty years, are to be rehabilitated.

The reboring is done on a two-spindle horizontal boring mill such as is used by the motor manufacturer in boring the frames. The wear which has occurred on these frames is chiefly around the housing fit at the axle bearing seat and split of the axle cap. The motors which are to be rebored are dismantled completely and the frames are sent to the welder. The gear case support arms which are cracked or broken off above the axle bearing are thermit welded and thereby reinforced. The inside and outside faces of the housing seat are welded to enable the housing seat to be machined to the original width. This seat, which usually is worn considerably, is not welded, since each frame is being rebored for ¼-in. diameter oversize housings. Were standard housings to be used the housing seat could be electric welded and then rebored to standard size.

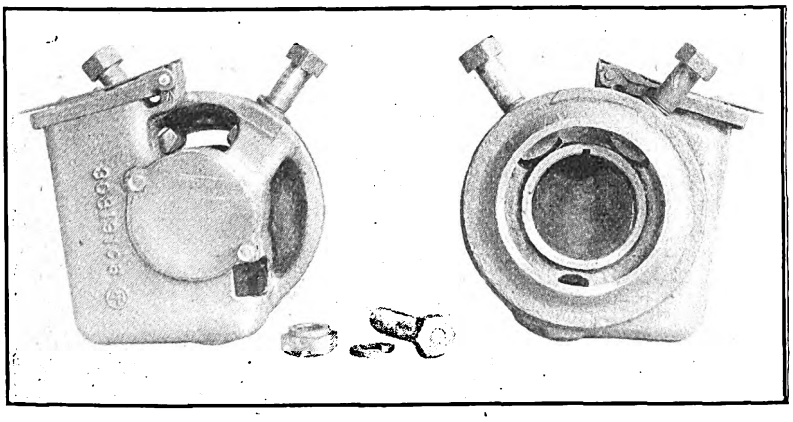
The axle-bearing seats are being rebored ⅛ in. larger in diameter than the original size. If standard axle bearings were to be used it would be necessary to weld the entire axle bearing seat in the frame before reboring. The bores of the axle caps are not welded, but a slight cut is being milled off the split so that the ⅛-in. oversize bore can be made. This procedure is particularly desirable if the axle caps are of malleable iron, as difficulty usually is experienced in machining this material after it has been welded.

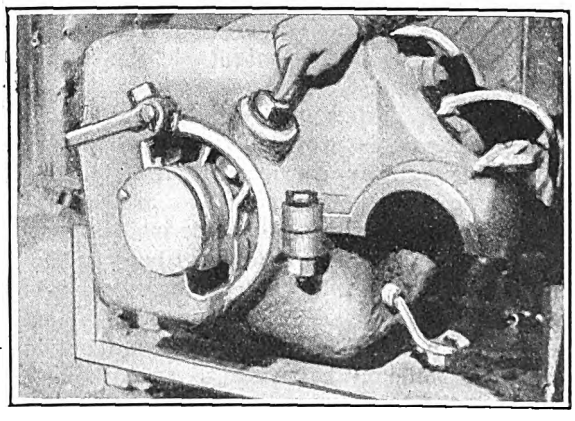
The time spent in welding and machining these frames is being held to a minimum. Slightly worn parts, such as gear case pads, bolt holes and the parting surface of each frame, are not being welded and machined. The outer face of each axle-bearing seat, which is the part of the frame and axle cap adjacent to the flange of the axle bearing, is merely faced off without attempting to keep the standard dimensions. This is satisfactory since the axle caps are not interchanged. In the latter event the faces would have to be welded and machined to standard dimensions.



The Motor to Be Rebored Is Assembled on a Drum Which Is Carried on a Boring Bar of a Two-Spindle Horizontal Boring Mill

The two halves of the frame are clamped to a drum which is shown in place on the horizontal boring mill





At Left, Type of Through-Bolt Housing Used with Revamped Split Frame Motor. At Right, Bosses Are Welded on the Motor Frames for the Through Bolts

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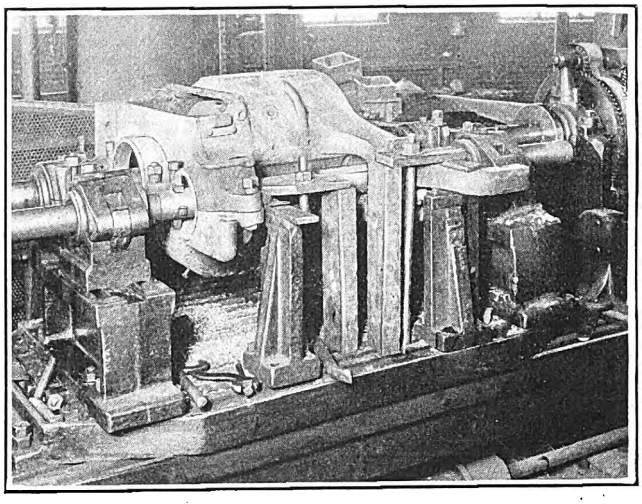


In This Illustration the Motor Frame Has Been Assembled on the Drum in the Boring Mill

in an accompanying illustration. The drum is fitted with bushings and mounted permanently on the boring bar. Running clearance between these bushings and the boring bar is not over 0.005 in., as it is desirable to make the bearing seat bore as accurate as possible and at the same time keep the air gap uniform. The four pads attached to the outside of the drum have been turned to the exact diameter of the pole seats. This drum is clamped between the four pole seats. Extra shims are used at the parting, near the frame bolts, to compensate for the wear of the split. With the shims in place and with the frame bolts drawn tight, the minimum clearance at various places around the frame parting is approximately 0.017 in. Without this clearance the frame will have little clamping action on the housing and difficulty will be experienced in keeping the housings tight.

The frame with the drum and boring bar is set in position in the boring mill. The boring bar toward the front of the picture is left in the boring mill and the axle caps are put on after the frame is set up. Sufficient clamping action of the axle cap is obtained without using shims when reboring the axle-bearing seats, but if the standard motor practice is to be followed shims with a total thickness of 0.017 in. should be used. The drum acts as a support and partially centers the frame in the boring mill. It is necessary to adjust the height of the axle side of the motor frame so that the center of the boring bar is $\frac{1}{8}$ in. above the axle cap parting. The two boring bars should be fitted in their bearings with little excess clearance and should be spaced the distance apart required for the type of motor being rebored. With the frame set up and the axle side clamped to the boring mill table the reboring can be done very quickly.

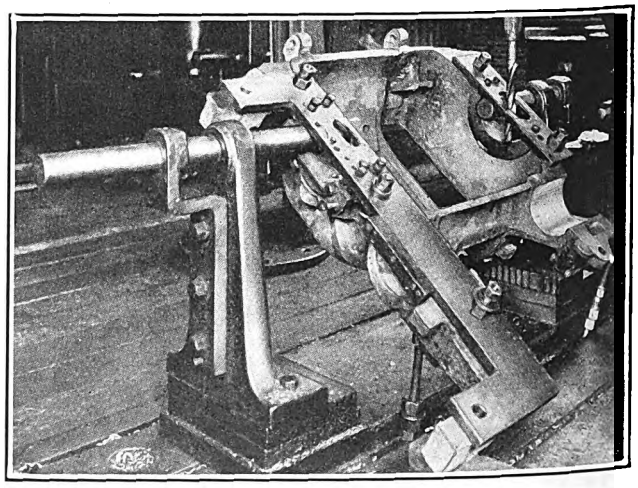
The main boring bar, which is used to rebore the housing seats, is provided with two tool heads. The other boring bar carries its own tools. A skilled mechanic, using both boring bars at the same time, can do very accurate work. Suitable inside micrometers are desirable for gaging the finished bores while the frame is in the boring mill. The housing seat bore should be from zero to 0.005 in. oversize and the axle cap seat bore within $\pm$0.002. The inside and outside housing seat faces should be made so as to give a tight fit between the two flanges of the housing. The over-all distance between the outside flange faces should be held within $\frac{1}{64}$ in., as this affects the end play of the armature. The axle-bearing seat faces are machined and gaged from the housing seat faces.

Adapting Motor Frames for Through-Bolt Housings

The 101-B type motors were originally equipped with cast-iron tap-bolt housings, each held to the upper frame by one vertical tap bolt. These have been a source of trouble with the cast-iron housings. The new housings are $\frac{1}{4}$ in. diameter oversize and are designed to use two radial through bolts and nuts in place of the tap bolts. The new housings are made commercially of either malleable iron or cast steel. They are interchangeable with the original tap-bolt housings.

In order to adopt the practice of using the two radial through bolts for the 101-B motors it is necessary to weld two bosses to each end of the upper frame. In the illustration showing a 101-B motor assembled with the through-bolt housing the shopman is pointing to one of the through bolts. Directly underneath the bolt head is one of the bosses welded to the end of the motor frame. The bosses are steel pieces shaped so as to fit the frame. Their diameter is about 3 in. It is preferable to weld the bosses in place before any reboring is done, since there may be some distortion of the frame while welding. Inspection holes in the frame back of these bosses are closed up by welding thin plates on the inside, so as to obtain clearance for the housing bolt head. Additional clearances, if desired, can be machined when drilling and spot facing the bosses. Each boss is spot faced after drilling to provide a seat for the housing bolt head. The jig consists of a semicircular ring about the width of the housing seat and of the same diameter less 0.005 in. The ring has a flange which is clamped against the inside housing seat face. The cross piece with the elongated hole, shown in an illustration, is bolted to the frame. The crosspiece for the pinion end may be extended and bushed for drilling the bolt holes in the two gear case support arms. Each jig has two hardened steel bushings in the half ring located radially on a 35 deg. angle so that the holes in the housing and frame bosses will line up when assembled. By supporting the frame on two pedestals, as shown, it is possible to tip and block the frame at the desired angle so that the drill will enter the bushing without binding.

With the set up as described for reboring, it is not necessary to mill off the parting surface of each frame, even though it may have become somewhat worn, or to rebore the pole seats. This eliminates any necessity



Holes for the Housing Bolts and Gear Case Are Drilled with the Aid of These Jigs

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for making a change in the brush-holder pads. When the frames are assembled each housing should fit tightly in the frame. High grade bolts should be used to clamp the axle caps and frame together. These bolts should be drawn up tightly and evenly so as to give the desired clearance between frame halves and to avoid any distortion of the frame which would cause misalignment of the armature bearings.

The time required to do the necessary welding, reboring and other work on axle caps is equivalent to approximately one day. The work is comparatively simple and inexpensive if the necessary jigs and shop facilities are available. The expenditure for rebuilding these motors and putting them in good operating condition will undoubtedly be repaid many times by lower maintenance and better service. When remachined and fitted with new housings, bearings and other parts these motors are practically equal to new ones and should give satisfactory service for several more years with decreased maintenance costs.

Systematic Records Reduce Line Failures

Every Failure of the Overhead on the Toronto Lines Is Recorded—A Study of These Records of Troubles and Locations Where Trouble Occurs Are Followed Up with Inspection and Replacements — Delays to Traffic Have Been Reduced Materially as Defective Parts Are Not Allowed to Remain in Service

By J. F. Neild

Electrical Engineer Toronto Transportation Commission, Toronto, Canada

MATERIAL reduction in failures of the overhead structure has followed the inauguration of a plan for keeping systematic records of failures. This work was started following the reorganization of the operating forces when the street railway system of Toronto was taken over by the Toronto Transportation Commission in September, 1921. This entire plan has been developed on the assumption that the trolley wire, together with its possible effect on power supply, can cause more interruptions to traffic than any other single cause except a total power interruption.

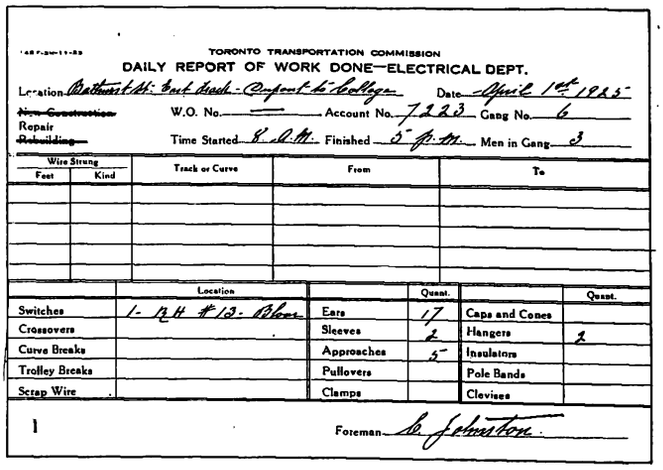
The Toronto street railway system has some 225 miles of No. 00 trolley wire, of which 157 miles is alloy and 68 miles hard-drawn copper. The suspension is $\frac{5}{16}$-in. seven-strand galvanized wire with lock hangers and 15-in. ears. There are feed taps or equalizers every 500 ft. All spans on iron poles have triple insulation, while those on wooden poles have double insulation. Porcelain insulators are used on all new construction.

The city is divided into sections on the basis of car mileage rather than wire mileage, but as all parts of the system have from four to five minute headway with a 200 per cent increase on the morning and afternoon peaks, the whole city has to be treated as a heavy traffic proposition. Each section is in charge of a foreman, who has one inspection truck with a three-stage power hoisting tower and swing table. This is manned by two first-class linemen and a chauffeur. This foreman is in charge of all the construction and maintenance work in his section. Of course the gangs are pooled when necessary to handle any large job. This gives a very flexible organization of small size which is always occupied.

As the inspection proceeds all necessary repairs are made and the wire is realigned. Approximately every three months the entire system is gone over completely. Except for natural depreciation its condition is kept practically as good as new. Long stretches of worn trolley wire which require renewing are listed, a schedule of renewals made out and the wire renewed during the cold weather. In this way the trolley wire is strung at maximum tension with minimum sag and the temperature strains take care of themselves. As the normal variation of the temperature of the wire ranges about 120 deg. F. in Toronto, these frost strains must be given consideration.

Accurate Records Are Kept

Each day a memorandum of the day's work is made out. This gives the charge number and form (Fig. 1) for each job of the previous day's work. The memo-



TORONTO TRANSPORTATION COMMISSION

DAILY REPORT OF WORK DONE—ELECTRICAL DEPT.

Location Bathurst St. East track - Dupont to College Date April 1st 1925

~~New Construction~~ W.O. No. — Account No. 7223 Gang No. 6

Repair ~~Rebuilding~~ Time Started 8 A.M. Finished 5 P.M. Men in Gang 3

Wire Strung Feet	Wire Strung Kind	Track or Curve	From	To

	Location		Quant.		Quant.
Switches	1- 12H #13- Bloor	Ears	17	Caps and Cones	
Crossovers		Sleeves	2	Hangers	2
Curve Breaks		Approaches	5	Insulators	
Trolley Breaks		Pullovers		Pole Bands	
Scrap Wire		Clamps		Clevises	

1 Foreman C. Johnston

Fig. 1—The Work Done Each Day Is Reported on This Form

randa are sent to the chief clerk, who checks the charges for correctness, sending them on to the cost clerk. The latter keeps a running check of the cost against the current budget. The forms finally go to the record clerk for his information. If he thinks the work important enough, he has it checked up by a junior engineer.

Every frog, crossover, and curve replacement is recorded as shown by Fig. 2, and every piece of wire, even down to a length of 2 ft., is recorded as shown by Fig. 3. This gives an accurate knowledge of the wear and tear of every part of the system. Incorrectly located frogs show up very quickly; curves which are not properly offset are known in a very short time and are corrected.

In order to facilitate records and to insure that re-

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At	Part	New	Ren.	Ren.	Ren.
3	L.H. switch	11-24-24			
4	R.H. "	11-24-24			
5	L.H. "	10-13-22			
6	R.H. "	9-15-22			
7	L.H. "	9-15-22	2-7-24		
8	R.H. "	9-28-22	9-21-23	2-1-24	1-6-25
9	R.H. "	11-24-24			
10	L.H. "	10-13-22			
12	L.H. "	9-15-22	1-31-24		
13	R.H. "	11-24-24			
14	L.H. "	10-11-24			
15	R.H. "	10-11-24			
19	Crossover	11-24-24			
20	"	9-28-22			
23	"	11-24-24			
24	"	11-24-24			
25	"	9-15-22	6-19-24		
26	"	10-11-24			
27	"	10-11-24			
28	"	9-28-22	6-19-24		
29	"	10-11-24			
30	"	10-11-24			
31	"	10-11-24			
32	"	10-11-24			
		New	Mat.	Ren.	Mat.
CD	Curve Wire	11-24-24	112' Br.		
EF	" "	10-13-22	98' Cd.		
GH	" "	9-15-22	102' Cd.		
LM	" "	11-24-24	95' Br.		
NO	" "	9-15-22	86' Cd.		
PQ	" "	9-28-22	89' Cd.		

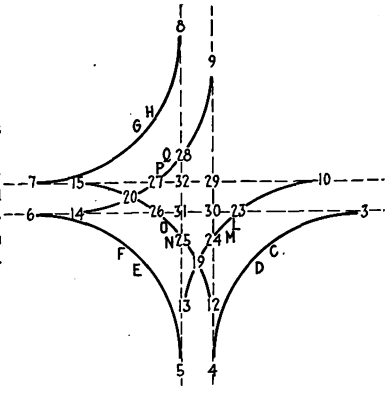
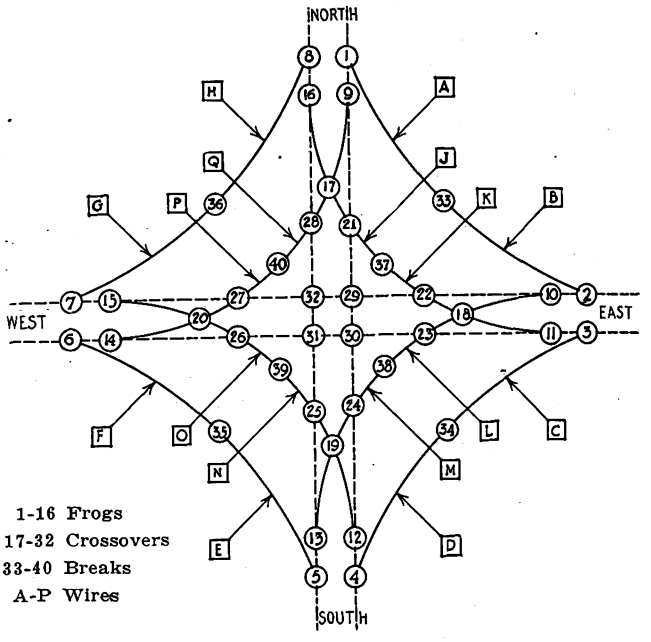


Fig. 2—Every Replacement Is Recorded, as Shown in This Record of Replacements at St. Clair and Yonge Streets. The Original Form Contains Eleven Columns for Renewals



Report all overhead work as follows, giving date, location, material and quantity:
Bathurst & Dupont—Curve—A. B., New Wire
80 Ft. Cadmium—No. 2 R. H. Switch
Bloor—North Track—From No. 2 Switch at Avenue Rd. to Third Pole West of Yonge Street 1,500 Feet H. D. Copper.

Fig. 4—A System of Numbering and Lettering Parts at Intersections Simplifies Record Keeping

ports from the traffic department shall be accurate, we have developed a system of lettering and numbering the various parts of an intersection, as shown in Fig. 4. Every traffic inspector has a copy of this chart. Excellent results are obtained because the actual frog or crossover which is giving the trouble is definitely indicated in the report.

ORGANIZATION OF OVERHEAD DEPARTMENT

In Toronto the relative number of overhead emergency calls per month is considered as a barometer. The variation shows quite clearly the condition of the wires. While it is necessary to watch construction and maintenance work closely, the electrical engineer finds it desirable to study the emergency trouble reports with the greatest care, in the interest of traffic.

The Toronto Transportation Commission has one emergency department to which are sent emergency calls of all kinds. These calls are received by a clerk who is responsible for dispatching the proper gang (way, rolling stock or overhead) to take care of the trouble. The overhead emergency department has a standard truck and crew, the same as a maintenance gang. When they are sent out they are expected to make permanent repairs in every case where it is possible to do so in a reasonable time.

Every telephone message of any kind sent into the emergency depot is logged and kept for reference. In

Location.....ST. CLAIR Ave.

Lengths of 100 Ft. and Over							Short Lengths				
Date	Class	From	To	Wire	Kind	Feet	Date	Location	Wire	Kind	Ft.
21, Dec. 23	New	Caledonia.....	60' E No. 43.....	N	HD	220	22, June 16	1 PW Vaughan.....	S	2nd	5
22, Sept. 15	"	No. 7 at Yonge.....	West to Tr. Br.....	N	Cd	300	June 16	1 PW Vaughan.....	N	2nd	5
Sept. 15	Ren.	21'W No.10 at Vaughan	1 PE No. 10 at Vaughan	N	Cd	105	23, Sept. 27	1 PW Vaughan.....	S	2nd	42
23, Apr. 2	"	1 PW Parkwood.....	1 PE Poplar Plains.....	N	Cd	1,572	Oct. 10	No. 43 at Caledonia	S	Cd	45
Sept. 1	"	2 PW Avenue Rd.....	16' E No. 6 at Ave. Rd..	S	Cd	357	24, Feb. 28	No. 23 at Wychwood	S	2nd	54
Oct. 16	"	30'EIPE Caledonia....	West to Caledonia.....	N	Cd	105	Feb. 28	No. 3 at Bathurst...	S	2nd	45
Oct. 16	"	2PW Wychwood.....	3 PE Wychwood.....	N	Cd	365	Oct. 11	1 PW Yonge.....	N	HD	20
24, Feb. 19	"	1 PW Bathurst.....	East to Bathurst.....	N	2nd	120	Nov. 18	1 PW Mt. Pleasant	N	HD	97
Feo. 26	"	1 PE McRoberts.....	2 PE McRoberts.....	N	2nd	120	Dec. 12	40' E Caledonia....	N	Ph	75
May 19	"	1 PE Greensides.....	1 PW Parkwood.....	N	HD	5,477					
May 20	"	1 PE Greensides.....	2 PE St. Clarens.....	N	HD	5,313					
May 21	"	25' EIPE Caledonia....	2 PE St. Clarens.....	N	HD	1,501					
May 21	"	50' EIPW Caledonia...	1 PE Westmount.....	N	HD	3,521					
May 22	"	2 PW Wychwood.....	1 PE Westmount.....	S	HD	4,810					
May 23	"	2 PW Wychwood.....	1 PW Poplar Plains....	S	HD	5,417					
June 5	"	1 PE Poplar Plains....	10' E No.15 at Ave. Rd.	N	HD	596					
June 5	"	1 PW Poplar Plains....	1 PE Forrest Hill.....	S	HD	362					
Oct. 11	New	1 PW Yonge.....	2 PW Avoca Bridge....	N	HD	1,078					
Oct. 11	"	1 PW Yonge.....	2 PW Avoca Bridge....	S	HD	1,078					
Oct. 29	"	2 PW Avoca Bridge....	2 PE Avoca Bridge....	N	HD	1,021					
Oct. 29	"	2 PW Avoca Bridge....	2 PE Avoca Bridge....	S	HD	1,021					
Nov. 1	"	2 PE Avoca Bridge....	Mt. Pleasant Loop.....	N	HD	862					
Nov. 1	"	2 PE Avoca Bridge....	Opp. Mt Pleasant.....	S	HD	862					
Nov. 7	"	Opp. Mt. Pleasant.....	East end of Loop.....	S	Br.	67					
Nov. 18	Ren.	2 PE Avoca Bridge....	5 PW Avoca Bridge....	S	HD	1,372					

Fig. 3—Wire Replacements Are Recorded to Show Length, Location and Date. This Is the Record for a Portion of the Line on St. Clair Avenue

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Form 1415 4m-8-23

EMERGENCY TROUBLE REPORT Nº 3551

ELECTRICAL DEPT.

TORONTO TRANSPORTATION COMMISSION

	Reported	Received	Issued	Man Arrived	Cleared	Man Returned
How	11					
Time	7.30 A.M.	Time 7.30 A.M.	Time 7.35 A.M.	Time 7.43 A.M.	Time 7.52 A.M.	
By	Jno. Simmonds	By W. White	To W. Davis	Delay	By W. Davis	

Delay (if any) in Reaching Trouble Caused by .....

Location of Trouble Harbord (between Montrose & Grace)

Trouble Reported Broken Insulator

Trouble Found 5 Hangers stripped out of ear - Put on new Hangers

5

Repair Permanent or Temporary ..... Signed W. Davis

Fig. 5—Emergency Troubles Are Logged and Kept for Reference on a Standard Form

case the call has reference to trouble on the overhead lines the record is made on the form shown in Fig. 5. This form is known as the emergency trouble report (E. T. R.). When it is filled in, it tells the whole story of the emergency call. Complete records for the day are sent to the head office by 9 o'clock the next morning. Then they are tabulated and sent out to the various departments interested, so that by 10 a.m. the part played by the overhead department in the previous day's traffic delays is known.

All these overhead emergency calls are spotted on a map which is inspected regularly by the superintendent of the department. If any location has more than two calls per month a special inspection is made so as to forestall the development of any serious trouble. Each month a new map is started and the previous month's calls are tabulated under 21 headings in a report showing the calls for the corresponding month of the previous year and cumulating both years up to the month of the record. This gives a definite comparison of the general condition of the overhead system.

When a trolley wire is broken a report is made on the form recommended by the American Electric Railway Engineering Association on page 692 of the 1924 proceedings.

Each break is investigated by an engineer. If at all possible, a definite cause is determined and the condition corrected. If the break shows any peculiar fracture a photograph enlarged to 20 diameters is made and studied. An analysis of these breaks made at the end of the year is interesting and instructive. It is an excellent guide in planning future work, as it indicates in what direction action must be taken to improve conditions.

Charting the record in the form of a running curve, as shown in Fig. 6, indicates clearly that these methods have materially reduced the potential delays to traffic that are due to the overhead lines. Our experience shows that in order to obtain such a reduction we must have an accurate knowledge of what is happening, and immediately take steps to remedy any condition found to be faulty.

All costs are checked. They are held to an authorized budget set out for the year by months. The items are divided into labor and material estimates for each account number, so that the cost of any change that is made to improve the efficiency of the system is definitely known. Of course its value can be judged accordingly. The time and money spent are considered well worth while. The procedure followed has given us a freedom from annoying traffic delays which are the bane of every traffic official's existence.

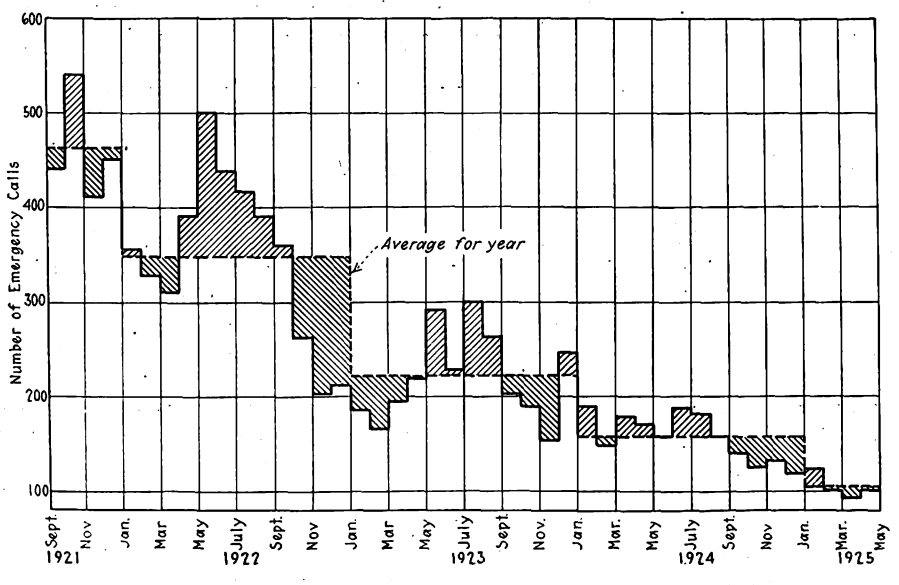

Fig. 6—Emergency Calls per Month from September, 1921, to May, 1925, Inclusive

Reducing Noise in Car Operation

Much Can Be Accomplished by Proper Design—Wear of Parts and the Sound Emitted Vary Approximately as the Square of the Clearance—Higher Standards for Fitting Parts Are Desirable to Lessen Noise

By H. S. Williams
Assistant Superintendent of Equipment, Department of Street Railways, Detroit, Mich.

MUCH of the objectionable noise produced in the operation of electric railway cars is shown by analysis of causes to be due to hammer-like blows originating between the rail and wheel. These blows may be small while the car is rolling over smooth rail or they may be heavy as when passing over special work. Whether light or heavy, they set up vibrations in the wheels which are transmitted through every portion of the car. If all parts of the car were rigidly fastened together, then the only noise possible from blows of this sort would be due to vibrations within the structure. Such a noise would be similar to the sound produced when any solid object is struck a heavy blow. The parts of a car are not solidly united, but are broken up by various bearings, springs, supports, etc. Hence the vibrations set up through the wheels tend to produce rapid motion between separated parts, causing them to strike together and produce noise. There is then a primary cause for noise due to wheel and rail contact and a secondary rattle or vibration set up by parts striking together but due to the primary cause.

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It can be stated positively that noise in cars is a composite. No single remedy is applicable; rather, the solution of the problem lies in the adoption of many forms of relief, the summation of which will result in quiet operation.

Considering the first-mentioned source of noise, the possibility of reducing it lies in cushioning of parts and reduction of unsprung weight to the minimum. Cushioning is applicable and necessary to the track structure as well as to the car. It may take one of many available forms. Cushioning for cars may be obtained by the use of some form of cushion or resilient wheel, means for deadening the ringing sound of wheels such as bolted-on wood or composition blocks, means for breaking up the continuity of metal such as the interposition of pads of canvas, rubber, asbestos, or other similar material. These will tend to absorb vibration and prevent its transmission from one steel member to another. The use of a cushioning flexible surface such as headlining or steel sides may also be needed to kill the sounding board effect.

Reducing unsprung weight will reduce noise. Less sound will be generated, as the blow struck between wheel and rail will be lighter. Incidentally, reduction of unsprung weight will improve riding qualities. As a matter of fact, if the cushion wheel proves practical it will solve the problem of cushioning, as far as the car wheel is concerned, and also the problem of unsprung weight, for this type of wheel would have the effect of carrying on springs all weight except that of the wheel rims. While discussing weight, it must not be overlooked that the total weight has an important bearing. It is perfectly obvious that the lighter the car the less will be its noise in rolling over the rail.

Careful Fitting Will Reduce Noise

Coming, then, to the second classification of noise, or that due to the striking together of car parts that are not rigidly joined, it is believed that one broad rule applies and that its adoption will result in the minimum of sound from this source. This rule is to adopt much higher standards of construction and maintenance for all fitted parts. It is readily apparent that if two parts are loosely fitted there will be greater rattle than if they are held tightly together. For instance, a loose journal box cover is productive of much noise. If the cover were bolted tightly there would be none. Likewise, it is admittedly true that a loosely fitted bearing is noisy, while if bored to a snug fit it will be quiet. Moreover, the more clearance there is the greater will be the volume of the noise. Equipment men are beginning to realize that in the past they have been too tolerant in their practice of fitting bearings and similar parts. In nearly any railway shop clearances of $\frac{1}{16}$ in. have been considered allowable and in many instances $\frac{1}{8}$ in. clearances have passed inspection. Compare this with automobile practice, where clearances are held rigidly to a very few thousandths, and an idea may be obtained of how crude car maintenance practices have been.

There are two very strong reasons why higher standards of bearing fittings should be favored, first on account of noise and second on account of wear. The noise has already been discussed. As to wear, there are two forms involved, that due to friction and that due to hammering. The friction remains practically constant throughout the life of the bearing, if it be protected from dust and dirt. But if, as in the case of axle bearings on older types of motors, an end of the bearing be exposed there will be a lapping or grinding action proportional to the area of the opening or clearance. Assuming the bearing to be a true circle, if there be clearance beyond that required for the oil film, then the area of this clearance will vary almost directly as the clearance, and the grinding action will approximate this same ratio.

The wear due to hammer blows will vary almost directly as the square of the clearance. It is believed by the writer that this element of wear is of greater consequence than frictional wear. As an illustration to this refer to the first figure. This represents an exaggerated case of an axle (A) and its surrounding bearing surface (B), the clearance being shown as (D). Due to vibration, the bearing will move in a vertical direction to the limit of the clearance and will strike at (E) a blow whose value is not easily calculable. But the energy of the return blow will vary as the square of the space traveled, or, in other words, the clearance.

Since the volume of the sound is directly proportional to the energy of the blow it follows that the noise is also directly proportional to the square of the clearance. Consequently if it is desired to reduce sound to the minimum greater care must be exercised to insure accurate bearing seats. Equal care must be used in fitting bearings to them, using as low clearance as possible. In so doing noise and wear will be reduced to the minimum.

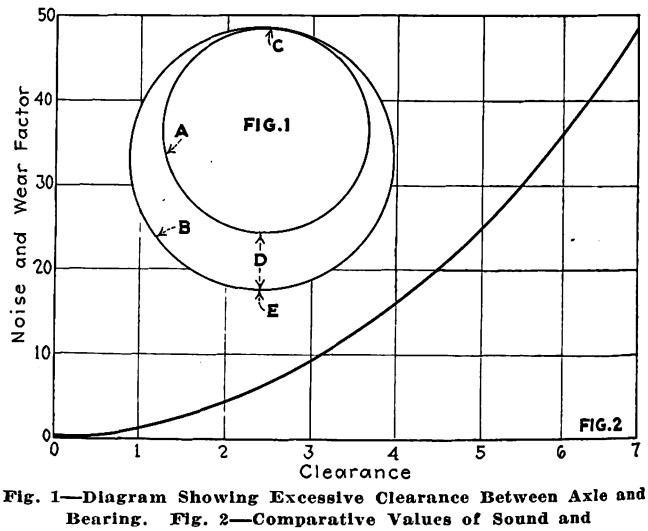

Fig. 1—Diagram Showing Excessive Clearance Between Axle and Bearing. Fig. 2—Comparative Values of Sound and Wear for Varying Clearances in a Bearing

By adopting higher standards of maintenance, which means renewals at lower limits of wear than is the present practice, the condition of quiet economical operation once incorporated in the design will be perpetuated. The economic value of this can be shown more clearly, perhaps, by the graphic method. Since wear and sound vary approximately as the square of the clearance, the relation between wear and clearance may be seen from the accompanying graph. Arbitrary values are assigned in this graph to clearance and noise, but it shows how slowly the noise factor increases during the early stages of wear and how it accelerates as wear progresses. Unfortunately tests are not available which would make it possible to assign actual values. Data are in the course of preparation and will be available at a later date.

While the above argument has been developed with particular reference to bearings, the same line of reasoning is applicable to other fitted parts.

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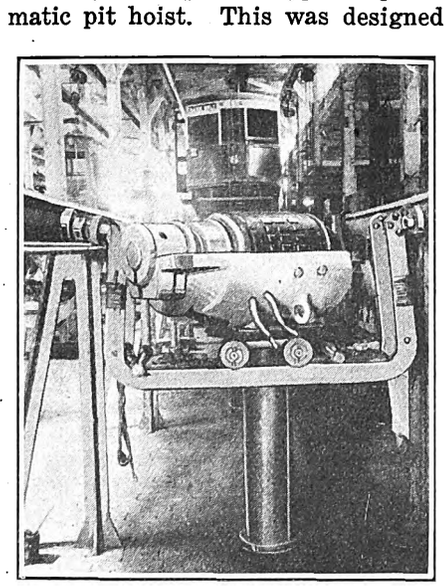
Equipment Maintenance Notes

Suspended Pit Hoist for Handling Motors

REMOVAL and replacement of the lower shells and armatures of split frame motors has been facilitated by a suspended type of pneumatic pit hoist. This was designed



This Movable Pneumatic Pit Hoist in the Houston Shops Is Carried in a Cradle Which Rides Along the Base of the Rail on Roller Bearings.

and built in the shops of the Houston Electric Company under direction of F. J. Bennett, master mechanic. The hoist also has proved useful for handling box frame motors of the smaller sizes.

As shown in the accompanying illustration, this hoist consists of an 8-in. air cylinder with approximately a 30-in. stroke. This is carried at the bottom of a movable cradle which rides along the inside flange of the rail base on rollers which are fitted with roller bearings. The cylinder is mounted on a small cross-carriage which rides on grooved wheels supported on the crossbars of the cradle. Thus the entire hoist may be pushed along the pit by hand to any desired position. At the same time the cross carriage may be moved so as to bring the motor up to the proper place. Mounted in the top end of the piston is a small table approximately 16 in. x 11 in., which may be rotated on its supporting center bearing in the piston. Consequently, a motor may be freely rotated into any desired position while being hoisted into place.

The supporting cradle is made of two ¾-in. forged bars, formed to the proper shape and bolted to the roller brackets at the ends. The cylinder is supplied through a hose with shop air at a pressure of from 90 to 120 lb. A control valve is mounted on one side of the suspension carriage.

It will be noted from the illustration that the tracks in the Houston shop are elevated above the shop floor level on cast supporting struts. With this type of construction this form of pneumatic hoist is particularly useful for handling motors. The same idea, however, is also applicable to the usual forms of pit. Motors may readily be run out from under a car on the hoist and moved to any desired point in the shop by lifting them from the cradle with overhead cranes. It may be noted that the small rotating table allows the motor to be held in exactly the proper position for mounting on the axle of a car or truck, as soon as it had been raised high enough to clear the vertical legs of the cradle and the track.

Motor Maintenance on the I. T. S.

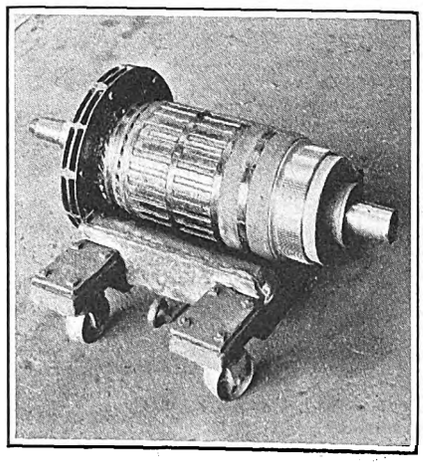
MOTOR cars which come into the Decatur shops of the Illinois Traction System for overhauling are returned to service the same day. This is made possible by having a supply of spare motor frames which can be used in case repairs require excessive time. When the truck is run out from underneath the car the motor is lifted out by the shop crane and is delivered to the motor repair department, where it is stripped of armature and field coils. The work of overhauling includes blowing off all dirt by compressed air and making repairs where necessary. In case the nose suspensions are worn they are built up by the electric welder. Worn bolts are replaced and covers are fitted carefully.

Field coils are removed and sent to the armature department for testing. If they are in good condition, they are returned and put back into the same motor. The inside of the frame is given a coat of black insulating paint. The frame heads are cleaned of all grease and dust by scraping and washing in gasoline. Oil wells are also cleaned. Brush-holders are inspected carefully, and repaired by installing new springs and other parts which are worn. Armature bearings are gaged and if worn excessively are replaced with newly babbitted bearings.

When the repairs and reassembling are completed, the field coils are given a 1,600-volt test to ground and the poles are tested for polarity to make certain that field connections have been made properly. Armatures are tested after installation for clearance from the pole faces, and the clearance of brush-holders from the commutator is gaged.

Handy Armature Buggy

FOR moving armatures about the shop and keeping them off the floor so as to prevent damage, a large number of small armature buggies



Armature Carriage Used in the Syracuse Shops of the New York State Railways

are used in the Wolf Street shop of the New York State Railways, Syracuse lines. These are made with a wooden framework, which supports a cradle which is padded with canvas

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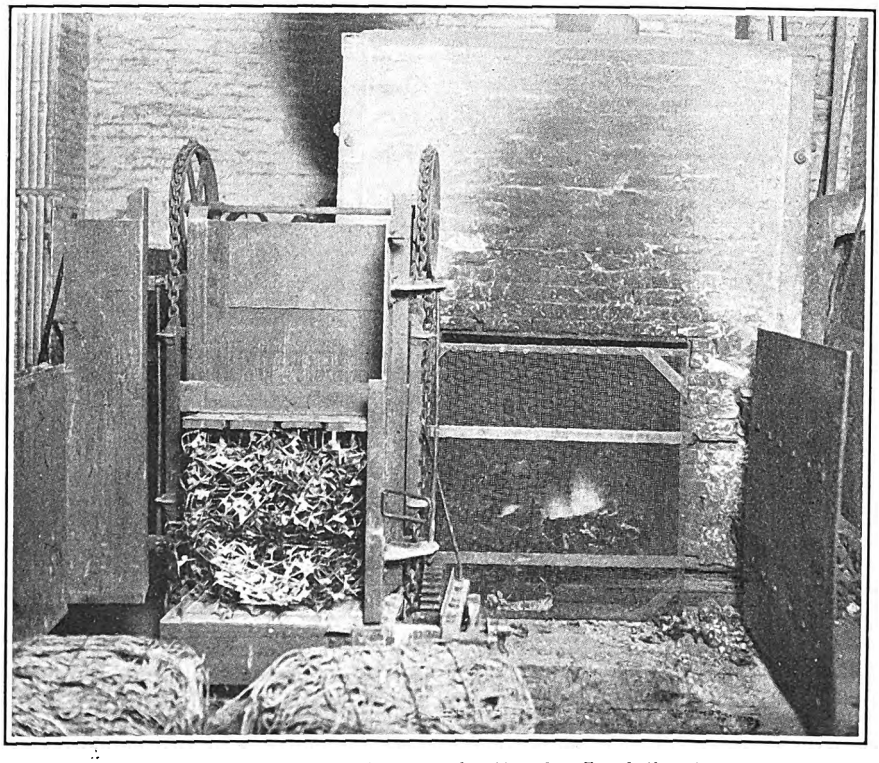
to prevent injury to the armatures when they are placed in position. Four casters are bolted to steel plates above the frame. A forged-steel eye on either side of the cradle is arranged so that a handle can be hooked in for moving the carriage.

Baling Copper Scrap Makes Sale Easier

REMOVAL of the insulation from copper windings and baling of all the scrap copper has facilitated handling and resulted in more ready sales at increased prices by the Third Avenue Railway, New York, N. Y. Several large wooden bins are provided in the section of the shop where the insulation removal and baling take place. Scrap windings and other scrap copper as they come from the department of electrical repairs and also from the various maintenance shops are placed in these bins until there is a sufficient quantity for several bales.

All insulation is removed by burning. A brick furnace approximately 8 ft. square by 10 ft. high has been installed in one corner of the section devoted to this work. A flue leads to the chimney and there is an opening in the front 3 ft. square for throwing in the material. In order to make certain that other refuse and waste materials are not thrown into the furnace while insulation is being burned from copper windings, a screen is provided to protect the opening. Whenever burning is taking place without an attendant this is locked shut. A sheet steel door to provide for closing the opening to the furnace entirely is also provided.

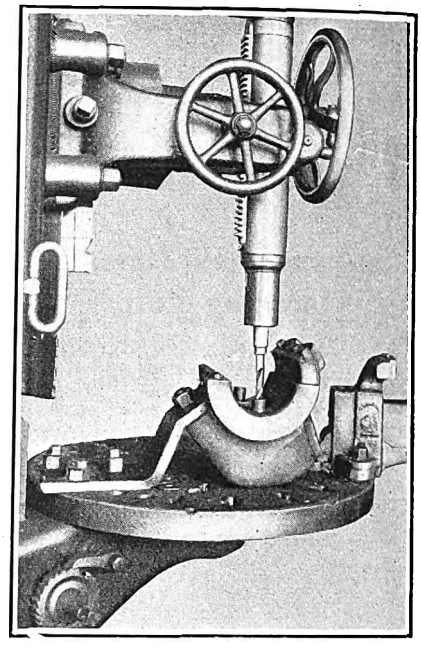
After the insulation has been removed all scrap copper is baled in a press made by the Economy Baler Company, Ann Arbor, Mich. This press produces cubical bales approximately 30 in. on a side and weighing 300 lb. The copper scrap is placed in the baler with the movable pressure platform in the raised position. When filled, pressure is applied to lower the platform and compress the scrap by a combination gear and chain drive. Removal of the scrap from the bins and placing and burning it in the furnace are done by a man with other duties on regular day work. The baling, however, is done on a piecework basis, at the rate of 50 cents per bale.



Baling Press with Front Open. The Furnace for Burning Insulation from Copper Is in the Background. Two Bales of Scrap Copper Ready for Removal Are in the Foreground

Drilling Dowel Holes in Axle Caps

ONE-HALF of an axle bearing is used to form a jig for drilling dowel pin holes in axle caps at the Utica Park shops of the New York State Railways. The practice is to use two dowel pins for holding axle bearings. Some types which have keyways worn excessively are having two dowel pins installed while others which originally were provided with but one dowel pin are now being provided with two.



Bearing Used as Base of Jig for Drilling Dowel Holes in Axle Caps

The axle bearing used for a jig has two bushed holes for guiding the drill. The cap is clamped to the bed of the drill press by a special angle bracket which holds it in correct position so that the dowel holes will be located correctly. The use of a standard bearing for the body section of the jig insures correct fitting when bearings are once installed.

Maintaining Destination Signs in Los Angeles

SIGN maintenance on the Los Angeles Railway, Los Angeles, Cal., is carried out at the South Park shop under the supervision of Harry P. Koster. There are 4,726 metal dash signs in use on the system, and the maintenance of these is quite an item. In some cases a car has to carry eight dash signs for use on different trips, because it operates to various terminals. Signs are available for special runs to the principal crossovers.

These signs are maintained by the silk screen method, silk bolting cloth attached to a wooden frame being used. The cloth is treated with a composition of thick black varnish. When this is dry the desired lettering is outlined on the cloth, and the black varnish is carefully scraped away with a knife to remove the composition material so that the let-

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Dick Prescott Rides the Interurban

And Does Some Thinking

DICK PRESCOTT, engineer of equipment, and Steve White, carpenter shop foreman of the Consolidated Railway & Light Company, soon discovered what the Rushburg storekeeper had meant by saying that he didn't envy them their ride on the interurban to Trackton, the next stop on their trip of inspection. After visiting the large Rushburg property, Dick had planned on riding the Rushburg, Trackton & Middle Valley Electric Railway to Trackton in order that they might get any possible suggestions offered by the interurban equipment or service, during the next and last leg of their trip.

They took the street car to the point where the storekeeper had told them they could catch the interurban. Alighting at the lonely corner, which was on an unpaved street, they looked around to see where they would board the car.

"Where does the car stop, anyway?" growled Steve. "Think they might have put up some sort of a sign."

"Guess it stops over here where the city car did," replied Dick. "But they might at least mark the spot."

Looking at his watch, Dick saw that it was then ten minutes past time for the interurban to come. "They don't seem to care much about keeping the line on time, do they?"

"It's a different management from the one that runs the Rushburg lines, you know," replied Steve.

Just then the car came lumbering up and stopped in a cloud of dust—but on the opposite side of the street. They grabbed their bags and ran across to the car, the impatient conductor holding one hand on the bell cord and beckoning to them with the other.

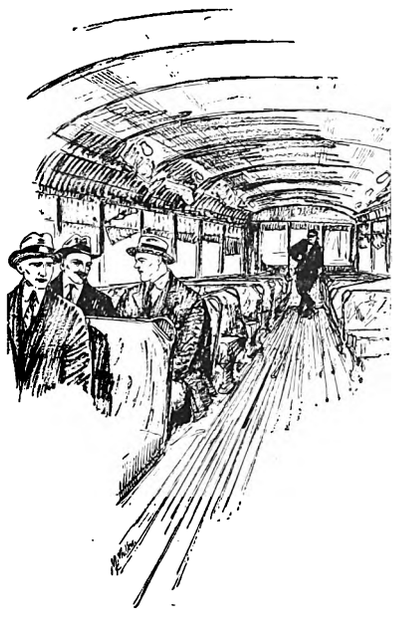
"Whew!" exclaimed Dick in an undertone to Steve as they joined the two lonely looking passengers that were already aboard when they swung on. "Gee! what a smelly car!"

"Smells like the morning after the night before," replied Steve.

"My, that odor of stale tobacco and smoke certainly could have been eliminated by a good scrubbing and airing. They've probably had this car standing out there in the yard all shut up waiting for the afternoon run, just as it was after being swept out last night."

They settled themselves in a seat. Both Dick and Steve noted the badly dilapidated appearance of the car. When it got well under way they unconsciously raised their voices above the low undertones in which they had been speaking, as the rattle of windows and creaking of the age-worn car body made conversation increasingly difficult.

"I don't see how a road with this kind of equipment can hope to attract passengers," finally remarked Dick, above the clatter and squeaking. Then to his chagrin he was aware that he had spoken loud enough for the passenger in front of them to overhear the remark. This man, apparently a resident of the district, was quick to volunteer a reply.



Glancing back over his shoulder at the two friends, he said, "This road would'a been dead long ago if it depended on its passenger business. They go after freight tooth and nail, but they don't seem to give a damn about passengers." "How far is it to Trackton?" asked Dick by way of changing the subject.

"'Bout 40 miles."

"Thank you very much."

After a few minutes of general conversation about weather and crops the stranger lost interest and again resumed his attempt to read a newspaper. As they continued along, his remark was confirmed as they passed several freight trains on the opposite track.

"I think they made a mistake in neglecting their passenger equipment," said Dick, cautiously resuming his conversation with Steve. "Even though freight is their big end, shippers get a poor impression by seeing dilapidated looking passenger equipment. In addition to that the opinion of the whole community is based on the road's passenger service. They certainly can't operate these cars without suffering in the eyes of the district they serve and in the opinion of the very shippers whose freight business they are trying to develop."

"You bet," replied Steve; "the steam roads learned that a long time ago."

"Well, we'll be in Trackton before long. One day there and then we're ready to start home."

"Back to home and Tom Mullaney," replied Steve.

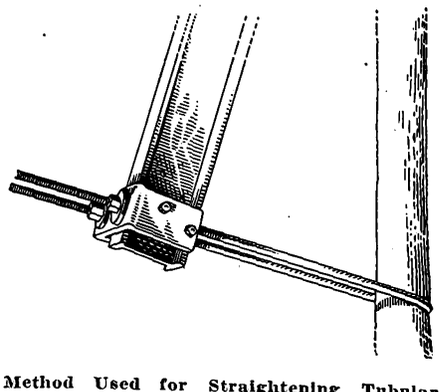
At this mention of Thomas Mullaney, general foreman of the Consolidated Railway & Light Company, and the immediate superior of Steve and Dick, the two travelers lapsed into silence as they watched the moving panorama of rural scenery through the dusty car window.

ters are outlined on the fabric of the silk, forming a stencil. This stencil is placed on a frame with four swinging supports, pivoted at the bottom to the bench and at the top to the sides of the frame. Blank metal plates are placed at both ends of the table, and the stencil is arranged so as to fall on the particular plate to be lettered.

Yellow paint is put on the screen and is rubbed across the lettering with a squeegee in the manner described in ELECTRIC RAILWAY JOURNAL for Dec. 15, 1923. When one plate is lettered, the frame is swung to a plate on the other end of the table and the operation repeated. In this way from 160 to 200 dash signs are turned out daily.

Pole-Straightening Device

BENT and twisted tubular poles were straightened recently by the line department of the Market Street railway, San Francisco, Cal., through the use of a rather simple device. A 7-ft. piece of 107-lb. Trilby rail served as the principal member. This was fastened to the pole at one side of the bend by means of a U-clamp, without removing the pole from the ground. Due to the bend in the pole, the other end of the rail projected out from the pole a distance depending on the amount of the bend. A longer U-clamp was used



Method Used for Straightening Tubular Poles by Means of a U-Clamp in San Francisco

at this end and a steel plate with nuts served as the clamping medium. This is shown in the illustration. By screwing down the nuts, pressure was produced sufficient to straighten the pole. By this method 150 poles were straightened at a cost of but $3.54 each. As one new pole would have cost about $50, there was a saving of approximately $7,000. In addition, labor of removing and resetting poles was not required.

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Signal Failures in Chattanooga Still Decreasing

CAREFUL maintenance of signals, which has been a feature of operation of the Tennessee Electric Power Company for several years, has resulted in a further decrease in interruptions to service from signals. The accompanying table gives a comparison for the years 1923 and 1924. Previous annual maintenance reports for these signals were published in ELECTRIC RAILWAY JOURNAL for March 19, 1921; March 18, 1922; Feb. 10, 1923, and March 1, 1924.

There are 42 Nachod signals in service, and during the past year there were but 66 instances of trouble. During this time the signals totaled 2,044,680 movements. This is a rate of one failure for each 30,980 movements, and the record shows an improvement of 3.3 per cent over the previous year.

During 1923 a portion of the signals and relays were overhauled and converted to the latest model. Trolley contactors for more than half the signals were painted and adjusted. The result is reflected in the record for last year. Many of these signals were installed sixteen years ago and have been in continuous service. The change to one-man operation made by the railway makes the signals more necessary than ever.

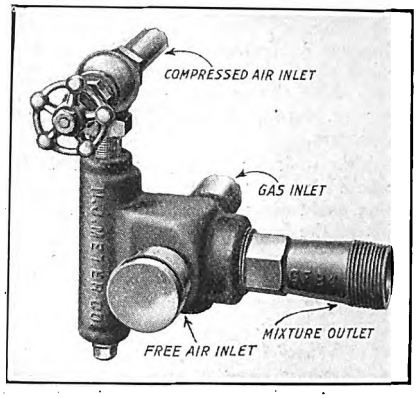
COMPARATIVE RECORD OF SIGNAL INTERRUPTIONS ON LINES OF THE TENNESSEE ELECTRIC POWER COMPANY, 1923–24

Trouble Found	1923	1924
Line wires	2	6
Fuses blown	15	7
Lamps out	8	10
Relay trouble	13	11
Setting contactor	4	5
Clearing contactor	4	1
Bad ground	6	7
Pole wiring	6	8
No trouble found	3	5
Miscellaneous	10	6
Totals	71	66
Number of blocks in service	21	21
Total yearly operations of all signals	2,124,680	2,044,680
Number of operations per failure	29,928	30,980
Average daily operations per block of signals	276	266
Average yearly operations per block of signals	101,174	97,746

Gas Furnace Blower

UTILIZING the principle of the injector, a new type of gas furnace blower has been put on the market by the New Jersey Meter Company, Plainfield, N. J. This blower, known as type GFB, has a screen chamber, jet nozzle and blast tube similar to the type FB forge blower made by the same company.

The intake to the blast tube, however, is inclosed and provided with two inlets, one for free air and one for gas. By this means the blower uses a small amount of compressed air at the jet and induces about 90 per cent of the air required. It also creates a suction on the gas, so that any desired quantity of gas can be drawn from the line, regardless of insufficient gas pressure.



The Injector Principle Is Used to Draw in Atmospheric Air in This Gas Furnace Blower

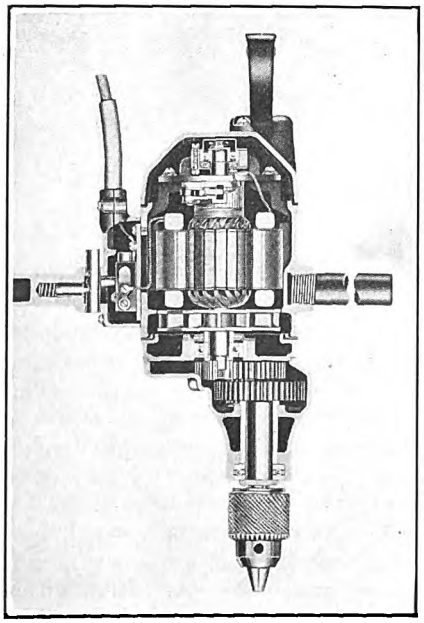
The air is regulated by a needle valve which controls the entire supply, both direct and induced. The gas supply is regulated by the usual gas valve. The volume of mixture, or intensity of the fire, and the proper proportion of gas and air are therefore controlled by the air valve and the gas valve, the same as in the ordinary system. The mixture pressure can be regulated from ½ in. of water column for low temperature work up to 7 in. or 8 in. water column, giving the maximum rate of combustion for treating high-speed steel, etc. It is claimed that the cost of compressed air is only 10 per cent as much as when all of the air required is taken direct from a high-pressure line. There is no chance of air backing up into the gas line, as the gas always enters and mixes with the air at a pressure slightly below atmospheric.

The gas furnace blower is made in three sizes. For ¾-in., 1-in. and 2-in. sizes of outlet pipe these will deliver a mixture of from 50 to 500 ft. of gas per hour.

New Equipment Available

Half-Inch Electric Drill

HOLES up to ½ in. can be drilled in steel with a new type of electric drill which is being marketed by the Hisey-Wolf Machine Company, Cincinnati, Ohio. The machine has a net weight of 17 lb. and runs at a speed of 525 r.p.m. without load. New features in the motor construction have been introduced so as to add more iron and copper than previous designs. The armature is hand wound and of the toothed type. This insures uniform magnetic flux distribution.



This Universal Drill Has a Capacity Up to ½ In.

Brush-holders are provided with adjustable spring tension and are mounted as a separate unit on bakelite yokes. This permits ready adjustment when necessary. A ventilating fan mounted on the armature shaft is held in place by a key so that it cannot work loose. The cool incoming air passes over the commutator and through the motor. An improved vent construction is added to insure protection against accidental or willful abuse. The inner races of the ball bearings on the armature shaft are locked so that they cannot slip. The gear end bearing is mounted with a floating fit in a hard cast-in sleeve to prevent binding and reduce friction.

The machine is provided with side handles which can be removed for close corner work. A spade handle is also arranged on top directly in line with the drill chuck. This eliminates side pressure, reduces friction and produces a saving in drill bits. This spade handle can also be removed for work in close quarters and pressure can then be applied directly on the end cover casting.

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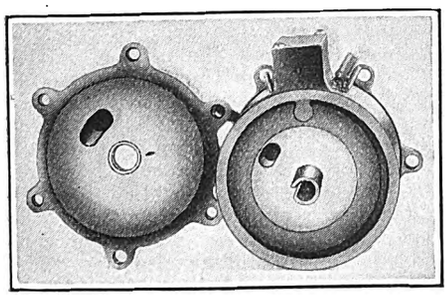
Valveless Air Compressor

OMISSION of the usual inlet and outlet valves and other interesting points feature a type of air compressor developed by John Milne, New York City. It is arranged to operate at high speed without flywheel, piston, crankshaft or pulley. The outlet ports function as check valves and do not register except when the gas or air is ready for discharge.

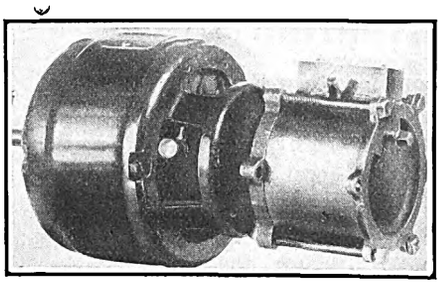
The machine consists of a cast-iron cylinder divided into two parts by a hollow partition. The hollow space is used for cooling by air or water. The circular parts on each side of the partition serve as compression chambers. Inside the cylinder are mounted an eccentric, a ring and a sliding nonrotating guide. The eccentric fits inside the ring, and the latter is guided by the sliding guide, which is located in the upper portion of the cylinder. As the eccentric is rotated the ring closes in on the inner wall of the cylinder.

At the start of a cycle a space between the ring and the inside of the cylinder is connected to the intake port. As the eccentric is rotated, the ring is thrown around so as to force the air or liquid to the opposite side of the cylinder, where compression takes place with further rotation. Compression continues until the outlet port registers, when the compressed air or liquid is discharged. The sliding guide not only maintains the ring in position but also serves to seal the outlet port and separate it from the inlet opening.



Rotary Compressor with Cylindrical Cover Removed, Showing Method of Operation

This new type compressor is compact and is composed chiefly of circular parts which are simple to construct. No coupling is required, since the unit is driven directly from the motor shaft, and no speed reduction is necessary. The operating or working portions consist of but three moving parts per unit. These are all inclosed within the cast-iron cylindrical chamber. Any number of units can be placed together to increase the capacity of the compressor. It is claimed that in operation the compressor is practically noiseless and vibrationless and that its weight and size are approximately one-third of those for reciprocating types of compressors. With the two-chamber arrangement, the compressed air or fluid from one chamber may be stepped up in the other to any pressure within the limits of compressor practice. Additional units may be mounted so as to perform separate functions if desired; thus two could be used for air and two for fluid, or one set could be used for compression and the other for producing a vacuum. The capacity of this type of compressor will range from ¼ cu.ft. to 10,000 cu.ft. and can be operated at speeds from 350 to 3,600 r.p.m.



Compressor Mounted Directly on Motor Shaft

General Purpose Motors

WITH the marketing of a new type of direct-current motor and a redesigned type of alternating-current motor, the General Electric Company, Schenectady, N. Y., is now manufacturing a completely revised line of "general purpose" motors. This line includes all standard speeds and horsepower ratings for use on any standard circuit. Some of the smaller direct and alternating-current motors, rating for rating, are mechanically interchangeable. The use of steel-shell babbitted bearings has been extended to cover all general purpose motors. While strongly advocating the use of sleeve bearings on its motors, the manufacturer has also made provision to furnish ball bearings if desired.

The redesigned alternating-current motors designated as KT-500 supersede the Kt-300 line. These motors are for use on polyphase circuits and are made in two types of rotor construction, the squirrel-cage and the wound-rotor design. Standard power ratings range from 5 to 200 hp. The squirrel-cage motors bear the designation KT-500, and the wound-rotor type, MT-500. All are of the skeleton frame type, both horizontal and vertical.

The redesign of the alternating-current types provides larger shafts and bearings, larger oil rings with lower oil level and larger oil reservoir capacity. The oil ring is retained in its slot by a guard permanently attached under the bearing screw. Other improvements include the use of spring oil well covers and improved insulation in the small, closed slot frames. The improved insulation, now included as standard on smaller sizes, makes these motors suitable for operation in places where special atmospheric conditions are encountered.

The new direct-current motors include both constant and adjustable speed machines. The bi-polar type bears the designation BD and the four-pole motors are designated as type CD.

The BD type are two-pole machines made in sizes from ½ to 3 hp., 1,750 r.p.m., and the CD type are four and six-pole, running from 3 to 200 hp. Speeds used are 1,750, 1,150 and 850 r.p.m., these corresponding with full-load speeds for General Electric 60-cycle induction motors. Thus the motors are interchangeable as far as speed is concerned, and this feature also applies mechanically to some extent to the frames used in the BD line. These direct-current motors are made for use on standard circuits of 115, 230 or 550 volts.

As a result of these changes, the standard lines of general purpose motors are much simplified. Alternating-current motors include the KT, MT and SCR types, the SCR, KT-900 and MT-900 machines having been introduced during 1923. All KT motors utilize the squirrel-cage rotor and are constant-speed machines for use on polyphase circuits. The MT machines are also for use on polyphase circuits, are constant or adjustable-varying speed, and utilize the wound rotor. Single-phase motors are covered by the SCR type, these being constant-speed machines ranging from ½ to 10 hp. The new BD and CD motors comprise the complete direct-current line.

An outstanding advantage is the standardization of renewal parts, particularly bearing linings for alternating-current types, both single and polyphase, thus enabling motor dealers to supply bearings for either alternating or direct-current motors from the same stock.

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Association News & Discussions

Many Prominent Speakers at Southwestern Convention

During a Busy Four-Day Session, Southwestern Utility Men Were Treated to a Program Rarely Equaled in Sectional Association Meetings—Railway Section Program Covered Many Subjects of Current Interest

RAILWAY men of the Southwest joined the other utilities of that section in the 30th annual convention of the Southwestern Public Service Association, which was held at Houston, Tex., May 5-8. Both in the size of the attendance and in the prominence of the speakers who took part the meeting marked an epoch in the affairs of the Southwestern Association and indicated the growing importance of the utility industry in that section.

In a forecast of the development and application of electrical science, Gen. Guy E. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, painted an inspiring word picture of the ultimate part which utilities may be expected to play in the affairs of mankind, providing the dead hand of bureaucracy and governmental interference does not dam the rising tide of research and enthusiasm. President J. N. Shannahan of the American Electric Railway Association outlined the modern conception of public transportation service and asked the co-operation of the Southwest in helping the American Association and its new manaaging director, Lucius S. Storrs, to unite the industry into a closely knit organization for handling national problems. Mr. Shannahan's paper appears elsewhere. Similarly, H. C. Abell, president American Gas Association, described the status of that branch of the utility industry and the service being rendered by its national organization.

Besides the combined sessions at which these significant addresses were made, sectional meetings of various technical divisions were held each day. At the railway section meetings papers on a variety of subjects of timely interest were presented and discussed frankly and fully. Some of the papers of most general interest to railway men are abstracted elsewhere in this issue. These include a paper on labor-saving equipment in trackwork by E. S. Meyers, New Orleans; a paper by W. W. Holden, San Antonio, on the use of buses in city service and a report on current collecting devices by L. E. Delf, Fort Worth, and G. F. Tongue, Dallas. Results obtained in the operation of treadle-controlled car doors in Dallas were described by G. I. Plummer. V. W. Berry, Fort Worth, presented a paper on the type of street car which may be expected in 1930.

Papers were also read by H. B. Hearn, Shreveport, and Alves Dixon, El Paso. Mr. Hearn's subject was publicity. He used the biblical injunction "Let your light shine" as illustration of the early understood necessity for publicity. Failure on the part of electric railway managements to continue the publicity which attended the promotion and building of early lines, he said, is largely responsible for the failure of the public to understand modern changed conditions. Although he expressed approval of the printed word as an effective publicity agency, he advocated increased attention to the training of employees in direct sales work with the public.

New Accident Classification Urged

Mr. Dixon treated the classification of accidents. He showed that present methods of classifying them fall far short of giving the information needed to determine either the detailed causes or to assist in preventing future recurrence of similar accidents. As an illustration of the confusion resulting from an analysis of accident records on the basis of the present classification, he cited the example of a derailment. He showed that an accident listed under this head might be caused either by defective track, defective equipment or carelessness. He further explained that the classification "collisions with automobiles" would show exactly the same state of affairs on the records if a given number of street cars ran into standing automobiles as if the same number of automobiles ran into standing street cars. Since it is impracticable to subdivide different kinds of accidents to a point which would eliminate such inaccuracies, he advocated a basic classification to show the following grouping: (1) Man failure (employee), (2) equipment failure (company), (3) man failure (public). He cited the experience of the El Paso property in progressively reducing accidents from 1,767 in 1921 to 611 in 1924 as an illustration of the improvement which can be made by basing accident prevention work on a careful study and analysis of the conditions encountered.

Practically all of the papers were actively discussed. One general comment made by Mr. Shannahan to the railway section was that most operators have too great a tendency to confine their attention to operating their individual properties, without looking around to see how similar situations are being handled elsewhere. He said that through Mr. Storrs every member of the industry will now have available a research agency which will enable him to draw on national experience for guidance in the solution of local problems which may develop after having been encountered before in several other sections of the country.

The meeting of the railway section was opened by a short address from C. J. Kirk, supervisor of utilities city of Houston, who said that the friendly relations between the city administration, the utilities and the people of Houston was attributable largely to the care that was being taken to avoid misunderstanding on the part of any of the interested parties. Such misunderstanding, he said, is largely responsible for most of the difficulties that arise between a utility and the public which it serves. He maintained that it is very important to empower local railway managers with sufficient authority to enable them to settle all local questions. He expressed himself as being opposed to the paving burden on electric railways, and also heartily indorsed the principle of a single combined transportation agency to serve all the needs of a given city.

Use the Association Facilities

Covering at some length the subject of co-operation between the national and sectional associations, J. W. Colton, editor *Acra*, outlined some of the services which the national association is prepared to render and urged that the association headquarters in New York be made the clearing house of information for the industry. Chairman Wood commented that the average operator hesitates to admit the need of advice or assistance from the parent association because of a feeling that such action is an admission of inability to handle individual problems on his property. He said this results frequently in an attempt to defend individual practice instead of seeking the benefit of the experience of others who have contended with a similar situation. Mr. Wood also discussed the subject of publicity which had been treated in Mr. Hearn's paper. He said that the information given the public must not be limited to the things that reflect credit on the railway management. To win public confidence, he insisted that all information in which the public may be interested, whether favorable or otherwise, be made available. Another sidelight was thrown on this subject by Richard Meriwether, vice-president and general manager Dallas Railway, who said that effective and sincere publicity can help matters only after the affairs and service of the railway have reached such a state that there is no hesitation in telling the whole story. Good service, he insisted, is in itself the best advertisement, and until this

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is really being rendered publicity will be of no avail. In using newspaper space, he advocated a complete and carefully worked out campaign prepared in advance as a necessary step toward getting the desired results from the money expended. Mr. Berry described briefly some of the practices in Fort Worth and advocated continuous effort toward the enlightenment and education of employees. J. P. Griffin, vice-president and general passenger agent Texas Electric Railway, Dallas, Tex., outlined some of the publicity methods used by his company for building long-distance interurban business.

Trolley Shoes and Wheels

The report on current-collecting devices, which was a comparison of results obtained with sliding shoes and trolley wheels, raised considerable active discussion. Mr. Berry pointed out that the reduction in costs as shown in the report were not all due to the use of sliding contact shoes, but were in large measure attributable to a higher standard of inspection and maintenance which reduced service failures. He also said that the cost of ears and sleeves has not decreased materially with the adoption of sliding contactors. The wear on the entire overhead system is greater, he contended, when both wheels and shoes are used than when the sliding type contactor is used exclusively. The opinion of those taking part in the discussion seemed to be that the most important objection to the use of shoes in city service where single-end cars are used is the difficulty of backing around Y's.

Some observations on the effect of shoes on trolley wire wear were described by C. L. Greer, superintendent overhead construction Galveston-Houston Electric Railway. He found that the wear produced by shoes in high-speed service is comparatively small, but that this condition does not hold near stations or other stopping places where cars slow down and start up. He showed samples of trolley wire less than eighteen months old that had been heavily worn at slow speed points on the line, while the remainder of the wire showed little effect of wear. He maintained that fittings last a shorter time with slide contacts than with wheels, but that the slide is very much superior to the wheel from the standpoint of dewirement.

A general round-table discussion of this subject of contact devices developed many views of the relative merits and limitations of slides and wheels. It was pointed out by those who had obtained favorable results with the slides that greasing of the trolley wire is an important factor in reducing wear, and also that wear is materially increased if wheels and shoes are both used on the same wire. G. H. Clifford, vice-president and general manager Northern Texas Traction Company, Fort Worth, and Mr. Meriwether both summed up the situation by pointing out that the question resolves itself finally into one of service, and that cost is of small importance compared with the maintenance of uninterrupted service. To this end, increased attention is being directed to overhead inspection so as to eliminate potential troubles and interruptions before they occur. This results in linemen spending their time inspecting the overhead system and making replacements as they are required, rather than answering emergency calls to repair broken lines.

COMING MEETINGS
OF
Electric Railway and Allied Associations

May 19-22 — **Chamber of Commerce of the United States, annual meeting, Washington, D. C.**

***May 20-21*—Central Electric Traffic Association, regular meeting at Tuller Hotel, Detroit, Mich.**

***May 25-26*—Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.**

***May 25-28*—National Association of Purchasing Agents, Milwaukee, Wis.**

***May 27-28*—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.**

***June 2-4*—Central Electric Railway Association, French Lick Springs, Ind.**

***June 3*—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

***June 3-4*—Iowa Electric Railway Association, Waterloo, Iowa.**

***June 10-12*—Canadian Electric Railway Association, Montreal, Quebec.**

***June 26-27*—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

***July 22-25*—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

***Oct. 5-9*—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

Bus-Operating Results

The paper by Mr. Holden on bus operation inspired considerable discussion and brought forth a comparison of bus policies in San Antonio and Houston. Mr. Wood said that the Austin bus line in Houston, charging an average fare of 6½ cents and carrying a heavy traffic on a comparatively short route, had earned $13,000 above interest, depreciation and operating expenses during the past year, but that other routes covering greater distances at this rate of fare have shown a decided loss. He contended that a minimum bus fare of 10 cents is necessary to make bus operation pay its own way on the average route in Houston. He described an interesting plan to furnish bus service to a new high-grade residence district on a basis where those interested in obtaining the service underwrite the operations, but explained that one of the important factors in this proposed arrangement was the length of contract and the form of bond required to guarantee the permanance of the line without danger of future loss to the company through being forced to continue an unprofitable service upon discontinuance of the original guarantee contract. He stated that the objective in instituting bus service in Houston was to make this service self-supporting and to develop it as an auxiliary, preferred, deluxe service in comparison to existing rail lines.

Mr. Holden described the failure of shuttle or feeder lines in San Antonio and also told about a plan for using the bus as a high-fare express vehicle in connection with a real estate development enterprise. A general discussion ensued of the field for application of buses and also of bus operation costs. An interesting difference in the practices of San Antonio and Houston relative to the taxing of transportation vehicles was developed by this discussion. Speaking of the situation and the views held by the city and the transportation company in San Antonio, Mr. Holden said that the principle followed there had been to charge the bus its full estimated share of paving maintenance by assessing a special license fee of $5 per seat per year, which was estimated as the cost of paving maintenance carried by street cars in that city. Additional state and federal license and tax fees bring the total per bus to approximately $600 per year. This high license cost, it was felt, would eliminate any question of unfair favoritism toward buses, and would at the same time discourage efforts of independent operators to institute irresponsible competition.

Mr. Wood contrasted the difference in viewpoint in Houston relative to this subject of co-ordinating bus and rail service. He said that here the general principle followed is that of relieving the car rider as far as possible from unwarranted indirect taxes for the benefit of property owners. Consequently there is a growing sentiment in Houston in favor of eliminating the paving burden from the car rider, rather than loading excess special taxes on bus riders to bring them into the same situation as present car riders. At the same time, he explained that a faithful fulfillment of every reasonable demand for transportation service is the only ultimate method of insuring freedom from competition.

Treadle Doors Make Saving

Further information on the experience of Dallas with the treadle-controlled rear-exit door was brought out in the discussion of Mr. Plummer's paper. In answer to questions he explained that interlocking of the rear door with the car control had resulted in a material reduction of accidents on the line using these cars as compared with records before the installation of the automatic rear doors. He also said that a saving of $36,000 per year on one line which has been made through one-man operation was made possible primarily by the use of the rear-treadle exit door, because one-man operation of this line before the development of the door had proved to be a failure and had been abandoned.

Accident prevention became the subject of a very lively discussion at the conclusion of Mr. Dixon's paper on classification of accidents. There seemed to be some question of the practical value of a rule of the Houston

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Electric Company that an operator of a street car must always have his car under such control when passing a street intersection or other vehicle that he is able to come to a full stop before a collision can occur. Mr. Plummer said that careful analysis of a large number of both class A and B accidents shows them to be caused in the great majority of cases by man failures. He advocated continuous work rather than intermittent campaigns as the best method of reducing these failures through education and training. Mr. Berry described the organization and functions of a special board of three men, which has full charge of the investigation and classification of accidents on the Fort Worth property. Mr. Holden said that best results had been obtained in San Antonio by the appointment of a special accident investigator charged with the responsibility of keeping accidents to a minimum. He favored this centralization of responsibility as more effective than any form of divisional organization.

A similar general discussion took place regarding the car of the future as outlined in Mr. Berry's paper of the type which will be specified in 1930. Improved appearance, noise reduction, better lighting and better riding qualities seemed to be the qualities considered of most importance from the standpoint of meeting public demand. It was noticeable that there was little discussion of measures for reducing maintenance or operating costs, but that thought seemed to be directed toward measures for increasing riding through furnishing greater attractiveness and comfort, rather than in the direction of economy in maintenance. Mr. Holden presented some interesting figures to show how comparatively small increases in patronage would pay for various improvements that were considered for cars in San Antonio.

At the conclusion of the business session, W. W. Holden, superintendent traction department San Antonio Public Service Company, was unanimously elected chairman of the railway section for the ensuing year. During the succeeding meeting of the general session W. E. Wood, manager Houston Electric Company and chairman of the railway section during the past year, was elected president of the entire association.

Registration figures for the meeting reached nearly 500. In addition there were many guests present who did not register. The social program was a full one for both delegates and their ladies. This included dancing, golf and cards, and also a trip on the Houston deep-water channel to the famous San Jacinto battleground.

Serving the Public Better*

By J. N. SHANNAHAN
President American Electric Railway Association

SOUTHWESTERN utility men are doing progressive, constructive work. One of your companies, the Northern Texas Traction Company of Fort Worth, in 1924 won the Charles A. Coffin award, the highest honor that can come to any electric railway in the United States. And the achievement of that organization was but one of the many in your utility field of which the state may well be proud. It is no exaggeration to say that the local utility companies of the Southwest rank as high, collectively, as those of any section of the country.

Remarks made recently at association headuarters in New York by one of your transportation leaders, Luke Bradley, indicate the reasons for the success of your transportation properties. He said:

> We believe that we are local transportation men in the fullest sense of the word. Our business is to provide rides. While the major part of our properties are composed of electric railways, we are not confining ourselves to supplying rides by them alone. Today we are going into the bus business because buses supply a helpful supplemental service. We shall continue to use them as requirements demand. If other transportation agencies are needed, we will add them to our service. "Give the best possible local transportation of all kinds, regardless of method," is and will continue to be our motto.

This is the far-seeing idea that local transportation men are adopting generally. They are in the business of moving the people, and will continue in it.

The method of handling passengers, however, is only one factor of the transportation business. Of even more importance to transportation and other utilities is the subject of good public relations. You men of this association are in the van when it comes to dealing with your riders. You are square shooters in that, as you are in other business dealings. The old-time long-horned public utility man today is as scarce as the old-time long-horned Texas steer. And the passing of the long-horned breed has been just as helpful to the utility business as it has been to the cattle business. Neither ever made much progress. The horns, while picturesque, never could be cashed in at much value. Often they were only in the way.

Improved Public Relations

Just as public relations have improved in the Southwest, so have they improved throughout the entire utility field. They have improved largely because the companies have told the truth to their public, and the public has come to appreciate the service and to understand the men behind it. If you doubt that the utility story is being told broadly and effectively, look around at the international meeting of the Associated Advertising Clubs of the World here in Houston next week. It is estimated, I believe, that more than $11,000.000 is being expended annually by utility companies for advertising alone, and I am proud to say that some $3,000,000 of this amount is being spent by the local transportation companies.

Advertising through the printed word, however, is only one means we are using to serve our public better. We are trying to reach our customers through each employee connected with our industry from executive down through superintendents, carmen, office help and all. We are trying to inculcate into every one from car cleaner to president that our duty and pleasure is to provide the best possible transportation as cheaply and effectively as possible.

The idea of serving the public better for the dual reason that it is more pleasant and more profitable is rapidly permeating our industry. No better proof of this can be found than in the recent selection of Lucius S. Storrs as our managing director.

One of the reasons I was glad to accept your invitation to address you was my desire to tell you about this recent move on the part of the American Electric Railway Association. Some of us have realized that one of the respects in which the association was failing to achieve all that might fairly be hoped for was in not tying the owners of the properties into the active work of the association. You all know that in the settlement of great questions of policy vitally affecting the life of the companies there is a point beyond which the operating man cannot go. A number of these questions no doubt occur to you at once. So the executive committee directed the formation of what is known as the advisory council of the association, composed chiefly of owners of the properties. This advisory council quickly realized that if its work were to be creative, if it were to function efficiently, it could only be by working through one man. This could be no man of ordinary ability, but one capable of carrying out its policies; a man of high and splendid abilities. As one after another of the members of the council set forth the qualities they deemed desirable or essential in a managing director, it seemed to some of us that such a man could not be found. But happily, he has been found in the person of Lucius Storrs.

As president of the Connecticut Company, one of the largest local transportation organizations in the world, he made an enviable record. He gave service with his heart, hand and mind, as well as by cars and buses. His riders showed their appreciation by relieving his company of unfair charges and by increasing their patronage. He never had a strike on his property. Nationally, long before he became managing director he worked arduously for every movement which came before the industry. In him we have a leader who will help us all in giving better local transportation.

Through the creation of the advisory council of owners we can, and are, tying all utility associations closer together. Their objects in general are alike, and in many respects identical. Everything is to be gained by knitting them more closely together. I am reminded of that old saw, "In union there is strength." The same elements of society that are found fighting one of these utilities at one time are found arrayed against another at a different time. They fight us piecemeal and not infrequently beat us. We need to band

*Abstract of address made before Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

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together for defense, for study of our common problems and also for united action.

In one respect, I am sorry to say, Texas is falling behind her sister states. That is in not recognizing in her statutes what is otherwise so obvious—that the bus is a common carrier. More than three-quarters of the states have recognized that fact in recent enactments and have placed buses under the control of the various state commissions. Curiously enough, as soon as a wildcat jitney grows up to be a bus and is operated on a regular route, then its owner ardently desires regulation, and the protection that regulation gives him from other wildcat and irresponsible operators. In that connection, I cannot close without drawing your attention to a national situation, one in which you all can help. I refer to the status of interstate bus operations. Two months ago the Supreme Court of the United States handed down a decision in which it said that the states are without power to regulate such traffic. Two cases brought forth this dictum, one originating in the State of Washington and the other in Maryland. We are told, on the other hand, that the Interstate Commerce Commission is without power in the premises, nor is there any other federal body in which such power resides. And so the carriers, steam, as well as electric, find themselves being taxed to build and maintain highways over which this interstate bus traffic is eating out the very vitals of the carriers themselves.

There is now being drafted, under Mr. Storrs' direction, a bill to remedy this impossible situation; a measure fair alike to the public, to the bus operators and to the older carriers. In drawing the bill he has sought and obtained the co-operation of the National Automobile Chamber of Commerce, the American Railway Association, the Short Lines Association, the National Electric Light Association and the National Association of Railroad and Utilities Commissioners. Now, here is where you all can help. When this bill is ready for presentation, a copy will be sent to each one of you. It is our hope and desire that you make it your business to see your own Congressman (and any others you know) and convince him, before he returns for the next session of Congress, of the fairness of this bill, and the desirability, aye, the necessity, of promptly enacting it into law. Gentlemen, we ask your good offices in this matter. You can do vastly more with Congressmen at home than you can in Washington.

Current-Collecting Devices*

BY L. E. DELF† AND G. F. TONGUE‡
†Electrical Engineer Northern Texas Traction Company, Fort Worth
‡Assistant Engineer Dallas Railway, Dallas, Tex.

VERY little data have been obtained on the relative costs between the use of trolley wheels and sliding contact. The information available indicates, however, that the cost of shoes is considerably greater than the cost of wheel operation. It is quite possible that some of the costs for wheel operation do not represent actual conditions inasmuch as the 1924 report of the American Electric Railway Engineering Association committee on equipment indicates that wheel costs per thousand car-miles range all the way from 2 cents to 33 cents. Very few properties maintain an accounting system whereby they can accurately segregate cost of current-collecting devices. Opinion seems to be quite evenly divided as to the effect of the sliding contact on the cost of maintaining the overhead wire system and the trolley poles and bases, although experience seems to indicate that the wear on unlubricated trolley wire is greater when the sliding contact is used.

At the midyear meeting of the Maintenance of Way Section of the Southwestern Public Service Association held in Fort Worth on Feb. 4, 1925, the authors were appointed a committee to secure information on various devices for trolley current collecting with special consideration to a comparison between trolley wheels and sliding contact devices.

In view of the very little information available on the subject of comparative results between the use of trolley wheels and sliding contact devices, the Northern Texas Traction Company of Fort Worth has compiled some data covering a period of six years. During 1922 this property discarded the use of wheels entirely on both the interurban and city divisions and adopted the Miller trolley shoe.

As the following tabulations will indicate, 1922 covered a period during which the change from wheels to shoes was made, and both wheels and slides were operated during this year. This property has approximately 173 miles of trolley wire and operates a total of approximately 8,600,000 car-miles per year. The following tabulations have been arranged so that wheel and slide operation are readily comparable.

The above figures indicate that the mileage obtained from the slide contact on the city division is approximately the same as that obtained from wheels. The same holds substantially true for operation on interurban trains. The city division has effected an appreciable saving in the cost of trolley wheels and slides during the period of slide operation. The cost on the interurban division has remained substantially the same.

A method of building up wornout slides has now been perfected, so that the cost figures shown above should be greatly reduced during the coming year. A new slide costs $1.50. By building up old slides with electric arc welding and grinding the contact surface the cost of replacement slides is now running 16 cents per slide. Item No. 4 shows up quite clearly the total saving that has been made on this property by the adoption of slide contacts and item No. 5 shows the tremendous reduction in trolley breaks brought about in the past four years.

It has been found that the trolley shoe clings to the wire very much better than does the wheel, even when passing through the large amount of special work that is found on the city division. The drumming noise on the roof of the car has been practically eliminated by the use of the slide. This property does not use sleet cutters, and during a recent severe sleet storm, which tied up a number of lines in this territory, service was main-

*Abstract of report presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

COMPARISON OF TROLLEY WHEELS AND SLIDES IN FORT WORTH, 1919-1924

	1919	1920	1921	1922	1923	1924
1. Mileage of Trolley Wheels and Slides:						
City Division						
Trolley wheels	4,656	7,085	6,445	4,343	....	....
Trolley slides	....	....	....	7,844	6,661	6,308
Interurban Division						
Trolley wheels	5,195	2,778	1,754	....	....	....
Trolley slides	....	....	1,247	1,651	2,311	2,972
2. Cost of Trolley Wheels and Slides per 1,000 Car-Miles:						
City Division						
Trolley wheels	$0.324	$0.236	$0.449	$0.306	....	....
Trolley slides	....	....	....	0.228	$0.237	$0.239
Interurban Division						
Trolley wheels	$0.312	$0.615	$0.896	....	....	....
Trolley slides	....	....	1.639	$1.070	$0.709	$0.507
3. Cost of Trolley Wheels and Slides as Whole Including Harp and Fittings) per 1,000 Car-Miles.						
Both Divisions						
Trolley wheels	$0.848	$0.960	$0.144	$0.861	....	....
Trolley slides	....	....	4.00	1.160	$0.928	$0.868
4. Total Cost of Car Equipment Material (Trolley Pole, Harp, Wheel or Slide, Rope and Fittings) and Cost of Line Material (Trolley Wire, Ears and Splicers):						
Car-miles	8,029,243	9,044,829	8,782,208	8,422,863	8,485,715	8,671,596
Car equipment	$6,723	$6,735	$6,545	$5,409	$4,107	$3,530
Line material	16,653	22,440	17,283	8,566	6,159	6,153
5. Trolley Breaks and Wire Strung.						
City and Interurban Divisions						
City breaks	No	No	313	178	73	47
Int. breaks	Data	Data	45	13	5	2
Wire strung, ft.	117,584	133,622	127,332	67,394	63,870	40,217

3. Cost of Trolley Wheel and Slide:

Wheel only	$1.39	Slide only	$1.50
Harp only	1.69	Harp only	1.77
Fittings	.92	Fittings	1.28
Total	$4.00	Total	$4.55

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tained without interruption except for one burn down which tied up service for about an hour.

Comparing the operation of the years 1919 and 1920, during which wheels were used exclusively, and 1923 and 1924, during which slides were used entirely, the cost of trolley poles was reduced from an average of $771 per year to $282 per year, or a decrease of 64 per cent. The cost of trolley rope was decreased from an average of $1,566 per year to $611 per year, or a decrease of 61 per cent. The quantity of trolley wire used for maintenance purposes was decreased from 125,603 feet per year to 52,044 feet per year, or 59 per cent. The above figures include both city and interurban divisions.

It was found that the slide could not be operated satisfactorily on the grade of trolley wire on this property without lubrication of wire, and consequently a system of periodic greasing once every month was inaugurated. The cost of this greasing has averaged $2.12 per mile per year, which is a very nominal amount compared to the savings effected.

Trouble reports, due to frogs throwing trolleys and dewirements in general, have decreased materially, and both city and interurban trainmen are very enthusiastic boosters for the trolley slide.

The Street Car of 1930*

By V. W. Berry

General Superintendent Northern Texas Traction Company, Fort Worth, Tex.

"1930 MODEL CARS" will vary in size according to service requirements. In the smaller cities and on light traffic lines in the larger cities weights and seating capacities which will permit frequent headways and low operating costs will be universally used. In medium size cities and for the greater part of the service in the larger cities cars of greater weight and capacity will be extensively used. On some of the heaviest traffic lines in the larger cities multiple-unit trains of two or more cars each will be used. The use of the various sizes will depend upon service requirements in the different cities and localities, and there will be no specific standard size of street car in 1930.

Appearance and attractiveness are recognized to be of great importance in merchandising. In general, the exterior appearance of the 1930 model street car will not differ materially from the present type, except that square corners will be rounded off and the appearance will be further improved by painting with brighter and more attractive colors. The result of effort along these lines will be to produce a car more attractive and pleasing to the eye. The interiors of present cars offer an opportunity for decided improvement. The rough floor, exposed valves, control, apparatus and pipes, inefficient and unattractive methods of illumination and the many unsightly corners and angles contribute to a condition not at all attractive.

Improved riding qualities will be a feature of the 1930 model street car. One has but to take a ride on a 1900 model longitudinal-seat car, operated at a speed to meet present schedule requirements, to realize that much progress has already been made. Further development in this direction is even now actively under way.

Until recent years, little attention was paid to the noise made by street cars, but the comparison furnished by the automobile is directing attention to this factor in increasing degree. There are many things that contribute to the noise of car operation. Some of these sounds are of minor importance at their source, but are amplified by the sounding board effect of the car body and other parts of the equipment until they become very objectionable. Operating on a surface of smooth steel rails, it appears quite possible to reduce materially, if not entirely eliminate, all of the objectionable noises of the street car. Scientific study of the causes will result in elimination of the noise at its source, or will so damp it that it will not be objectionable.

Cost of operation will not be materially reduced by the use of the 1930 model street car. The added expense of providing the many improvements to the car, so necessary from the standpoint of merchandising, will effect economies resulting from the further use of light-weight cars. This will be accomplished by the use of better materials in construction. Thus reduced weight and scientific application of proper sized units to a particular service will just about offset the added expense occasioned by improvements in the cars. These improvements will make the street car continue to render a local transportation service superior to that of any other public vehicle.

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Labor-Saving Equipment in Trackwork*

By E. S. Meyers

Superintendent of Roadway New Orleans Public Service, Inc., New Orleans, La.

WE HAVE been and are using continuously in New Orleans four side dump trains and one center dump train, each train consisting of a motor car and trailer; the capacity of each car is 20 cu.yd. or 40 cu.yd. per train. The trains are used on both construction and maintenance jobs for hauling sand, gravel, slag, ties and excavated material.

The center dumps are more economical than the side dumps when operations are confined to single track, as they discharge and scatter material directly in the track, whereas with side dumps, the material would have to be shoveled into the track at additional cost. On double track ballast is deposited in the track by either the center dump operating over the track requiring material, or by the side dumps discharging from the opposite track directly into the track requiring the material. The side dumps are used to advantage in hauling sand and gravel and distributing it on jobs when street paving is in progress and where tracks are to be built of concrete construction. Besides a saving in the actual material and hauling charge, there is a resultant economy in concreting due to the fact that there is less hauling distance to the mixer.

During 1924 our company built 8.5 miles of concrete track construction and reconstructed 26.6 miles of track, using slag as ballast.

We recently performed some work that permitted a good comparison between the cost of placing material in the track with a flat car and a Differential train. The figures are based on a 5½-mile haul and an average day's work, the same crew required for either the flat or the Differential. The crew worked ten hours at a total cost of $11.10.

The flat car train consisted of one small motor car and a 15-cu.yd. flat car. Unloading took nine men twenty minutes, or a total of three man-hours. at 30 cents per hour. This was 90 cents for unloading labor. The total material hauled in a day was three loads or 45 cu.yd. This made the cost of unloading 6 cents per yard. To this was added the cost of the train crew ($11.10 ÷ 45) or 25 cents per yard, making a total of 31 cents per cubic yard handled.

The Differential motor and trailer had a capacity of 20 cu.yd. each and also made three trips a day, hauling 120 cu.yd. The material was unloaded directly into the trench, the only labor being that of the train crew, $11.10. Thus the cost per cubic yard was $11.10 divided by 120, or 9 cents per cubic yard. This indicates a direct saving of 22 cents per cubic yard handled.

Summing up the quantities handled in 1924, exclusive of excavated material, the total saving would be: 46,799 cu.yd. at 22 cents, $10,295.78. In addition a saving of $9,000 was made in the cost of handling excavated material which is sold for filling purposes and which costs about 15 cents per cubic yard to unload from flat cars.

For excavating construction jobs, we use a 5½-cu.yd. Marion electric shovel, mounted on a caterpillar tractor. When the machine is not in use for excavating, we replace the shovel with a clamshell bucket and use it for handling special work, slag and unloading heavy material. The weight of this machine is approximately 60,000 lb., and we transport it from place to place on a large Freuhauf trailer.

On a recent excavation job due to a change in street grade, which involved moving approximately 16,000 cu.yd. of material, the labor cost of operating the machine was as follows:

One operator, ten hours at 80 cents	$ 8
Four laborers moving mats, ten hours at 30 cents	12
Total cost per day	$20

The largest run made was in a stretch 485 ft. long by 10 ft. wide by 3.5 ft. deep, in which 646 cu.yd. of material was removed at a cost of 2.9 cents per cubic yard. The average cost

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of digging the material and placing it alongside the track was 4 cents per cubic yard. The cost of removing about 200 ft. of the same trench by hand cost us 60 cents per cubic yard, so that the saving made by the machine on this one job was $8,960.

We also have a Haiss loader, which, although designed primarily to handle loose material, has proved very satisfactory for digging out trenches where the material is dry and mixed with shell such as we find in our old roadbeds. We also use this machine to good advantage, removing dirt excavated by hand and piled alongside the trench, loading directly on to our Differential cars at a cost of 8 cents per cubic yard.

A Barber-Greene conveyor mounted on rubber-tired wheels is used in connection with the Haiss. The city is always desirous of getting the filling from our tracks to top unimproved streets. Frequently arrangements are made whereby they drive alongside our conveyor and the material is discharged directly into their carts, thereby saving us the cost of extra handling.

As the bearing power of the soil in New Orleans is very weak, we find it necessary to place concrete slabs under the tracks at all paved intersections. For this purpose we purchased a 7-L Jaeger tilting drum concrete mixer with loader, operated by electric motor and mounted it on an electric truck. The capacity of the mixer is 7 cu.ft. of mixed concrete. The machine is operated directly alongside the trench depositing its material right in place, thus saving a hauling charge. The working capacity of the machine is approximately 125 cu.yd. per day, based on a 1:2:4, one-minute mix.

The following is the cost of labor per cubic yard of concrete in place on a job 112 ft. long:

Material haul to mixture.....100 ft.
Mix 1:2:4.....1 minute
Time required to mix 25 cu.yd.....2 hours
Labor 20 men, two hours at 30 cents....$12
Concrete.....25 cu.yd.
Labor cost mixing and placing concrete $12 ÷ 25 cubic yards = ...$0.48

We have three oxyacetylene motorcycle outfits for general cutting. The tanks are mounted on a specially designed side car, which in turn is welded to the motorcycle, comprising a compact outfit. These machines are equipped with 100 ft. of hose, each torch having a complete set of cutting and burning tips so that it can cut rails, bolts, and burn holes as desired.

When reconstructing track we cut the old rail up in 10-ft. lengths. The tie rods are also cut and sold to the junk dealer. The cutters are invaluable when large special work changes are required.

We have recently conducted some tests to show the effect on the steel due to burning holes with the torch. We find that the metal is affected for a distance of only ⅛ in. from the hole, and that only a thin crystallization film is observed at the hole surface. Our conclusion is that burning does not impair the strength of the metal.

Welding, Grinding and Bonding Outfits

In the early part of 1921, out of a total of 210 miles of track, 55 miles was in paved streets, 64 miles in unpaved streets and 191 miles in neutral or reserved strip. The track in the neutral ground was generally of tee rail construction and in paved and unpaved streets of various 9-in. trilby and tram rail sections, all joints being of bolted construction. A large percentage of this track was in a deplorable condition, due to loose bolts and worn joint places which required everlasting attention.

Our company decided on a broad program of seam welding these joints. To carry on this work and for subsequent welding operations, we have the following equipment:

8 Type WW RWB dynamotors.
1 Type B RWB dynamotor.
1 G. E. motor-generator set.
1 Wilson O-B bonding dynamotor.
3 Oxyacetylene cutting outfits.
2 Universal rotary grinders.
1 Reciprocating grinder.
1 Small portable electric hand grinder.
1 Large self-propelled Goldschmidt grinder.

Four of the Type WW RWB dynamotors are each mounted on a Graham-Dodge truck, one on an electric and three of them on 1-ton Ford trucks. Each truck has a specially designed body to carry the welding machine, and all the supplies and equipment. The O-B Wilson bonding machine is mounted on an all welded side-car attached to a motorcycle. This outfit is also used as an emergency welding outfit. The G. E. motor-generator set, the type B RWB dynamotor, the three cutting outfits, the small portable electric hand grinder and the Goldschmidt grinder are part of the welding shop outfit.

Our portable welding machines are used on all new construction jobs where seam-welded joints are used, also for the purpose of reclaiming crossings, frogs, switches and mates by making them flange-bearing with manganese. In the last 2½ years we have welded more than 50 manganese switch points, and to date have not had a single failure.

We have reclaimed crossings that would have been replaced, before we installed this equipment. In the repair of hard center manganese work, we have been called on to repair crossings having the old style hard center with stirrup plates that are held in place by keys. Where the stirrups have broken off we use the oxyacetylene torch to cut out the broken part. The blacksmith makes new ones which we weld in with manganese electrode. By the manganese process we make the crossings flange-bearing and practically noiseless.

On mates of the manganese insert type, where it is difficult to remove the insert, and where part of this insert has failed, we have reclaimed the mates by cutting the broken part out with the oxyacetylene torch, and then welding in a low carbon base to the form of the original piece. This is covered with one layer of manganese steel, after which it is ground with the rotary grinders.

Besides welding trackwork, we weld in our shop all kinds of castings, steel, cast iron and non-ferrous metals, including truck frames, bolsters, axles built up, armature shafts, etc.

For use with pneumatic tie tampers as well as for breaking concrete, we have two portable units. One unit is an Ingersoll-Rand belt-driven compressor and the other a direct-connected Westinghouse compressor. Both machines are 110 cu.ft. capacity, operating either four tampers or two concrete breakers each. The machines are mounted on electric trucks which were rebuilt at small expense for this purpose. The use of portable machines is advantageous as we can run around the city from one job to another without loss of much time. The operator of the truck has charge of the tamping gang of four men. All tamping is under his supervision.

We have recently purchased and are using a Jackson electric tie tamper for maintenance work. This tamper is giving satisfactory results so far and is operating with the same labor and at approximately the same cost as the pneumatic tampers. However, we do not get as good a job with the Jackson as we do with the pneumatics. With the exception of rough surfacing of the track, these machines have eliminated all hand tamping.

Treadle Car Operation*

By George I. Plummer
Superintendent of Traffic Dallas Railway, Dallas, Tex.

IN DISCUSSING the rear door treadle car I must necessarily refer to our experience in Dallas, since Dallas was the pioneer in the construction and operation of this type of car.

The construction of the new type automatic rear-exit equipment was the result of careful study and application of our experience to the operation of one-man cars. Service conditions were critically analyzed to devise means whereby the car could be loaded and unloaded quickly in all kinds of traffic. We sought to avoid the difficulty of slowing down traffic by waiting for slow moving negro passengers to leave the car. Our method of traffic control by means of synchronized semaphores made it necessary to have quick stop and get-away features. In heavy traffic the services of outside fare collectors and loaders was necessary. In the light of all these requirements our traffic department, in co-operation with engineers of the National Pneumatic Company, finally developed a type of mechanism and method of operation that seem to be highly satisfactory.

The car immediately met with favor on the line, where previously a single-door one-man car had been operated, but was removed on account of public disfavor. This line serves the most exclusive residence districts in the city of Dallas. All of these high-class homes have numerous negro servants and the race problem was, therefore, present. We found that the negroes were very quick to adapt themselves to the change, thus completely solving that particular problem.

During the rush hours this rear treadle door is operated from the outside by street collectors for loading.

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

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This permits a maximum load to board the car quickly. The result has been that the earning capacity of this car has been about the same as the two-man cars previously operated on the line, with the same schedule and headway, except slightly increased headway during the rush hours made necessary on account of increased riding brought about on account of popularity of the car.

When it became necessary to substitute two-man cars, with longitudinal seats, a protest was immediately lodged with the city officials—the people claiming that they were entitled to the newer type of car on that line all the time. These were the same people that previously had objected to, and caused the removal of the small one-man cars from their line.

While the first twenty cars were built on permit of the city officials, who were very careful to prevent any publicity prior to the completion of the cars, the result of their operation has been such that they have unhesitatingly granted permission for as many additional cars as the company desires to equip. The cars have met with universal satisfaction, have eliminated complaint on account of negro problems, uncomfortable jerking of car and aisle congestion, with the economies possible in one-man operation. In our candid opinion they have solved the problem of one-man car operation on properties in the larger cities on heavily traveled lines, particularly in the South. We feel that this car can be used on any city lines, regardless of the amount of traffic, with approximately the same number of cars as would be necessary with two-man operation and at approximately the same schedule speed.

Management and Operation Advisory Board

REVIEW of the work accomplished to date was the principal matter under discussion at a meeting of the advisory board of the management and operation committee of the American Association, held May 9 at association headquarters, New York. Up to date 69 field reports and 221 detail reports have been received. District 2 is in the lead in the number submitted. In order to get all of the material in sufficiently early to formulate the annual report of the committee, it was proposed to send out a letter to all members of the committee requesting their co-operation.

For the annual report of the committee, it was proposed to have seven district reports combining the city and interurban work and to have an eighth report from Canada. It was considered advisable to publish articles in *Aera* and technical magazines previous to the convention if the matter justifies it.

It was decided that such material as is received and is considered worth while be published in a handbook. The recommendation of the advisory board is that the handbook be published in permanent form, uniform in size and style with the Association Proceedings and the Engineering Manual.

Regarding the use of a booth at the Atlantic City convention next fall to hold exhibits of operating companies, it was considered inadvisable to request companies to exhibit material illustrating poor maintenance methods.

A letter received from W. H. Boyce was read. This was to the effect that the attention of the industry should be brought to the desirability or necessity of good housekeeping, particularly about shops, carhouses and yards. The letter was commended by the advisory board.

Members present were: R. F. Carbutt, New York, vice-chairman; R. B. Stearns, Boston; R. W. Emerson, Cleveland; W. H. Boyce, Pittsburgh, and Samuel Riddle, Louisville.

American Association News

Heavy Traction

SUBJECTS proposed for inclusion in the annual report were discussed at a meeting of the heavy traction committee of the Engineering Association, held at association headquarters, New York, on May 8. Those present were: J. C. Davidson, chairman; A. H. Armstrong, H. F. Brown, Morris Buck, A. H. Candee, representing H. W. Cope; A. H. Daus, J. T. Hamilton, Norman Litchfield, Mr. Wilkins, representing L. S. Wells, and G. C. Hecker, special engineer.

Protective coatings for iron and steel were the subject of considerable discussion. Mr. Hecker reported that a sectional committee of the American Engineering Standards Committee has been formed to take up the subject of standardizing zinc coatings. It was felt by the heavy traction committee that the subject of protection against corrosion of metals used in electric railway service be given consideration, in addition to the subject of zinc coatings. It was proposed that the committee on subjects of the Engineering Association assign this topic to a special committee next year.

Mr. Brown stated that the bibliography of heavy electric traction has been completed and turned over to the secretary of the association. A motion was passed to determine the cost of keeping the bibliography up to date each year. The secretary was requested to obtain from the Association printer an estimate of cost of publication in bound form in an addition of 500 or of 1,000 copies. It was proposed that he take up with other associations interested the publication of the bibliography. In this way it was felt that the cost could be shared by a larger number of persons so that it would not be burdensome.

Mr. Armstrong presented a tentative report for the sub-committee on branch line electrification and self-propelled cars. This report was accepted, subject to comments of the committee members.

A preliminary report on the subject of articulated trains was presented by Mr. Daus. This was received as a report of progress.

Bibliography on Heavy Traction Now Ready

CONTAINING a selected list of references on all subjects connected with heavy electric traction and railroad electrification, a new bibliography has just been prepared by the heavy traction committee of the Engineering Association. References are included from nineteen English-speaking papers and ten foreign-language papers. All of the entries are made by years and are cross-indexed so that reference can be made in a number of ways. Each periodical is given a reference number, so that it is easy to locate all articles that have appeared in one publication. There is a cross-index by authors, another by companies and localities, and a third by subjects. Thus the engineer who is interested in research from any particular angle will have no difficulty in locating practically every article published on the subject.

At present, the bibliography is in manuscript form and is on file at the office of the secretary, 292 Madison Avenue, New York City. It is available for inspection by any one interested Plans are now being made for publication in permanent form.

Revision of the bibliography will be made each year. The arrangement is such that articles appearing in successive years will be grouped together, so that such additions will be easy to make. Plans are now being prepared for carrying out this annual extension of the bibliography, so that it will always be up to date.

Buildings and Structures

SEVERAL subjects for inclusion in the annual report were reviewed at a meeting of the committee on buildings and structures held at association headquarters, May 7. Those present were W. F. Graves, chairman; F. H. Miller, sponsor; J. D. Kent and H. R. Stamm.

In considering existing standards, the committee decided that the miscellaneous methods and practices regarding design of small bridges, culverts and trestles should be changed to conform with recommendations of the bureau of simplified practice of the United States Department of Commerce. The subject of design of buildings for storage and maintenance of buses and that of bus terminal design have been combined and will be reported on together. A large number of plans and photographs of recent constructions were gone over and decisions were made as to which of these should be incorporated in the report.

The subject of terminals for buses has been divided into those for city and those for interurban operation. City terminals have been further subdivided into buildings leased and rearranged for a small number of buses without storage; terminals with facilities for simple repairs; terminals with garages combined, and bus terminals without garages. Interurban terminals were

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subdivided into bus terminals proper and combined electric railway and bus terminals.

Desirable features of terminal design were decided upon, such as location, width and distance between loading platforms, housing area, height from top of finished floor to lower chord of truss, material, equipment, heating, lighting, ventilation, fire protection, oil and gasoline storage.

In reporting on the various designs, statements will be incorporated to show outstanding features. A compilation has also been arranged of the salient features of a large number of bus garages. This will be included in the report.

Carhouse and car shop standards were considered. The question of modification of the specification for carhouse wiring was left open, awaiting a decision from the special committee which is studying this subject.

Manufacturers' Night at the Metropolitan Section

SERIOUS business and burlesque were intermixed at the meeting of the Metropolitan Section of the American Electric Railway Association held May 8 at the Engineering Societies Building, New York. The topic of the evening was "Boost the Railways." The meeting was in charge of manufacturer members. Carl Beck of the Westinghouse Companies acted as chairman and Jerry Stanton of the Ohio Brass Company acted as secretary.

The session opened with the principal business of the evening, an address by Lucius S. Storrs, managing director of the association. Mr. Storrs' address is abstracted elsewhere in this issue. Following the address, humorous reports were read by the acting secretary and other manufacturer members representing the various officers and committee members. Harry Vanderveer, National Pneumatic Company, delivered a paper which consisted principally of its title, and L. T. Carter, General Electric Company, gave an extemporaneous speech without a subject.

Following this phase of the program, an entertainment was given by Joseph Dunninger, who mystified the audience with several clever mind-reading demonstrations. Other entertainment was furnished by the Peddlers' Troubadors. Following the meeting a buffet lunch was served.

The Electric Railway—An Indispensable Service*

The New Managing Director of the Association Points Out That the Electric Railway Is Responsible for the American City of Today, and That the Continuance of Urban Prosperity Depends on It

BY LUCIUS S. STORRS
Managing Director American Electric Railway Association

WE ALL represent one of the greatest if not the greatest industry in America. With but a single exception all of the 288 cities of the United States having a population of 25,000 or more are served by an electric railway. Some of them are a little frayed around the edges, but they are serving the people, however. There are 44,000 miles of electric railway tracks. Some people said a part of that was going to be ripped up, but it was a very small part. There are 100,000 electric cars operating over those tracks and 300,000 people are employed in this most useful service, receiving a gross annual payroll of $450,000,000.

The value of this electric railway plant constitutes 2 per cent of the national wealth, or $5,624,000,000.

Last year the electric railways carried a total of 16,000,000,000 passengers, or 140 rides for each inhabitant of the United States. Our steam railroads are vital to our country, but they carry per annum less than one-tenth as many passengers as are carried by the electric railways, and last year all of the steam railroads in America carried 100,000,000 passengers less than were carried on the surface lines of the City of New York.

The growth of the American cities has been made possible largely, if not solely, by the expansion of the electric railroads. Due to the enthusiasm of the executives in the early days of the electric railroad, the electric rail lines have not been confined, as they are quite generally in European cities, to the built-up sections of the cities. We would then have had, in this country as abroad, a reproduction of the congestion of the population within limited areas instead of the growth of residential districts throughout large areas.

In 1890, when the electric railway industry was just beginning, the population of the United States was about 63,000,000. Today our population is nearly double that. The last national census showed that half of the total population is in the cities and towns of 8,000 inhabitants or more. As late as 1900 only one-third of the total population was urban. The next census will show the rural population to be considerably less than half, I am sure, for the trend toward the city has not stopped.

The cause of the growth of the cities and large towns lies in the tremendous industrial development of the nation. Wherever there is a good manufacturing site, with good transportation facilities, there has been built up a thriving city or town. No city can grow and expand if there is not good transportation service. This service has been supplied by the electric street railway.

What are the outstanding inducements the people of a community make, even today, to a prospective industry? Are they not something like this: "We have a fine street car system, a fine location for your plant, good freight facilities, good power supply, nearness to your source of raw materials and accessibility to your markets, contented inhabitants and a good supply of the kind of labor you need."

CAR LINES HAVE MADE PROSPERITY

The electric railways have not only made it possible for manufacturers to do business profitably, but they have opened up vast tracts for residential purposes, they have increased the value of the entire community, created markets for the merchants, the farmers, the lumber dealers, the department stores, for everybody. Sometimes the business these trolley lines did returned them a profit, but in many cases the investment that made profits for others was a losing one to the railway investors.

Of the 43,000 miles of electric railways in the United States, 26,000 are in the cities and towns of 8,000 and more, and 17,000 are through rural districts. They are not decrepit lines. They are not "busted." They are serving the cities and towns day in and day out for nominal returns.

We all know that there are many lines that are not paying ventures, but the reason is not that the services the lines render are not necessary ones. The reason is that the electric railways have been fair prey for every demagogue who cared to attack them, preventing them from getting fair and just consideration from the public. The franchises under which they operate, subject to complete public control as to rates of fare and quality of service, have been declared by the demagogue to be "million dollar grabs," whereas, in fact, they have been nothing more than permits to render the public a vitally necessary service for a mere pittance.

The public has been deluded by this kind of talk, and only during the last year or two has it begun to awaken to the fact that such attacks are more damaging to the community than they are to the railways, although we know very well that they have been tremendously damaging to us. The demagogue talks about "protecting the people" against "the interests," and the pity of it is that "the people" for a time take the demagogue seriously. The demagogue shouts for public ownership, the "5-cent fare" and the destruction of the investment that has made possible the creation of the great cities of this country, whereas, in fact, all that he seeks is the perpetuation of himself and his followers in public office.

If he could put his program through, he would make every job on the system a political one. Efficiency would count for nothing—the losses would be absorbed by the taxpayers. But there are signs that the people are getting on to the demagogue. A game of that kind can be played only so long. The public demands service, and when the

*Abstract of an address before the Metropolitan Section, A.E.R.A., New York, May 8, 1925.

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demagogue doesn't give it, when he gives only denunciation and vituperation, the people size him up for what he is, and sooner or later rid themselves of him.

In a city like New York, where politics continually beclouds economics, the services which the electric railways have rendered, are rendering and must render in the future are not always recognized nor appreciated. Yet, were it not for the rapid transit system which has been developed here, New York could not be the great metropolis that it is. The electric railways have built up this city just as they have built up all the great cities, and for that matter the small cities in America. I challenge any one to name one prosperous, thriving, progressive community that did not win its prosperity and wealth and assure its future through the services of its local electric railway company.

It is not so many years since the first skyscraper was built in lower Manhattan. Today there are hundreds of them to which every morning, and from which every afternoon, there are carried millions of human beings. As you know, they come from the Bronx, from Westchester, from Queens, from New Jersey, in electric trains and electric surface cars. Were anything to stop the services which the electric railways render, this great city would quickly be deserted. This community depends absolutely on its transportation facilities.

There is no need for me to emphasize these facts to such an audience as this, but it is well perhaps to declare again the absolute essentiality of the business in which we are engaged. We are rendering an indispensable service. The electric railway systems of this country are the very arteries of our urban life. I have no fear for their future, because I know that nothing can take their place. There are tremendous problems to be worked out to make them more efficient and to win for them the public recognition and sympathy to which they are entitled, but regardless of these problems, the fact always remains that these lines, whether they be in New York City or in some town of 25,000, are absolutely essential to the prosperity and security of the country and the comfort and convenience of the individual.

The latest United States census of electric railways shows that in 1922 each inhabitant rode 116 times—at least that was the average. Some doubtless walked, and we know something about automobiles. In 1890 there were but 32 revenue rides per inhabitant. The number of revenue rides is much greater in the cities. In 1922 there were 257 per capita, an increase from 109 in 1890. In the City of New York last year the electric railways carried a grand total of 2,672,940,319 passengers. That was on increase of 100,000,000 over the number carried in 1923. The per capita rides in the City of New York have increased from 218 in 1890 to 448 in 1924. While the heaviest increase has been on the rapid transit lines, the surface lines also have carried increased numbers of passengers. The surface lines alone carried 1,061,402,247 passengers last year. These figures do not include the passengers carried by the Williamsburg Bridge line. There has not been a year since 1860, when records of the Transit Commission begin, until the present, that has not shown an increase in the number of total passengers carried.

The figures themselves are sufficient refutation of the statement that the surface railways are obsolete and must be supplanted by some other form of transportation. That kind of talk is plain buncombe. A few months ago the merchants of 42d Street and of 125th Street uttered vigorous protests against any scheme that would deprive them of surface car service. These people are awakening to the danger of impairment of their service, and sooner or later they will arise and compel a fair deal for the street car.

Real Estate a Principal Beneficiary

The owners of real estate have been the particular beneficiaries of electric railway service. All of us know of scores of instances of value being created by the building of an electric railway. The real estate man advertises, "Twenty minutes to city hall by subway," "Street car service to all parts of the city," and so on. Swamps and barren sandlots become colonies of apartment houses and comfortable dwellings when the rapid transit lines and the street cars come. You have seen it right here in New York, and all of us have seen it throughout the country.

Thirty years ago, when electric railway service was just beginning, the population of New York was under 3,000,000. There were no skyscrapers. At that time the valuation of taxable real estate in New York was approximately $2,500,000,000. As time went on, the genius of Sprague, Westinghouse, Thomson, Edison, Coffin, Hedley, and all the others who have contributed to the greatness of this industry, was at work, and today you have a city of more than 6,000,000 of inhabitants with taxable real estate valued at nearly $11,000,000,000, a sum of money the human mind cannot comprehend. I will say in all seriousness that New York's greatness was created by its transportation companies. Its future greatness depends just as much on the provision of additional electric railway service.

So well understood is this fact in other parts of the country that the states and communities have taken steps to assure the people of continuity of electric railway service. In Boston, for example, and throughout eastern Massachusetts, the people, through their legislative bodies, have provided for the payment of operating deficits, should they occur, through taxation of the communities served. Small towns are empowered to make appropriations to be paid to the electric railway companies to assure the continuance of street car service. In some places, usually very small towns where the electric railway could not operate profitably and the security holders had to give up, the towns themselves have assumed the operation of the lines at public expense.

The point of these remarks is merely this: The street car, whether it be a rapid transit subway train or a one-man trolley, has proved itself to be as necessary to the people as their water supply or their fire department.

Consider how steadily the use of the electric railways has increased. In 1902 they carried some 4,775,000,000 passengers; in 1907 they carried 7,440,000,000; in 1912 the traffic had grown to 9,545,000,000; in 1917 to 11,300,000,000; in 1922 to 12,680,000,000, and in 1924 to 16,000,000,000.

These figures may be a little dull, but they are tremendously significant of the place the electric railways have in the civilization of the United States.

I have no fears for the future of this industry. I am most optimistic about it. I know that you have no fears about it. What we are all most concerned about is the problem of getting the public to understand this business as well as we understand it, and to treat our problems as economic ones and not as political ones.

Public Is Beginning to Appreciate the Problem

Progress is being made along these lines. I believe that the public is beginning to understand that the wholesale attacks which are made upon the electric railway companies are unjust and based on falsehood. I have faith in the intelligence of the American people, once the people are informed of the facts. The big job before all of us is to bring about this public understanding of our business. Any electric railway man in fifteen minutes can demonstrate to any reasonable-minded person that were it not for the service his company renders and has been rendering, his community could not enjoy its present wealth and prosperity. It will not do for us to sit back and complain about the injustice of those who are attacking us. We have got to get out and state the facts. We cannot bring about complete public understanding in a few days, nor perhaps in a few months, but by steadily keeping at the job we shall in time reach the goal. In the past we have been too prone to writhe in silence under attack. Today our attitude should be different. We all know that we have something to sell, which we offer at a low price, and which the public needs and must have. We must insist on a fair deal.

I have been an electric railway man for 20 years. I am still an electric railway man, and I expect to continue to be an electric railway man. Most of you men have been in this business as long and perhaps longer than I have. You will all agree with me that it is the greatest business in the world, a business in which men fight shoulder to shoulder against tremendous odds, a business in which the fighting spirit is developed to its highest pitch, a fighting spirit that is directed to the service of the people, that makes men go without sleep and without food in order that the cars may run, a spirit that makes men undertake dangerous tasks with small personal profit, a spirit that is indomitable.

This spirit is born in us. Here's to the electric railway industry and to the 300,000 men who are running electric railways throughout this broad land, men who never say die, who never quit under fire, and whose lives are devoted to the service of their fellowmen.

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The News of the Industry

No Strike in Cleveland

Men Voted on May 9 Not to Seek to Contest Open Shop Plan—Wages Advanced 5 Cents

Cleveland's street railway system has been put upon the "open shop" basis without a strike of its platform employees. Upon the refusal of John J. Stanley, president of the Cleveland Railway, to agree to a wage increase of 10 cents an hour and to sign a contract with Division No. 268 of the Amalgamated Association, the Cleveland men took a strike vote by secret ballot on Saturday night, May 9. The result was that 1,352 decided against a strike and 1,150 for a walkout. It would have taken a two-thirds vote to call a strike.

Mr. Stanley's refusal to sign a new contract with Division 268 was based on the grounds that the courts had held such a "closed shop" contract illegal. He voluntarily gave the men an increase of 5 cents an hour starting on May 1. The older men in the company's employ voted solidly against a strike.

For the present, the company likely will allow each carhouse to choose a representative as a member of a general committee to meet with company officials in matters of dispute. Later a permanent arrangement between the company and the men will be effected, but there will be no recognition of the union.

It will also no longer be necessary for new employees of the company to become members of the union within 60 days after getting work, nor will there any longer be arbitration of disputes between the company and men.

Mr. Stanley announces that there will be no discrimination against employees who belong to the union, but that the men themselves will have to decide whether they want to continue to belong to the union. They will not be compelled to retain membership.

Rockford in New Franchise Tangle

Members of the retiring City Council at Rockford, Ill., passed the revised ordinance granting the Rockford City Traction Company a franchise after Mayor Hallstrom warned them that a veto of that resolution would be his first official act in the new administration. Mayor Hallstrom was re-elected last month, although the particular franchise he advocated and made an issue in his campaign was rejected.

David D. Madden, Corporation Counsel, says the franchise was "junked" when the Mayor failed to sign it before the outgoing body adjourned *sine die*, but Col. Arthur E. Fisher, counsel for the railway, claims the Council is "a continuing body and the law gives the Mayor a certain length of time in which to consider the ordinance. Silence on his part, or failure to act within that time, makes the act valid. But he must veto it to make it invalid."

Arthur D. Mackie, speaking for the railway, answered the Mayor's complaint that sections were unfavored by him by saying that even more sections were unsatisfactory to the company, but that it was a "give and take" adjustment. Mr. Mackie said that unless the Mayor vetoed the franchise the traction lines would attempt to have its bondholders and operating management accept the franchise and place orders for some $350,000 street improvements which have been delayed pending the outcome.

Detroit Municipal Employees Receive 3-Cent Increase

An increase of 3 cents an hour is provided by the new wage scale for conductors, operators and bus drivers of the Detroit Street Railways, Detroit, Mich., the first increase of 1 cent an hour to become effective June 1. Increases of 1 cent an hour will also be applicable on July 1 and Aug. 1, making the total increase of 3 cents an hour to be added to the present rates of 62 cents, 68 cents and 70 cents an hour. Pay for overtime is increased 5 cents in all three grades, bringing the rate for overtime up to 80 cents an hour. It was further recommended that the working time of platform men be kept as nearly as possible within eight-hour limits.

The increase is the result of a conference at which were present members of the Detroit Street Railway Commission, executives of the Department of Street Railways and a committee representing the Amalgamated Association. Following the conference the proposition was submitted to the railway employees, who approved it unanimously at a meeting on May 9.

In response to former demands the men had been informed by the Mayor that nothing could be done until after May 1. The Mayor stated previous to the meeting at which the proposal was adopted by the men that if the agreement was approved it would become effective without a resulting increase in fares or the curtailment of service.

In connection with the wage increase it was brought out that the employees of the Detroit Street Railways were exempt from the regulation by the City Civil Service Commission, according to an opinion given by Paul T. Dwyer, assistant corporation counsel. Mr. Dwyer quoted from the public act adopted 1909, which states that each city may in its charter provide within a reasonable time after the acquisition of a public transportation utility that the officials in charge of the operation shall establish a system of civil service for the selection and retention of its employees. His opinion stated that until such time as the officials in charge of the Department of Street Railways establish a system of civil service or determine to subject the department to the Civil Service Commission, and the Charter is amended to provide civil service for the department, the Detroit Street Railways is not amenable to the civil service act.

Toledo Board Against Doherty Plan

Ultimate collapse of the transportation system in Toledo is foreseen by the Board of Street Railway Control unless officials of the city and the Community Traction Company take prompt measures to save the situation.

The board is emphatically opposed to the proposal of Henry L. Doherty for sale of $2,000,000 of 8 per cent preferred stock and shifting of control to Toledoans. It looks upon the plan as unsound and stands by its previous recommendation that there must be some specific plans for improved service, discharge of financial obligations by the company to the city, repair of tracks and streets, and lower fares. It holds that some changes must be made in the Milner ordinance.

The letter from the board received by Council on the evening of May 11 was referred to the railroads and telegraph committee. Mr. Doherty may be asked to come to Toledo in an effort to speed up some kind of settlement of difficulties.

Coincident with the presentation of the letter of the Street Railway Board of Control the City-Wide Motor Coach Company, headed by M. Wiener, Cleveland, asked for a 25-year franchise for a complete bus system to charge 5-cent fare with a 1-cent transfer charge. This plan was referred to the railroad committee for further consideration.

In its reply to the Doherty proposal the car board declared that the plan would not stand the test of sound banking principles. The board declared:

> Since the adoption of the Milner ordinance, interurban and city transportation methods have undergone radical changes. The more general use of automobiles has caused the average number of street car rides per inhabitant to be reduced.
>
> It is apparent that the fixed operating charges of the railway at Toledo are so large that even with high fares the earnings are not sufficient to comply with the ordinance requirements.
>
> Mr. Doherty proposed that Toledo citizens purchase preferred stock of the Community Traction Company, in the sum of $1,500,000; that he likewise invest an additional $500,000; that he turn over to Toledo investors the common stock of the Community Traction Company and that the operation of the railway be placed in the hands of the proposed local purchasers of stock and put under their control.
>
> It is possible that local control and operation of this property might result in securing an adequate system of transporta-

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tion with improved service, rehabilitated tracks and street pavements, and with reduced rates of fare. It is, however, certain that local investors would not be attracted to this proposition unless the capital structure of the company is changed so that the new money going into the property to rehabilitate it and provide for expansion will have a priority over the present bonded indebtedness, and further that there be an agreement providing essential modifications of the Milner ordinance.

We cannot look with favor on the suggestion that Toledo citizens purchase $1,500,000 of the preferred stock of the company as we do not consider the investment either sound or attractive.

The board counsels the city and company to take prompt and drastic action to forestall the possibility of competitive transportation.

Frank R. Coates, who has represented Mr. Doherty in the negotiations, declared this attitude of the board against competition in the transportation for the city was a hopeful sign.

Safety Parade on Fifth Avenue

Barron G. Collier Stages Show to Impress Public With Need for Care—10,000 on Parade—Schools Suspend—Demonstration Regarded as Great Success

EVERYBODY except the right person appears to have got prominent mention in the New York newspapers in their accounts of the parade on May 11 that ushered in safety week. The name subordinated to others in most of the accounts was that of Barron G. Collier, special deputy police commissioner, the grand marshal. True, his picture along with that of Mayor Hylan and Police Commissioner Enright graced the official program and marching order, but as a newspaper personality Mr. Collier wasn't in it with Mayor Hylan shaking hands with Mrs. Joseph C. Conlon of Queens.

10,000 Persons Parade

Mr. Collier conceived the parade with the hope of again bringing home to the public the message of safety and at the same time driving in a keener realization that the safety of the individual is interdependent with that of others. As he sees it the keystone of the work of the bureau is to install safety consciousness and to inculcate those principles upon which is based the greatest and most effective power which can be brought to bear upon the causes of accidents — carelessness. Hence the idea of the parade as a vehicle for attracting attention, getting newspaper space and driving home the message intended to be conveyed.

There were 10,000 persons in the parade. There were 115 floats, 55 of which were "safety first" creations, and there were 36 bands. Three thousand children were in the line of march. Conspicuous among the marchers was "Aunty Jay Walker," who disapproves so heartily of jaywalking. Another feature was Dick Collins, veteran Indian fighter, and his old ox cart.

There are no stouter adherents to the safety program than the electric railways and the steam railroads, and despite the physical limitations imposed by the equipment they operate these companies participated heartily in the program for the week and in the parade. In fact a section of the parade was arranged with the idea of showing the evolution of transportation, the pageant including the Indian with his pony, the early doctor's swayback horse, the ox cart, jaunting cart, Colonial coach, one horse shay, first horse car, the first trolley, the tandem, the first bicycle, the old Broadway squad, the hansom, the first motor, the first automobile truck, the automobile of 1912, the modern bus, taxicab and pleasure car. The increasing danger of the evolution of the means of transportation was emphasized throughout and the importance of "safety first" continually impressed.

The Second Avenue Railroad dug up from its museum of antiquity a horse car used in the parade and actually drawn by horses, while from another source a car was obtained to use on one of the floats. In the case of the car mounted on the float wooden horses were made to substitute real ones. Among other exhibits of particular interest were the following:

A float of the Long Island Railroad depicting the dangers of railroad grade crossings.

A miniature railroad grade crossing with crossing gates down, automobiles waiting at the crossing, and a working model of a steam locomotive with wheels running at the rate of 60 miles an hour just entering on the crossing. This float shown by the Pennsylvania Railroad conveyed the lesson of extreme care required when approaching railroad crossings.

A scenic painting showing a little girl who has fallen down on her hands and knees in front of an approaching automobile, the driver of which has brought it to a successful stop before striking the child.

Two buses loaded with 105 laughing school children testified to the statement that these children represent 105 boys and girls whose lives were saved from accidents by safety work in the schools last year.

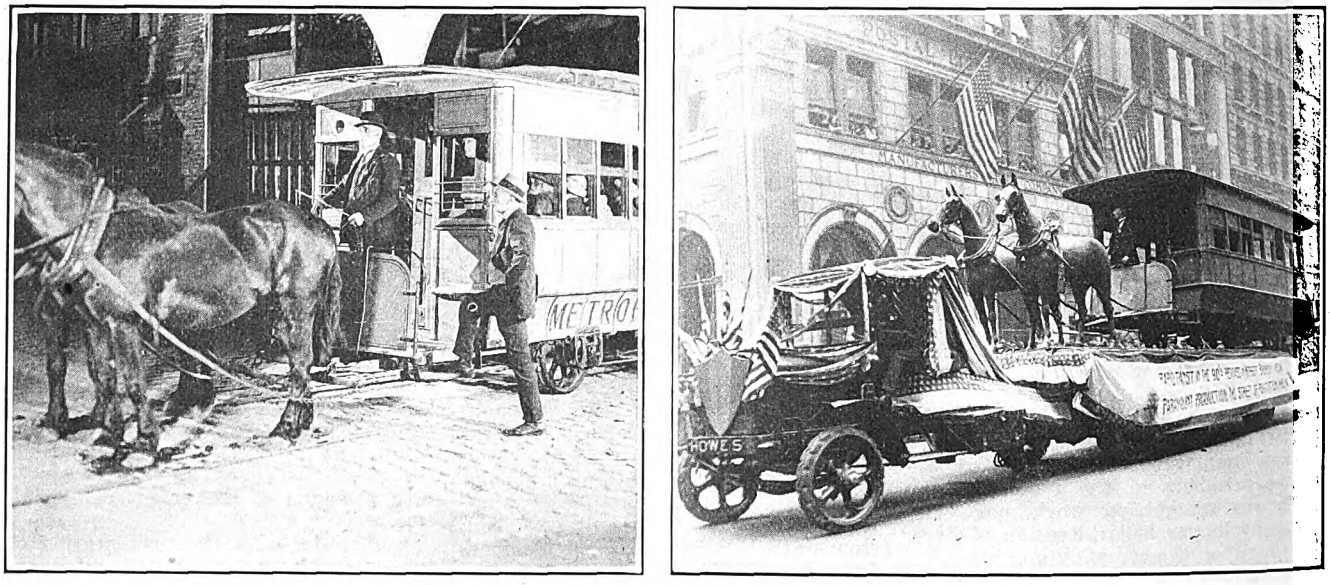
"Crossings" — New York Central Lines float showing safety signals at railroad crossings. Embodies need of care at grade crossings.

"Dice"—National Casket Company. An enormous pair of dice bearing the grim message "Don't gamble with Death."

It is three years since Police Commissioner Enright placed in Mr. Collier's hands the great trust—the great task—of making the streets of the City of New York safe for pedestrian and motorist alike. These three years have been fruitful indeed.

The bureau of public safety of the Police Department is justly proud of its many accomplishments—of the service which it has rendered in the conservation of human lives—in the lessening of vehicular accidents. Credit for this record should go to Mr. Collier, perhaps, more than to any other individual. Mr. Collier, however, sees it more in this light:

But it is to you—the people of our city who have made this record possible; who have realized that safety is a personal, an individual matter—that we give thanks and grateful acknowledgment. To you this parade is dedicated.



Horse Cars Resurrected to Show Evolution of Transportation

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Connecticut Men Consider New Working Terms

Meetings of the executive board of the state trolleymen's organization have been held recently in an effort to whip into final form the new agreement to be submitted to the Connecticut Company, New Haven, Conn. The present agreement expires on June 1.

The present scale of wages is 53 cents an hour as the minimum and 60 cents an hour maximum with 7 cents additional for operators of one-man cars and time and a half pay for overtime work.

No indication has been given of the probable tenor of the request for a readjustment of the terms under which the men work at present.

One-Man Car Hearing in Dayton in July

The case to test the legality of the ordinance passed by referendum in 1923 abolishing one-man cars in Dayton, Ohio, will be heard by Judge Smith Hickenlooper in the United States District Court at Dayton on July 6.

Attorneys for the five railways aver that the referendum is unconstitutional. The railways are operating the one-man cars under an injunction granted by the court pending the final disposition of the case.

In the original petition, it was pointed out that an ordinance was passed by the City Commission in 1921 permitting the use of one-man cars. This ordinance was outlawed and a new one drawn in 1923 as a result of a referendum vote in which the public demanded the two-men cars.

Before the time for the ordinance to become effective the railways secured an injunction and since have operated the one-man cars.

City attorneys contend that a number of persons were injured because of the absence of the safety devices and that for this reason the cars were voted discontinued.

Fare Question Up in Dallas

C. W. Hobson, chairman of the board of the Dallas Railway, Dallas, Tex., says that the favorable decision in the Geller suit cleared up one point, but that the Dallas Railway cannot borrow new capital until the time limit is removed from the 6-cent fare. At present the company is operating under Everman plan No. 3, which grants a 6-cent fare until June, 1926.

Borrowing of new capital for the Dallas properties is regarded as necessary before the improvements sought by the city can be carried out. Under the franchise the city has exclusive control of the reserve funds, to which the earnings of the company go after the authorized return on the investment has been allowed.

Most of the reserves are practically empty.

The Geller suit contested the city's right to regulate fares. It was decided in favor of the Dallas Railway and the city. The court held, in short, that the question of the fare necessary to yield the company an adequate return is both a legislative and judicial question and one which the Board of Municipal Control is competent to decide without referring the matter to the voters.

Men in Oakland Want Wage Increase

May Day brought with it a demand from the 1,100 platform men employed by the Key System Transit Company, Oakland, Cal., for an eight-hour day and an increase in wages to $6 a day. The matter will go to conference.

George Durand, president of the local union, made this statement:

> Carmen work a ten-hour day. They receive 65 cents an hour, or about $145 a month. We feel, however, that we are entitled to an eight-hour day and a wage of $6 a day. The case concerns the public. No other organization in Oakland maintains the 10-hour day and only one or two businesses operate on a basis of more than eight hours.

In the event of disagreement at the present conferences, the men have the right to appeal to the board of directors, and after that contested questions may be decided by arbitration.

Light Up, Ladies!

The New York Transit Commission has granted the application of the Brooklyn City Railroad to permit smoking during the summer months in the rear part of the new type center-exit cars. The action was taken in the interest of comfort. Commissioner Harkness said:

> Smoking seems now to be more prevalent. Formerly women generally objected. Now I doubt whether the majority of women would object. It is probable that a sizable number of them would like to avail themselves of the permission now given to smoke in the rear part of the cars. If they so desire, I know of no law against it.
>
> Some years ago, smoking was allowed on the last car on elevated trains. This practice was done away with, but I am not sure but what it could not now well be restored.
>
> If, without increasing the difficulties of operation and without giving undue annoyance to others, more privileges can be allowed the riders as an offset to the present intolerable discomfort of riding, I am in favor of doing so. Of course, smoking in subway cars is out of the question.

The new cars will replace open bench cars on Flatbush Avenue and the company felt that it was highly desirable to continue the privilege of smoking on the new cars. Pictures of women indulging in the weed were taken for use in Pathé news.

Opening of Railway Celebrated at Coral Gables

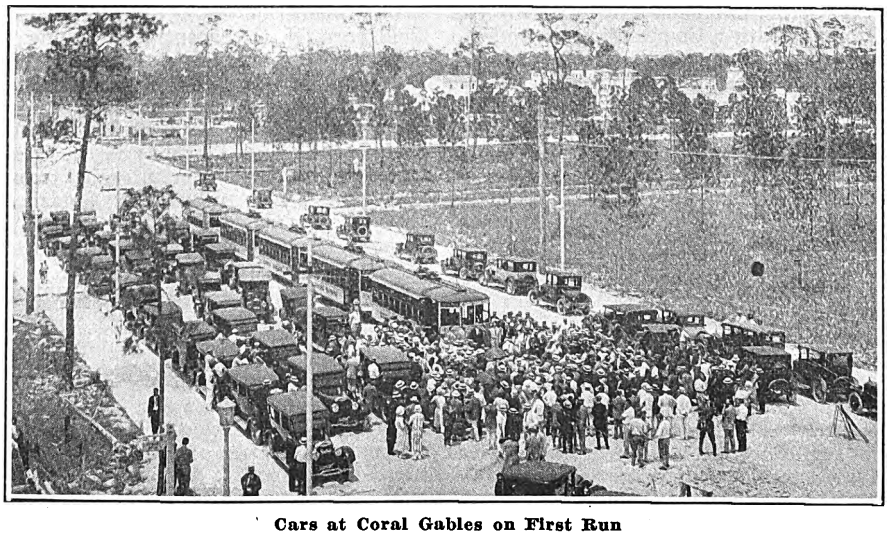
Five new cars bought by the Coral Gables Corporation were put into service on April 30 over an extended railway which connects the city of Miami and the city of Coral Gables, Fla.

Upon the arrival of the cars at the terminus of the line at the administration building of the Coral Gables Corporation, they were met by a crowd of residents. William Jennings Bryan made the address of welcome.

It was significant that upon the opening of the new railway Coral Gables became a city through the enactment of a bill by the Florida Legislature. The occasion of the arrival of the cars was, therefore, a joint celebration, at which the new Mayor and the City Commissioners were introduced to the public.

The Mayors and the City Commissioners of near-by towns, the bank presidents, heads of Chambers of Commerce and other prominent citizens were the guests of the new Mayor of Coral Gables, Edward E. Dammers, and of George E. Merrick, owner and developer of Coral Gables, on the initial ride from the carhouse, located half way between Miami and Miami Beach, through the city of Miami and over the new line from Miami to Coral Gables.

At the conclusion of the street car trip, the guests were taken in automobiles to the Miami-Biltmore Country Club in Coral Gables and were entertained by Mr. Merrick at luncheon.



Cars at Coral Gables on First Run

C. D. Benson, city attorney, acted as toastmaster. Many speeches were made laudatory of Mr. Merrick.

Mayor Rumph of Miami presented Mayor Edward E. Dammers of Coral Gables with a key to the city of Miami.

A 5-cent fare is to be charged every person who rides in the Coral Gables trolleys to the city limits and another fare of 5 cents will be added for all persons who go beyond the city limits, making the fare to Coral Gables from Miami 10 cents.

The City Commissioners at Miami have approved an agreement between the Coral Gables Utilities Company, which owns the railway from Miami city limits to Coral Gables, and the Miami Beach Railway, which has contracted with the Coral Gables Utilities company to operate over this track.

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Recent Bus Developments

Indianapolis Street Railway Files Petition Under New Bus Regulation —Projects Reported from Many Quarters

PLANS of the Indianapolis Street Railway, Indianapolis, Ind., for an extension of bus operation as an integral part of its transportation system has become known with the filing of the company's petition before the Indiana Public Service Commission for a certificate of convenience and necessity under the new bus regulatory laws. Three lines radiating from Monument Circle in the center of the city and a feeder extension of the West Washington Street line are described in the petition. Fares will be the same as on the street cars, 7 cents in cash for a single fare, or 6¼ cents at the ticket rate, with 1-cent transfer and the privilege of transfer free from bus to bus or from bus to street car.

Two lines will run to the north side, the heart of the best residence district, and the traction company will start a campaign for leaving the family automobile at home, in view of strict parking rules in the downtown district. The company now is operating two bus feeder lines on the north side, one of which will be absorbed in the through service by the proposed north side line.

The Connecticut Company, Bridgeport, Conn., has been authorized by the Public Utilities Commission to operate east end, west end and north end crosstown bus lines in Bridgeport. Several independent bus companies had sought licenses to operate through the same sections. They were sponsored by Walter Lasher, president of the American Chain Company. He favored the 5-cent fare the buses would provide. The decision recently handed down by the commission has put an end to the controversy, and the railway will provide the service at the existing fare of three tokens for 25 cents, including transfers. J. B. Potter, manager, when approached recently, said the service would start on May 17. He expects nine new coaches to afford ample service for the present. In refusing the rival applications the commission brought out that without exception the independent bus lines sought to bring their routes through the center of the city. This would have duplicated the service provided by the railway.

City officials of Seattle, Wash., will meet in conference at an early date to study bus transportation as an adjunct to the electric railway system. This conference was decided on when the City Council utilities committee considered an application of Superintendent D. W. Henderson of the Seattle Municipal Railway for two additional buses. The city now operates fourteen buses, purchased at various times, singly and in twos and threes, and the Council believes the time has come for a comprehensive study of the matter of bus transportation. The two new buses to be purchased immediately will be used on the Empire Way line. There is now a petition before the City Council for municipal bus service to replace privately operated buses along Tenth Avenue Northeast and vicinity.

The St. Louis Bus Company, a subsidiary of the United Railways, St. Louis, Mo., has put into effect reduced fares for children, making the rate 6 cents for children under 12 years of age and no fare for those under 5 years and not occupying seats. The rate for adults is 10 cents. The rates of the United Railways on street cars are: Children under 12, 3 cents; adults, 7 cents. The St. Louis Bus Company and the United Railways interchange transfers.

Mayor Neal of Oswego, N. Y., recently authorized the Empire State Railroad to operate buses in Oswego. In approving the majority resolution following a conference with T. C. Cherry, vice-president and general manager of the corporation, Mayor Neal said that the company agreed to meet the cost of certain improvements and in addition promised to improve and extend the service. Mr. Cherry said that although the company was operating at a loss money was being expended for betterments. The Mayor said that he found the company willing to meet the city half way.

Bus operation was discontinued in Goldsboro, N. C., recently, following 30 days of running on a fifteen-minute schedule. H. G. Bales, operator of the line, claimed that the machines did not take in enough to pay for gasoline. He said that he would exchange the buses for vehicles suitable for intercity transportation. The railway in Goldsboro abandoned service some time ago on account of lack of patronage.

The Tri-City Railway, Davenport, Iowa, has suggested abandonment of its track on East Thirteenth Street and substitution of a bus system over the route, connecting with its other lines and operated on the same schedule. It is the first suggestion in the tri-cities of replacement of an electric railway route by buses.

The Windsor, Essex & Lake Shore Rapid Railway started a bus service on April 6 between Windsor and Leamington, Ont., a distance of 37 miles. The line is being operated as the Highway Motor Coach Line, with two Gotfredson sedan type twenty-passenger buses. The independent lines have since discontinued operation. The fares on the buses average 2¾ cents a mile, the same as on the street cars. Tickets are interchangeable.

The Illinois Commerce Commission has refused the Koenig bus line a rehearing for a permit to operate between Joliet and Forest Park. The commission several weeks ago ordered the line to suspend, at the same time granting the Chicago & Joliet Transportation Company, a subsidiary of the Chicago & Joliet Electric Railway, Joliet, Ill., a permit for the service. The Chicago & Joliet line, in addition to furnshing this service, issues transfers to its other city lines from the Forest Park route.

The Public Utilities Commission of the District of Columbia has authorized the Washington Railway & Electric Company to discontinue, temporarily, its through railway service between Massachusetts and Western Avenues and the downtown section during the paving and relocation of tracks on Wisconsin Avenue. The company has been authorized to operate a bus route between 45th and Fessenden Streets and Dupont Circle.

The California Railroad Commission has authorized the Los Angeles Railway to operate bus service along Florence Avenue from the city of Los Angeles to Huntington Park as an extension of railway service. The application of J. B. Simpson for a certificate to operate passenger buses between Huntington Park and Los Angeles, via Florence Avenue, has been denied by the Railroad Commission.

The Olean, Bradford & Salamanca Railway was recently authorized by the City Council of Salamanca, N. Y., to transfer the bus franchise which it was granted a few weeks ago to the Olean, Bradford & Salamanca Bus Lines, a subsidiary company, subject to the terms and conditions of the franchise. In authorizing transfer of the franchise Alderman Fuller's resolution specified that the new company was to be given an additional fifteen days, from the date of the transfer, in which to make application to the Public Service Commission for permission to run the buses, and was to put them into operation within 30 days after receiving such permission.

Sale of seven buses by the United Bus Transportation Company, operating between Elizabeth and Kenilworth, N. J., to the Public Service Transportation Company, a subsidiary of the Public Service Railway, was approved recently by the Board of Public Utility Commissioners. The board extended the purchaser the right to operate the buses over the same route. The Public Service Transportation Company also was granted permission to operate five buses on an extension of the Passaic-Garfield-Lodi route to Hackensack by way of Rochelle Park and Maywood.

The franchise for the new bus lines of the Portland Electric Power Company, Portland, Ore., has been sent to the City Council for approval, following a thorough survey of the territory by city and railway officials.

The Maryland Public Service Commission has received an application from the Blue Ridge Transportation Company, a subsidiary of the Potomac Public Service Company, for permission to operate a bus line from Westminster to Frederick, via New Windsor, Union Bridge, Libertytown and Mount Pleasant. The commission has set May 22 as the date for a hearing.

The Columbus Electric & Power Company, Columbus, Ga., plans to substitute bus service for the railway on the Rose Hill line and in Wynnton. Ten additional buses similar to the three now in operation on the Talbot Avenue line are expected within about 90 days.

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The Boston & Maine Railroad has received the consent of the New Hampshire Public Service Commission to operate buses in Portsmouth as a substitute for the street cars of the Portsmouth Electric Railway, a Boston & Maine line.

Justice Wagner of the New York Supreme Court handed down a decision on May 11 in the cases wherein William J. Schieffelin of the Citizens' Union and Stewart Browne, as taxpayer, had obtained temporary injunctions restraining the city of New York from using municipal funds for the operation of buses in alleged violation of the law. Justice Wagner denied the motions of the plaintiffs to make the temporary injunctions permanent and granted the motion of the city to dismiss the two suits. From this decision an appeal will no doubt be taken to the Appellate Division of the Supreme Court, and after that, if necessary, to the Court of Appeals. The action in which the temporary restraining order was obtained on Jan. 20 last was directed against the appropriation of $164,000 for the 86th Street crosstown line. Justice Wagner held that the appropriation was constitutional under the home rule act.

Rumors have been revived concerning the transfer of the property of the Rapid Transit Company, Richmond, Va., to New York interests who now own some of its stock. It is said these interests will turn the property over to the Virginia Railway & Power Company to be operated in conjunction with its lines and with its proposed bus extensions now before the City Council of Richmond. The price is reported to be the sum invested in the concern, with 6 per cent interest. The amount involved is estimated at $200,000. Hearing on the proposed bus extensions by the railway has been held by the streets committee of the City Council.

Another Philadelphia Fare Hearing in June

Hearings were resumed on April 29 in the rate case of the Philadelphia Rapid Transit Company, Philadelphia, Pa., before the Public Service Commission, but at the close of the day the case was adjourned until the latter part of June. Argument was resumed after a petition had been filed by the United Business Men's Association looking toward restoration of the former fare of 6¼ cents. A rate of two rides for 15 cents was authorized last September by the commission. City Solicitor Gaffney said he would not be ready before the end of June to present the city's case because the Council had delayed the appropriation to meet the expense of further investigation. Only a few days before the hearing on April 29 did the finance committee approve the ordinance appropriating $40,000 to engage experts to examine the railway's accounts. Mr. Gaffney had asked for $75,000. There was a previous balance of $12,000 available for the work.

The only witness called was W. K. Myers, vice-president in charge of finance for the railway. He said that a return to the old fare would cut the company's income to $9,736,000, a sum inadequate for annual fixed charges.

Sioux Scale Unchanged

Members of the union and the Sioux City Service Company, Sioux City, Iowa, have agreed on the wage scale to be paid for the present. As a result there will be no change from the wage scale of 56 cents an hour.

Only one difficulty remains to be settled. The union men demand a twelve months contract. The company is willing to agree to pay the present scale as long as it is possible for it to do so, but declines to sign up for twelve months. The company said:

> Owing to the steady decrease in the number of riders the company finds itself unable to sign up for a definite length of time. We wish to continue the present scale as long as it is possible to do so, and will pay it for the entire year, if we can. Every unnecessary expense has been eliminated so there is little saving to expect from this angle. We feel that we should not cut service to the public in order to reduce operating expenses. Revenue is decreasing at a rate faster than ever before, and we cannot sign up for a twelve-month period when we do not know what the year will bring.

News Notes

Entertain Retiring Chief.—More than 300 employees of the Utah Light & Traction Company, most of whom were platform men, entertained in honor of H. F. Dicke, retiring general manager, at the carhouse in Salt Lake City, Utah, on April 29. The speakers paid glowing tributes to Mr. Dicke and expressed their regret at his departure, also assuring the co-operation of the men with Edward A. West, Mr. Dicke's successor. The employees presented to Mr. Dicke several valuable gifts.

Ten-Cent Rate Sought.—Abolishment of its 50-cent-a-month identification card system and substitution of a straight 10-cent fare with three tickets for a quarter, will be sought of the Illinois Commerce Commission by the Tri-City Railway. R. B. McDonald, general manager of the People's Power Company in Moline, Ill., indicated this move at a recent meeting of the Moline Council. The Tri-City Railway hopes to establish the same scale in Rock Island, Moline, East Moline and Silvis by July 1.

Eight-Cent Fare Extended. — The Missouri Public Service Commission on May 12 extended the present 8-cent fare base in Kansas City for a period of six months. The order was made on application of Receivers F. M. Wilson and Fred W. Fleming and the city through counsel agreed to six months extension of existing rates. Under the commission's previous order the schedule would have expired May 18. No definite period for the extension was named by the receivers in their petition to the commission. A letter from City Counselor Sollon T. Gilmore of Kansas City accompanied the application and stated that the city waived a hearing on the application and offered no objection to the extension of the existing rate of fares. However, the city asked that the extension be for not more than six months.

Seeks Relief from Paving Expenses.—The application of the Sherbrooke Railway & Power Company, Sherbrooke, Que., to the Quebec Public Service Commission for relief from excessive paving expenses in the city of Sherbrooke was heard on April 17 and the hearing was adjourned to May 20 at Montreal.

Will Vote on Transfer.—The City Council of Brandon, Man., recently passed a by-law to transfer the Brandon Municipal Railway to the Canada Gas & Electric Corporation for $50,000, subject to ratification by the ratepayers on May 19.

Franchise Agreement Reached.—The City Council of Quebec, Canada, and the Quebec Power Company have reached an agreement in the matter of a franchise for an electric railway held by the Quebec Railway, Light & Power Company. The new agreement is to run for 30 years from July 1. It provides for the use of one-man cars, the present rate of fare, school children's tickets, workmen's tickets and a revision of fares every 10 years. The city is to give the company preference in the construction of subways or elevated railways or the use of buses. The matter had been under discussion for about a year, but it was not until March 19 that negotiations reached the stage to permit a tentative contract to be drawn.

Franchise Question Up.—The renewal of the franchise of the Niagara, St. Catharines & Toronto Railway will be before the City Council of St. Catharines, Ont., within a few weeks. The company, in return for improvements to track and service, is seeking a twenty-year franchise.

More One-Man Cars in Springfield.—Under the new schedules of the Springfield Street Railway, Springfield, Mass., effective May 10, one-man car service replaced two-man car service on most of the city lines during the greater part of the day. On a number of routes two-man service will be in force during rush hours only. The plan calls for the operation of only fifteen two-man cars all day on city lines.

New Cars Inspected. — The Grand Rapids Railway, Grand Rapids, Mich., recently parked its three test coaches, the Minnesota, St. Louis and Ohio, on a downtown siding. Hundreds passed through the cars and the points of difference and the advantages were explained by attendants. By way of contrast, one of the ancient horse cars and an equally ancient horse also were exhibited. In addition the story of the three new cars was broadcast from Schenectady and Detroit. The Schenectady broadcasting was amplified from a building adjacent to the siding so that the public might further learn about the new cars. The cars have been placed in regular service and now are on the various railway lines, tests being made on all to determine operating costs and efficiency of operation. The Minnesota was described in the ELECTRIC RAILWAY JOURNAL, issue of March 28, page 529.

Men Reject Compromise Offer.—Members of the Peoria carmen's union have rejected a 2-cent compromise wage increase submitted by the Illinois Power & Light Corporation to its demand for a 10-cent increase. Henry Mansfield, for the union, and Eugene E. Soules, for the company, are acting as mediators to effect a new scale.

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Financial and Corporate

Earnings Keep Up

Newport News Company Reports a Surplus in 1924 After Depreciation Reserve of $49,793

Operating revenues of the Newport News & Hampton Railway, Gas & Electric Company, Newport News, Va., for the year 1924 were $1,987,214, a decrease of $112,833 over the earnings for 1923. The operating expenses of the company were $1,223,313, a decrease of $113,342 over the expenses for 1923. Taxes for the year were $123,653, or $2,090 more than the previous year, due to an increase in the federal income tax. Non-operating revenues for the year were $3,561, an increase of $362 over the year 1923. Income reductions were $248,515, or $5,672 less than in 1923.

After all charges the balance available for depreciation, dividends and surplus was $395,293. This is an increase of $4,453 over the year 1923.

SUMMARY OF OPERATIONS OF THE NEWPORT NEWS & HAMPTON RAILWAY GAS & ELECTRIC COMPANY FOR TWELVE MONTHS ENDED DEC. 31

Gross Earnings:	1924	1923
Transportation	$505,836	$541,277
Gas, lighting and heating	336,014	346,908
Electric light and power	766,868	794,193
Ice, coal and wood	378,496	417,670
Total, earnings	$1,987,214	$2,100,048
Operating expenses:		
Transportation	$382,129	$424,614
Gas, lighting and heating	197,372	215,654
Electric light and power	320,642	354,507
Ice, coal and wood	323,170	341,881
Total expenses	$1,223,313	$1,336,656
Net earnings	$763,900	$763,391
Taxes	123,653	121,562
Income less operating expenses and taxes	$640,247	$641,828
Non-operating revenue	3,562	3,199
Gross income	$643,809	$645,027
Income deductions	248,515	254,187
Net income	$395,293	$390,840
Dividends declared during year	245,000	245,000
	$150,293	$145,840
Amount set aside for depreciation reserve	100,500	100,000
Corporate surplus	$49,793	$45,840

J. N. Shannahan, president, explains that the decrease in gross earnings was due to the continued inactivity in business, caused by the reaction from war conditions and the reorganization of important business factors of the community necessary to meet the changed conditions. Mr. Shannahan points out, however, that the decrease in operating expenses more than offset the decrease in revenue. While part of this reduction was brought about by lower cost of fuel, the greater part of the saving was effected by careful elimination of small items of expense without lowering the standard of maintenance.

Recognizing the fact that bus operation is a necessary adjunct to the street railway, in November of 1924 the company purchased the entire capital stock of the Citizens' Rapid Transit Corporation, which operated five buses in Newport News in competition with the railway. This operation is being continued as a part of the transportation system and it is planned later to replace the present bus equipment with the standard railway type of bus.

Four quarterly dividends of 1¾ per cent were paid on the preferred stock of the company and four quarterly dividends of 1¼ per cent were paid on the common stock of the company.

The management feels that the business outlook in the territory served is better than it has been for the past three years.

The statement of improvements and betterments shows that $55,033 was spent on the railway properties. This total included $13,350 for five Reo buses, $37,659 for two steel barges and $2,801 for equipping six cars with safety car control.

Tentative Price Fixed for Rainier Valley Property

The Seattle & Rainier Valley Railway has submitted to the city of Seattle the sum of $1,500,000 as a tentative price for purchase of the line by the city. The offer provides that payment be made by the city in twenty-year bonds bearing 5 per cent interest. This price carries with it no pledge that the company need accept, the sum merely representing the amount President Brown decided to recommend to the company's bondholders in the East, with whom the final power to accept reposes. The sum named is nearly $500,000 higher than the value of $1,045,547 shown by the appraisal of city officials. The figure suggested by Mr. Brown corresponds to the valuation of $1,507,470 as of Dec. 31, 1922, placed on the properties by the State Department of Public Works. This value did not include stores and non-operating property. At the suggestion of the City Council, Mr. Brown has agreed to ascertain whether his company will accept 30-year bonds instead of bonds drawn to mature in twenty years.

Kansas City Bondholders Act

Representatives of the Holders of the First Mortgage Securities Seek an Order of Sale—Second Mortgage Holders and Mr. Armour Remain Unplacated

AN ORDER was submitted on May 11 for the sale of the Kansas City Railways, Kansas City, Mo., under foreclosure. At the same time it was revealed by the holders of the first mortgage that it was not their purpose to include a reorganization scheme in the decree of foreclosure.

The decree was submitted to Judge Kimbrough Stone, referee. As submitted, it omits the mention of the minimum price above which the property must be sold and leaves the date of the sale to the master, named by Judge Stone. Up to the time that a recess was taken, there had been no discussion of the decree by representatives of J. Ogden Armour or of the second mortgage bondholders, none of whom is said to agree with the present plans of the reorganization managers.

H. R. Platt, attorney for the first mortgage bondholders, has been credited with the statement that he understands that a plan for reorganization, which has been "largely agreed upon," is in existence, but no such plan has yet been advanced openly. In the opening discussion Mr. Platt intimated that it would be the policy of his constituents to submit a reorganization plan for the approval of the court at the time the sale shall come up for final sanction. That may be several months from now.

A valuation of the railway now under way will not be finished until Aug. 1, according to the most recent estimates.

It is said that the $2,000,000 claim of J. Ogden Armour and the claims of the second mortgage bondholders constitute the cause for the careful procedure at the hearing by the trustees of the first mortgage. The holders of the second mortgage bonds are reported to have had the opportunity some time ago to settle their accounts for 20 cents on the dollar, but refused the offer. So far as is known, Mr. Armour has never received any definite offer of adjustment of his claim.

According to Mr. Platt, the railway could not now be sold for the amount of its bonded indebtedness. He argued that neither Mr. Armour nor the second mortgage bondholders had any real interest in any minimum sale price which the court might set, because, with deferred interest, $33,500,000 is now due on the first mortgage.

The 1924 earnings of the railway are said to have been $1,057,000. Mr. Platt designated this as a 3 per cent gross return from a $33,500,000 investment, disregarding depreciation and franchise obligation costs.

Appearances would indicate that it was the purpose of Mr. Platt, in attempting to eliminate the second mortgage holders, to restrict these holders as much as possible. In explaining the language of the draft of the decree, Mr. Platt said that in the interest of peace and harmony, it became necessary to consult a large number of lawyers, many of whom had insisted upon rewriting paragraphs to conform to their own prejudices in the matter of diction. He admitted that so far as the phraseology went the resulting decree was rather inelegant.

The hearing appeared to indicate that those on the inside of the railway's affairs do not expect an immediate termination of the receivership.

Although Mr. Holt, attorney for Mr. Armour, is not known to have said anything at the hearing which might indicate that his client has any intention of appealing from any decisions of the present receivership, he showed particular interest in the matter of the rec-

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ords of the hearing. The city clerk having withdrawn the franchise document after he gave his testimony, Mr. Holt was successful in indicating clearly that a franchise of this kind exists between the city and the railway.

Many other matters were taken up during the opening session. This allowed only enough time for the statement of Mr. Platt. Mr. Armour was ordered to be paid $102,931 as a refund on money which he had advanced for surety bonds early in the receivership.

City May Take Phoenix Railway

The City Commission at Phoenix, Ariz., and the State Corporation Commission are considering plans under which Phoenix may continue service by street car in the event of expected abandonment by the Phoenix Railway in October. All bus applications will probably be held in abeyance. One plan, stated by City Manager L. B. Hitchcock, is for the city to purchase the trackage and rolling stock. Thereafter, while maintaining service, efforts would be made to find a purchaser or operator. Special mention was made of the necessity for operation of the three main lines, with possibility that sections of the city not reached by them economically could be served by bus lines. Included in the changes may be any increase in the fare from 5 cents to 8 or even 10 cents.

Refinancing Talk at Binghamton

Negotiations are pending between representatives of the Binghamton Railway, Binghamton, N. Y., and financiers in Binghamton and New York for the reorganization and refinancing of the company. This announcement followed the passing of interest due on May 1 on bonds of the railway. The plan of reorganization will probably be made public upon the return of Mortimer B. Fuller, president of the International Salt Company, from Europe. An official statement says in part:

The Binghamton Railway failed to pay the interest on consolidated 5 per cent bonds due on May 1. The principal of the bonds, aggregating $600,000, will become due and payable on June 1, but no definite provision has as yet been made for the payment of this principal or for the extension of the loan. The company has been obliged to pay large sums for paving expenses and gross earnings taxes, which are long past due, and has been called upon to meet other extraordinary expenditures.

While the 7-cent fare recently granted has improved the financial condition of the company, the maturity of these bond issues and the necessity for large expenditures, among them the purchase of additional cars, make necessary the immediate refinancing of the company on a sound and permanent basis which will provide for these securities and enable the company to take care of its current obligations and give it a reasonable amount of working capital.

It is said that the refinancing will be along two distinct channels. One plan presupposes the willingness of Mortimer B. Fuller to shift his holdings of stock to other hands, in which event the new owner would carry on the proposed refinancing by taking up the principal of $600,000 payable on June 1 and also pay the interest due on these bonds May 1. The other plan would contemplate financing under the direction of Mr. Fuller that would look toward the payment of the principal and interest. Of the many rumors that have grown out of the discussion of the affairs of the company one is to the effect that the road may be placed under the direction of the J. G. White Management Corporation, New York.

Unregulated Jitney Competition Decreases Traffic in Atlanta

After payment of operating expenses, taxes, rentals and interest the balance from 1924 operations of the Georgia Railway & Power Company, Atlanta, Ga., was $2,474,728 and after the payment of sinking funds, $2,211,471.

The total mileage of street railway tracks (on a single-track basis), on Dec. 31, 1924, owned or leased and controlled and operated by this company, exclusive of the street railway system at Gainesville, Ga., which was sold in July, 1924, to the Gainesville Railway, was 245 miles.

The number of passengers carried on the city and suburban system, on the Stone Mountain line and on the Atlanta Northern Railway, which is the interurban line between Atlanta and Marietta, for each of the last four calendar years is shown herewith.

The decreases in passengers carried on the city and suburban system and on the Atlanta Northern Railway in 1924 as compared to 1923 were due to unregulated jitney and bus competition in the city of Atlanta and between Atlanta and Marietta, paralleling the Atlanta Northern Railway. In the latter part of January, 1925, the city of Marietta, served by the Atlanta Northern Railway, adopted an ordinance eliminating the duplication by bus of the service furnished by that line.

At a meeting of the General Council of the city of Atlanta on Feb. 2, 1925, an ordinance was adopted prohibiting the operation of jitneys and buses on streets where street cars are operated. With this ordinance enforced the number of passengers carried for 1925 should show an increase over 1924.

For track and roadway improvements the Georgia Railway & Power Company spent $2,443 during the year.

For the purpose of constructing and acquiring new and additional property or reimbursing the treasury for new and additional property already acquired, there were issued during the year $2,919,000 par value Georgia Railway & Power Company first and refunding mortgage bonds. The bonds so issued, together with 81 bonds held in the treasury, or a total of $3,000,000 first and refunding mortgage bonds, were deposited with the trustee under the general mortgage and there were issued against the same $3,000,000 30-year 6 per cent general mortgage gold bonds, series 1924. The $3,000,000 general mortgage bonds so issued were sold and $2,122,000 of the proceeds deposited with the trustee under the first and refunding mortgage to cover future construction and the balance placed in the treasury.

As authorized by the stockholders at a special meeting on July 29, 1924, the company issued and sold at par $2,500,000 first preferred cumulative stock, 7 per cent, series 1924, the proceeds of which were placed in the treasury of the company to be used or applied only for the acquisition or construction of new and additional property or reimbursing the company for expenditures made for new and additional property.

President of Market Street Railway Ready to Sell

Mason B. Starring, president of the Market Street Railway, San Francisco, Cal., says:

If San Francisco desires to purchase the Market Street Railway at a fair price, and I have too much respect for its integrity to anticipate that it will attempt anything else, the opportunity shall be given it.

As I now understand it, San Francisco seems irrevocably committed to municipal ownership, and I have no desire to run contrary to the wishes of the community.

INCOME STATEMENT OF GEORGIA RAILWAY & POWER COMPANY AND LEASED AND SUBSIDIARY COMPANIES

	1924	1923
Operating revenues	$16,179,766	$16,006,928
Operating expenses	9,813,374	10,195,923
Net operating revenue	$6,366,391	$5,811,005
Less taxes	1,052,292	990,940
	$5,314,099	$4,820,064
Other income	686,483	553,106
Gross income	$6,000,582	$5,373,171
Bond interest and rental dividends of leased and subsidiary companies	1,830,928	1,717,707
	$4,169,653	$3,655,463
Other interest of leased and subsidiary companies	330,029	245,675
Extinguishment ofdiscount on securities of leased and subsidiary companies	12,493	10,603
	$342,523	$256,278
	3,827,130	3,399,184
Bond interest Georgia Railway & Power Company	1,197,085	892,176
	$2,630,045	$2,507,008
Interest on notes Georgia Railway & Power Company	102,546	37,392
Extinguishment of discount on securities Georgia Railway & Power Company	52,770	33,377
	$155,316	$70,769
Net income for the year before depreciation and dividends	$2,474,728	$2,436,238

STATEMENT OF PASSENGERS CARRIED

	1921	1922	1923	1924
City and suburban system	91,358,479	92,172,664	9›,357,117	92,029,437
Stone Mountain line	672,741	557,274	634,014	640,634
Atlanta Northern	1,178,852	1,131,278	1,218,697	1,202,985

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Valuation Hearing Begun at Baltimore

A hearing to determine the valuation of the property of the United Railways & Electric Company, Baltimore, Md., opened before the Maryland Public Service Commission on May 4. It continued for four days and then was adjourned to be resumed on May 13. The case opened with arguments by William H. Maltbie, representing the company, and Clarence W. Miles, counsel for the people. The first witnesses were called for the United.

During the course of the hearing C. D. Emmons, president of the United, made a statement to the effect that the company is not planning to ask an increased fare at present. Mr. Emmons said:

> The company has no idea at the present time of claiming an increased fare. For some years past it has been perfectly well known to the officers of the company and to its board of directors that the company was not earning a fair and legal return upon the value of its property, but at no time has court action been suggested to obtain this return.
>
> We have our interests in the city of Baltimore, just as every one else here has, and it has been our earnest desire to keep the fare down to the lowest possible point based on good service. We see nothing to suggest a change in this policy unless unexpected circumstances arise or demands come upon us from quarters over which we have no control; such incidents as a change in the purchasing power of the dollar, increased demands from the tax collector or other items of a substantial nature which must be taken directly out of the car fare.
>
> The company is running on too low a return on its value, but we look to the future growth of the city rather than to a present increase in the car fare for our reward.

Excellent Showing Made in Schenectady

The most favorable report in many years was filed with the Public Service Commission by the Schenectady Railway, Schenectady, N. Y., for the first quarter of 1925. The net loss for the first quarter of 1924 was turned into a net profit this year. While the operating revenue remains about the same the operating expenses have been reduced by nearly $93,000. The statement follows:

	1924	1925
Operating revenue	$469,943	$467,664
Operating expenses	441,210	348,541
Net revenue	$28,734	$119,123
Tax	28,026	25,354
Operating income	$708	$92,369
Non-operating income	516	590
Gross income	$1,224	$93,959
Fixed charges	47,825	57,712
Net corporate income	$46,601*	$36,247

*Loss.

Commonwealth Power-Tennessee Electric Merger Proposed

G. E. Hardy, president of the Commonwealth Power Corporation, states that the directors have authorized the submission of the plan for acquisition of control of the Tennessee Electric Power Company, Chattanooga, Tenn., operating several electric railways, by exchange of stocks, under which on consummation the second preferred stock of the Tennessee company will receive preferred stock of the Commonwealth Corporation on the basis of share for share and the common stock of the Tennessee company will receive for each share 35/100 of a share of preferred stock and 25/100 of a share of common stock of the Commonwealth corporation.

Mr. Hardy further states that holders of substantial amounts of the Tennessee stocks have already agreed to exchange under the plan. The proposal is now in process of preparation and a statement of all the details will undoubtedly be issued in the near future.

Issue of Mortgage Bonds Approved.—The Public Service Commission has authorized the Savannah Electric & Power Company, Savannah, Ga., to issue $1,200,000 of first and refunding mortgage bonds to reimburse the treasurer for expenditures to the physical property.

Bond Issue for Improvements.—The Dayton, Covington & Piqua Traction Company, Dayton, Ohio, is arranging a bond issue of $100,000, the proceeds of which are to be used to rehabilitate the tracks and line and the rolling stock.

Dissolution Final.—Final order of dissolution of the Aurora, Plainfield & Joliet Railroad, Joliet, Ill., has been issued by the Secretary of State. The railway ceased operations last August and established a bus service over the route under the name of the Aurora, Plainfield & Joliet Transportation Company. The abandonment order was issued last July, but the commission retained jurisdiction over the road to enable Joliet and Plainfield municipalities to collect their paving assessments. The company was formed in 1901. Financial difficulties began with a tragedy near Joliet that resulted in damage awards which forced a receivership. The western division was sold by the master to the bondholders, who attempted rehabilitation. The Joliet-Chicago Heights line was junked.

Deficit Lower.—For the three months ended March 31, 1925, the operating revenue of the International Railway, Buffalo, N. Y., was $2,568,482, against $2,599,338 for a similar period of 1924. Operating expenses and taxes fell from $2,412,380 in 1924 to $2,308,261 for the three months period of the present year. After allowing for income deductions a deficit of $115,144 remained for this year's period, against a deficit of $196,721 for the first three months of last year.

P. R. T. Calls Notes.—The Philadelphia Rapid Transit Company, Philadelphia, Pa., has called for redemption on June 1 its two-year 6 per cent gold notes at 100¼ and accrued interest.

City May Take Railway.—Mayor Kendrick of Philadelphia, Pa., has sent a communication to Council in which he pointed out the advantages of ownership of the Frankford, Tacony & Holmesburg Railway. Hamilton Disston and Henry J. Rebman, the receivers, have expressed the opinion that at the receiver's sale, June 15, the bondholders' protective committee would agree to an upset figure of $350,000 if the city bids for the property. The Mayor has suggested that it might be more economical to purchase the line than to construct a new line, as originally contemplated. The Mayor showed that the cost of rehabilitating the railroad would be about $450,000. Informally, he said, the Philadelphia Rapid Transit management had expressed its willingness to operate the line if so desired by the city.

Rutland Road Sold.—The Burlington Paper Stock Company has completed negotiations for purchase of rails, wires and equipment of the Rutland Railway, Light & Power Company, Rutland, Vt., for $18,000. The purchasers are to junk the property. The Rutland Railway Light & Power Company abandoned the lines late in December, 1924. Rutland is a city of 15,000. The railway operated 30 miles of track.

Council Sanctions Abandonment Appeal.—A resolution of the Bowling Green Council has been filed with the Public Utilities Commission recommending approval of the application of the Toledo, Fostoria & Findlay Railway, Fostoria, Ohio, for permission to discontinue service between Bowling Green and Pemberville. Abandonment of the line is sought so that the tracks may be removed from East Wooster Street, Bowling Green and the streets paved.

Reorganized Company Does Well.—The New York Railways, New York City, which recently emerged from a six-year receivership, earned $1,322,092 in the nine months ended March 31 applicable to charges. This compares with $585,076 in the nine months of the preceding year. Gross income declined, however, from $6,733,977 last year to $6,036,186 for the nine months ended March 31, 1925. Operating expenses and taxes for the nine months were $5,063,857, compared with $6,598,171. Operating income was $972,329 against $135,806. Gross revenues in March were $663,915, compared with $736,260 a year ago; operating expenses and taxes $559,194, against $726,473; operating income $104,721, against $9,787, and income before charges $134,568, against $49,165. The nine months' results show interest requirements for the entire year totaling $1,005,500 on $19,353,000 underlying mortgages of the reorganized company covered by an ample margin, and indicate earnings for the fiscal year ending next June 30 above 4 per cent on the $19,435,472 of new income bonds.

Discontinuance Authorized. — The Indiana Public Service Commission has granted a petition of the Union Traction Company for permission to discontinue interurban service between Anderson and Middletown. The company was instructed to file a separate application for permission to establish a bus route to take the place of the traction line.

Ninth Avenue Holders Agree.—Under a plan of reorganization agreed to by the protective committee representing the first mortgage 5 per cent, bonds of the Columbus & Ninth Avenue Railroad, New York, each bondholder will receive, upon final adoption of the plan, $416.66 principal amount of income bonds and 2½ shares of preferred stock of the New York Railways Corporation for each $1,000 bond deposited.

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Personal Items

D. A. Belden Heads Holding Company

David A. Belden has been elected chairman of the board of the Community Power & Light Company, St. Louis, Mo., which owns and controls various lighting, power, gas, water and artificial ice properties in Missouri, Kansas, Texas and Arkansas.

Mr. Belden is widely known in the electric railway and the central station fields. From 1894 to 1901 he was general manager of the Aurora Street Railway, Aurora, Ill., and other traction lines in that vicinity. He next became general manager of the Georgia Railway & Electric Company, Atlanta, but left there in 1903 to become general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala. In 1905 he was elected president of the New Hampshire Electric Railways and subsidiary companies, including traction and lighting properties in the Haverhill, Mass., and Portsmouth, N. H., territory. Mr. Belden was born in Aurora in 1868. He was educated at Racine College in Wisconsin.

Mr. Belden was president of the Massachusetts Street Railway Association in 1915-17 and was a member of the special commission appointed in 1919 to investigate Massachusetts traction conditions.

Jilson J. Coleman Promoted

Jilson J. Coleman, manager of the Scranton Railway, Scranton, Pa., for the past five years, has been promoted to the position of operating vice-president. He will continue his duties as general manager. This was announced by the directors of the General Engineering & Management Corporation of the A. E. Fitkin interests in New York, recent purchasers of the Scranton Railway.

Mr. Coleman started railway work in Louisville, Ky., in 1882 as a clerk with the Central Passenger Railway. He worked his way up to the position of chief clerk and then managed the lines in New Albany, Ind. Later he moved to Cleveland and became identified with Tom L. Johnson and assisted in electrifying the horse-car lines. After that work was completed, Mr. Coleman helped to build the line from Allentown to South Bethlehem and from Allentown to Catasauqua. The company at Allentown purchased the line from Allentown to Bethlehem and consolidated the two companies. He was engaged in the work of rehabilitating the Yonkers system and in 1895 started the Nassau Electric Railroad, Brooklyn, N. Y., now included in the Brooklyn-Manhattan Transit Corporation. He managed the consolidation of the St. Louis and Washington systems for Brown Brothers, New York bankers. He next built the line of the New Jersey & Pennsylvania Traction Company, between Trenton and Princeton. From 1918 to 1920 Mr. Coleman was district engineer of the Passenger Transportation Division of the United States Shipping Board, Emergency Fleet Corporation, under A. Merrit Taylor, former transit commissioner of Philadelphia. This position carried with it the responsibility of seeing that adequate transportation was provided for the ship builders in the territory extending from Boston, Mass., to Houston, Tex.

New Key System Superintendent of Equipment

W. P. Jackson has been appointed superintendent of equipment of the Key System Transit Company, Oakland, Cal., in charge of all mechanical matters, with jurisdiction over the maintenance of rolling stock and floating equipment, reporting to the chief engineer. He succeeds George St. Pierre, who has retired after 39 years of service.

W. P. Jackson

Mr. Jackson joined the forces of the San Francisco-Oakland Terminal Railways in 1906 as assistant master mechanic. In 1914 he became master mechanic and now becomes superintendent of equipment of the successor company, the Key System Transit.

Mr. Jackson was born in Marion, Ind. At the age of seventeen he started to work as an apprentice with the Columbus Railway, Columbus, Ohio. He served with that company in the armature room, machine shop, foundry, truck room and car winding department. He then became general superintendent of the Marion Street Railway, Marion, Ohio. There he remained for six years.

After leaving Marion he became division superintendent of the Union Traction Company at Anderson, Ind., holding this place for one year. Later he was general superintendent of the Bay City Traction & Electric Company in Michigan and master mechanic for the Saginaw Valley Traction Company. Three years later he returned to Marion as master mechanic.

Mr. Alberger Resumes His Duties

W. R. Alberger has once more assumed his duties as vice-president of the Key System Transit Company, Oakland, Cal., after an extended trip of observation in the East and the Middle West.

During his trip Mr. Alberger made a study of the bus problem for his company and also made a survey of the fare situation. In speaking of the recent changes in personnel in his company Mr. Alberger explained:

> We have simply put young men on the firing line, where they belong, and older men, like myself, have been given easier berths. It is a good policy.
>
> I am still an official in the Key System Transit Company and expect to continue indefinitely in my present capacity.

R. C. Havens has resigned as manager of the Grand Rapids Safety Council to become safety manager of the Grand Rapids Railway, Grand Rapids, Mich.

J. E. Hill has been made general manager of the Eastern New Jersey Power Company and its subsidiaries, the Coast Cities Railway and the Atlantic Coast Transportation Company. He has had wide experience in the electrical field. A little more than a year ago Mr. Hill was made manager of the Monmouth Lighting Company, with headquarters in Keyport, N. J.

M. S. Casey of the St. Louis office of the Illinois Traction System has been assigned to the Decatur, Ill., district as district passenger agent to take over the work of developing the system's traffic. This work has been done by Lloyd C. Bundy, in addition to his other duties. The action has established Decatur as a district office for the company.

Albert B. Hoffman has been elected a vice-president of the Security Trust Company, Detroit, Mich. The Security Trust Company is one of the receivers of the Detroit United Railway, and Mr. Hoffman is the officer of the trust company most actively interested in representing the interests of the receiver in the railway.

John W. McCardle, serving his third term as a member of the Indiana Public Service Commission, has been elected chairman of the commission to succeed Samuel B. Artman, chairman last year. Mr. McCardle was appointed under Gov. James P. Goodrich. He became vice-chairman and was reappointed by Gov. Warren T. McCray. On May 1, 1921, when he began his second term, he was elected chairman to succeed Ernest I. Lewis. He continued as chairman until the election of Mr. Artman. Mr. McCardle was formerly a member of the Indiana Board of Tax Commissioners.

George St. Pierre, connected with the local railways at Oakland, Cal., for 39 years, and for many years superintendent of equipment for the Key System Transit Company, has retired from active service with the company. Mr. St. Pierre is from Montreal, where he served his apprenticeship as marine machinist. He began work with the traction company in Oakland in April, 1886. To show their appreciation of him, the employees of the Key System gave a banquet in his honor. Representatives from all departments were

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present. James P. Potter, superintendent of transportation, was toastmaster for the evening. The employees presented to Mr. St. Pierre a set of diamond cuff links as a token of esteem. He will retire to his farm near Walnut Creek.

Aubrey Beattie, an engineer on the staff of the Cape Breton Electric Company, Sydney, N. S., has been transferred to Beaumont, Tex., where he will be assistant superintendent of the Eastern Texas Electric Company. Both the Cape Breton Electric Company and the Eastern Texas Electric Company are directed by Stone & Webster. Mr. Beattie is a native of Amherst, N. S., and was attached to the staff of the Cape Breton Electric Company for 2½ years. He was graduated from the Nova Scotia Technical College and the McClellan School of Applied Science at Sackville, N. B.

Ralph Peters has resigned as superintendent of the Long Island Railroad to become an assistant vice-president of the Corn Exchange Bank. Mr. Peters entered the service of the road in 1910. On Oct. 1 of that year he was made assistant engineer in the construction department. Following a series of promotions he was made superintendent on July 1, 1923.

E. B. Kessler will succeed Ralph Peters as president of the Long Island Railroad. He became identified with the Long Island as general yardmaster on April 16, 1907, and became an assistant superintendent on July 1, 1923.

A. W. Koehler has resigned as director of safety of the New York State Railways, Rochester, N. Y., to accept a position as superintendent of accident prevention of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., effective on June 1. Mr. Koehler has an extended and successful experience in safety work. For two years previous to joining the staff of the State Railways he was executive secretary of the Rochester Safety Council, which is affiliated with the National Safety Council. During the previous five years, with the exception of a period of war service in the engineering department of the Navy, he was engaged in safety work with the Commonwealth Steel Company, Granite City, Ill., and the Atlantic Steel Company, Atlanta, Ga. Mr. Koehler was graduated in mechanical engineering from Purdue University in 1915. He was editor of the New York State Railways Magazine called "Transportation." His successor at Rochester has not yet been announced.

John H. Truett, safety director and chairman of the safety committee of the United Railways & Electric Company, Baltimore, since July, 1919, relinquished these duties recently and accepted the position of director of the Baltimore Safety Council.

William F. Hanna, secretary of the safety committee of the United Railways & Electric Company, Baltimore, Md., since its formation in July, 1919, has been appointed safety director of the company to succeed John H. Truett.

Clyde H. Jones has succeeded Maurice Douglas as a member of the Indiana Public Service Commission.

Obituary

Milan R. Bump

Milan R. Bump, chief engineer for Henry L. Doherty & Company, New York, and former president of the National Electric Light Association, died on May 5 at Denver, Col.

From 1910 to 1915 Mr. Bump was engaged largely in examining for purchase and improving many of the public utility properties which now make up the subsidiaries of the Cities Service Company. He had charge of all engineering and of the construction and operating departments of the public utility division, later becoming a member of the executive committee of the Doherty organization and assuming charge of oil transportation, the refining and marketing divisions and the natural-gas division, in addition to the engineering and technical activities of the organization. He was an officer, a director or both of many properties.

In 1915 Mr. Bump interrupted his service with the Doherty organization and became vice-president of the Eagle-Picher Lead Company in Joplin, but he soon returned, largely on account of missing the close associations and friendships he had formed.

In 1904 Mr. Bump became associated with Henry L. Doherty as the first cadet engineer of the Doherty training schools. From 1904 to 1906 he was engineer for the gas department of the Denver Gas & Electric Light Company, one of the first Doherty properties; from 1907 to 1909 he was examining engineer for Henry L. Doherty & Company, and in the latter year he removed to Joplin, Mo., where he was instrumental in consolidating electric utilities of the lead and zinc district and forming the Empire District Electric Company, of which he became treasurer and general manager. He also designed and erected a large modern steam plant and an extensive transmission system covering the entire mining field. In 1910 Mr. Bump was transferred to New York as chief engineer of all the Doherty interests.

Mr. Bump was born at Rock Falls, Wis., March 18, 1881. His boyhood was passed in Spokane, Wash., where he received his early education in the public schools. He entered the University of Wisconsin in the fall of 1898 and was graduated with a degree of B.S. in electrical engineering in 1902. He immediately entered upon engineering work with the Washington Water Power Company, but in 1903 pursued his engineering studies and served for one year as an instructor in electrical engineering at the University of Wisconsin.

John H. Turner, district superintendent for the United Railways, St. Louis, Mo., for many years, died recently. He was the first man to take out a car during the strike of 1900 and the premier "gripman" of the days when cable cars were the vogue in St. Louis. He entered railway work in Chicago as a cable car operator. When St. Louis discarded horse cars in 1887 for the cable system he went to St. Louis as an instructor in cable car operation.

August Kruesi, former engineer of construction of the General Electric Company, died at El Paso, Tex., on May 7. Mr. Kruesi was with the British Thomson-Houston Company in London from 1898 until 1900. During the next two years he worked on electrical machine design for the General Electric Company at Schenectady. From 1902 to 1906 he was engaged in the commercial development of the Curtis steam turbine, and from then until 1908 was in the railway engineering department, working on power house and substation design. Mr. Kruesi was made head of the construction engineering department when it was established in 1908.

John Kerr, a pioneer in tramway construction in Great Britain, died recently. Mr. Kerr was for a long time managing director of Dick, Kerr & Company, Ltd. When cable traction was successfully developed in the United States a company called the Patent Cable Corporation was formed in England to exploit the system there, and in this Mr. Kerr was much interested. Several cable tramways were installed in Britain, notably the one in Edinburgh, and as a rule Dick, Kerr & Company were the contractors for the construction. As a separate company it also worked the Edinburgh cable tramways (now electrified). Mr. Kerr was also associated in the work of constructing various electric tramways, and his company went into the manufacture at Preston of electric traction machinery. Of late years Mr. Kerr was retired and the name of his company disappeared on its being amalgamated with other electrical manufacturing companies under the name of the English Electric Company, Ltd. He was 73 years old.

W. H. Bickle, chief motor inspector of the Louisville Railway, Louisville, Ky., died April 22. He suffered a stroke of apoplexy on Sept. 11 last and has been failing ever since. Mr. Bickle was born in Plymouth, England, on August 5, 1864. He came to America in 1880 and shortly afterward went to Louisville and was given a job with the old Central Passenger Railway, building crossings in the way department. Later he helped to install the motors on the first electrically operated cars in Louisville.

Hollis B. Rogers, builder and operator of one of the first electric railways in the country, died at his home in Brockton recently. Mr. Rogers started a line 1½ miles long in Brockton, Mass., known as the Brockton Street Railway. Other lines were extended to Whitman and thence to Randolph. Finally these lines, growing with the years, became part of the present Eastern Massachusetts Street Railway. Mr. Rogers was born in Wrentham, Mass., on June 14, 1841. He went to Brockton when a young man and started a stage line shortly after settling there. He was president of the Brockton Street Railway and after the consolidation vice-president and general manager of the Old Colony line. During the Civil War he was a lieutenant in the 20th Rhode Island Cavalry. He was a member of the New England Street Railway Club.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Many Bus Builders Bid on Kansas City Order

An avalanche of bus bids, with detailed specifications, has showered upon the receivers of the Kansas City Railways, Kansas City, Mo., as a result of the recent decision to buy 61 vehicles. As a consequence the receivers are busily engaged in making their final examination of the bids. Although the receivers are said to have tentatively decided the make of bus to be used previous to the opening of the bids, they recently asked for formal bids.

The bids were opened on May 9, but the matter of final choice is still under consideration. According to rumors, the delayed decision is due to the fact that the receivers wish to consider the various propositions in company with Judge Kimbrough Stone to assure there be no further delay in awarding the order.

The buses on which bids were asked include 40 single-deck, sixteen double-deck vehicles and five parlor cars.

One of the company's carhouses which has been leased for some time for use as a garage will be used to house the initial bus equipment until a permanent garage can be arranged.

Great Northern Awards Locomotive Order

Tangible evidence is afforded that the recent rumors were correct that additional electrification of the Great Northern Railroad was in prospect. The railway has now closed a contract with the Westinghouse Electric & Manufacturing Company for four electric locomotives and other equipment, to be used for the railroad's Cascade Mountain grade electrification. This stretch will extend from Skykomish at sea level through the Cascade tunnel to the summit. The electrification will cost $1,000,000. It will be undertaken immediately and is planned for completion within twelve months.

According to F. H. Shepard, director of heavy traction of the Westinghouse company, the electric locomotives will be an innovation in transportation. They will utilize direct-current motors operated from a single-phase, high-voltage alternating-current trolley. In this respect they will follow the principle announced by Henry Ford for the electric locomotive now building for his railroad.

Financial considerations have of course prevented the immediate electrification of many miles of railroads, but, as Mr. Shepard sees it, this situation is constantly improving owing to the more intelligent appreciation of our transportation problem on the part of the public and the decrease in tendency to hamper railroad progress by means of witless restrictive legislation.

As for the electrification itself, it calls for the extension of the present line through the Cascade tunnel and snowshed to a point west of the tunnel. The Great Northern is now operating three electric locomotives from a point east of the tunnel to a point part way through.

Electric Locomotives for Virginian Railway Demonstrated

Demonstrations were given on the afternoon of May 14 on the special test track at Pitcairn, Pa., of the first of the new single-phase electric locomotives built by Westinghouse for the Virginian Railway. Three 200-ton units, comprising one complete locomotive, were operated at normal speeds of 14 and 28 miles. Regeneration was demonstrated by having the electric locomotive pushed by a powerful Pennsylvania freight locomotive. For this purpose only one cab of three was in the circuit, but the steam locomotive was heavily taxed to move the electric. Other similar units in process of manufacture at the Westinghouse plant were inspected in the shops before the demonstration was staged.

The locomotive is the first completed of twelve ordered by the Virginian Railway for its $15,000,000 electrification project between Mullens, W. Va., and Roanoke, Va., described previously in the ELECTRIC RAILWAY JOURNAL.

Impregnated Paper Cables of American Manufacture

The Okonite Company, New York City, announces the formation of the Okonite-Callender Cable Company, Inc., to offer to the electrical industry in the United States impregnated paper cables made by the secret processes and under the patents of Callender's Cable & Construction Company, Ltd., London, England.

The installation of machinery under the supervision of Callender's engineers in the new plant at Paterson, N. J., is nearing completion and it will be ready for production July 1. This plant will combine the latest and best practices of this country and Europe. In it specially designed Callender machinery will be installed. It will also contain a completely equipped electrical research laboratory, which will work in conjunction with Callender's research laboratory. As the company sees it this will enable it to render an increasingly important service to customers in assisting them to solve their wire and cable problems.

In this connection it is of interest to note that Sir Thomas Octavius Callender, known through the electrical industry in Great Britain as "Sir Tom," will soon visit the United States for a short time. He has traveled widely in Europe, North Africa, India and the East. Sir Tom has been associated with the British electrical industry from its very commencement and, especially in regard to high-tension distribution, has been one of the pioneers and leaders. In 1873 he entered his father's office in London, the business then being in connection with the asphalt paving of streets. Experiments carried out by himself and his brothers led to the

ELECTRIC RAILWAY MATERIAL PRICES—MAY 12, 1925

Metals—New York

Copper, electrolytic, cents per lb.	13.60
Lead, cents per lb.	7.80
Nickel, cents per lb.	31.00
Zinc, cents per lb.	7.32
Tin, Straits, cents per lb.	54.50
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.25
Somerset mine run, Boston	2.075
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.875
Kansas screenings, Kansas City	2.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2.95
Tie plates (flat type), cents per lb.	2.375
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.50

Hardware—Pittsburgh

Wire nails, base per keg	2.75
Sheet iron (28 gage), cents per lb.	3.20
Sheet iron, galvanized (28 gage), cents per lb.	4.30
Galvanized barbed wire, cents per lb.	3.45
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.09
White lead (100 lb. keg), cents per lb.	0.1575
Turpentine (bbl. lots), per gal.	1.10
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	15.875
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	17.75

Paving Materials

Paving stone, granite, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	....
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.86
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1.75
Sand, cu.yd., N. Y.	1.00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.125
Light copper, cents per lb.	9.375
Heavy brass, cents per lb.	6.50
Zinc, old scrap, cents per lb.	4.125
Lead, cents per lb. (heavy)	6.875
Steel car axles, Chicago, net ton	$17.25
Cast iron car wheels, Chicago, gross ton	16.25
Rails (short), Chicago, gross ton	17.75
Rails, (relaying), Chicago, gross ton	25.50
Machine turnings, Chicago, gross ton	8.75

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discovery of the insulating product known as vulcanized bitumen. This product was patented in 1881.

In 1882 a company was formed to manufacture insulated wires and cables and generally develop vulcanized bitumen as an insulator, and during the next few years a large proportion of the early underground mains in London and the provinces were manufactured and laid down by the Callender company. The development of the electrical industry, with the consequent increase in the demand for underground mains, rendered it necessary to reorganize the original business, and in 1898 the present company, Callender's Cable & Construction Company, Ltd., was formed to take over the old Callender company.

Sir Tom is now and has been for many years past the managing director of Callender's Cable & Construction Company, Ltd., and is on the board of a number of subsidiary companies formed by that company. In addition, he is a director of several of the great power companies of Great Britain.

Government's Foreign Trade Policy Defined

Charles Evans Hughes declared before 700 members of the Chamber of Commerce of the State of New York on April 28 that the fundamental policies of the government make for peace, and that friendly trade and commerce with all the world have been made possible by governmental co-operation with business in foreign relations.

Taking up a remark once made by Mr. Choate that commerce in the future would be the real pacifier, Mr. Hughes said he had "a preference for two-named paper," and declared that "commercial promises of peace go better with the indorsement of sound governmental policies." The speaker then mentioned the struggle for raw materials, for places in the sun, and said that "unless this economic urge is controlled by reasonable men the securities of peace for which we look in the activities of commerce are not worth as much as often they are thought to be." Among other things Mr. Hughes said:

> I am glad to think that the more fundamental policies of our own government make for peace—not because we are a nation of pacifists, that is an illusion, because our form of organization, our method of political action, our national disposition, favors the processes of reason. I know there are some who think that our government does not espouse with sufficient ardor the cause of business expansion abroad, that it is a mistake to withhold desired assurances of support when American interests seek opportunities in other lands, and other governments are held up to us as patterns of the sort of governmental enterprise and backing which would assure success in a world competition. I think that this is a short-sighted view.
>
> It should be enough to point out that under our system it would be a mistake for the executive branch of the government to offer assurances which it could not make good; to give to other countries an impression of interference, none the better because more pretended than real; to develop among other peoples the suspicion and lack of confidence which such a policy inevitably produces.
>
> Our policy rests on the conviction that given an equal opportunity abroad, fair and equal dealing, American business men can take care of themselves. It is because of this policy that American capital is welcomed in many countries needing development. Our government does not play favorites among American business men, and it seeks for all, and I think I may say with increasing success, the open door of opportunity. I believe that the government has the strong support of business organizations in maintaining this intelligent restraint. It is a restraint not as generally recognized as it should be.

Rolling Stock

Fort Dodge, Des Moines & Southern Railroad, Boone, Ia., through its subsidiary, the Fort Dodge Line Transportation Company, ordered three passenger coaches seating 21 for operation between Iowa State College and Ames. Delivery is expected by June 1.

Indianapolis Street Railway, Indianapolis, Ind., has placed tentative orders for twenty new buses in the event that the commission will grant the company's new bus petition. The new investment, referred to elsewhere in this issue, amounts to about $250,000.

Marion & Bluffton Traction Company, Bluffton, Ind., through its officials recently made a trial trip of one of the new one-man type of interurban cars recently purchased. The new car is about 45 ft. long. The Public Service Commission has authorized the company to issue $32,000 of 7 per cent equipment notes to finance purchase of two new interurban cars.

Track and Line

Kansas City Railways, Kansas City, Mo., has been authorized by Judge Kimbrough Stone to build new tracks on Thirty-first Street, Benton Boulevard to Indiana Avenue and on Brooklyn Avenue from Eighteenth Street to the north end of the Kansas City Terminal Viaduct.

Grand Rapids Railway, Grand Rapids, Mich., has started work on reconstruction of its tracks and repaving in Wealthy Street from Division Avenue to Eureka Avenue. This will represent an approximate expense of $122,840. More than a mile, or to be exact, 5,700 ft., of new double track and paving will be laid by the company.

San Francisco, Cal.—The Bureau of Engineering of the San Francisco Department of Public Works is making surveys for the proposed extension of the Municipal Railway into the Excelsior district. The unit will be an extension of the Potrero Avenue line.

Portland Electric Company, Portland, Ore., plans the expenditure of $3,000,000 in 1925 for improvements, extensions and betterments. Of this a little more than $1,000,000 will be used for the railway department in both city and interurban improvements.

Power Houses, Shops and Buildings

Boston Elevated Railway, Boston, Mass., is having plans prepared for a garage at Malden.

Salt Lake & Utah Railroad, Salt Lake City, Utah, suffered the loss by fire of its automatic electric substation at Curtis, Utah, a station 3 miles north of Provo, on April 28. The loss is estimated at about $50,000.

Trade Notes

Archer & Baldwin, Inc., New York, N. Y., well-known dealers in used steam and electrical power equipment, are moving their offices from 114 Liberty Street, New York City, to Bound Brook, N. J., where they have for a number of years had a warehouse. This change is made to facilitate shipments, to permit constant supervision of rebuilding operations and, through direct contact with stock, to make immediate reply to all inquiries.

Roller-Smith Company, 233 Broadway, New York, N. Y., announces the appointment of the Detweiler-Bell Company, 101 Milk Street, Boston, Mass., and 152 Temple Street, New Haven, Conn., as its representative in the New England States. The personnel of the Detweiler-Bell Company consists of Paul G. Detweiler, in charge of the New Haven office, and R. H. McCormick, in charge of the Boston office. The Detweiler-Bell Company succeeds Walter W. Gaskill, who has been representing the Roller-Smith Company in the New England territory for several years in the sale of electrical measuring instruments and circuit breakers.

The White Company, Cleveland, Ohio, announces the removal of the Eastern region office of Martin A. O'Mara, vice-president, and also the New York office of the export department from 61 Broadway to Room 2630, Whitehall Building, 17 Battery Place.

New Advertising Literature

Chase Companies, Inc., Waterbury, Conn., not long ago entertained a guest, F. G. Cooper, whose frankly frivolous cartoons have been a feature of *Life* for longer than he himself might care to admit. The results of Mr. Cooper's visit have been appearing in some of the trade journals and have attracted so much friendly interest and amusement that the Chase Companies decided to publish them in permanent form.

Fageol Motors Company, Oakland, Cal., has issued its revised instruction book with suggestions for keeping coaches "in top earning condition as many days in the year as possible." The book contains 75 pages and an index.

American Manganese Steel Company, Chicago Heights, Ill., is sending to its prospective customers a circular which contains a list of practically all of the applications of manganese steel so far developed and a tabloid exposition of the character and peculiarities of manganese steel. The company is also distributing a copy of the little magazine, published monthly by the Machinery Club of Chicago, called *Chatter*, on page 8 of which is an article describing operations at Chicago Heights in the manufacture of Amsco manganese steel castings. The company is now producing manganese steel in six plants by the electric furnace process. The company is a member of a group of industries controlled by the American Brake Shoe & Foundry Company.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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MORRIS BUCK, *Managing Editor*

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Modernization of Railway System Wins Public Approval in Pittsburgh

IN SHARP contrast to the oft-repeated philosophy that "it's never been done before, and it can't be done now," is the attitude of the management of the Pittsburgh Railways. Satisfaction with things as they have always been, that insurmountable barrier to progress, is conspicuous by its absence. The present feeling is exactly the opposite. Methods that have been in effect for a long time are critically examined to see if changing conditions have not rendered them obsolete. Any plan which gives reasonable promise of improving the service is tried, no matter how greatly it differs from established practice.

As a result of this attitude on the part of the management, many changes have been made during the past year. A description of the more important improvements made since the reorganization of the company is given elsewhere in this issue. It is not expected that all of the changes will turn out to be 100 per cent successful, but it is already evident that many of them are accomplishing remarkable results.

Of greatest importance, perhaps, is the realization by the public that the railway is a going concern, that it is doing things all the time, that day by day it is improving the quality of its transportation service. There is no danger that people in Pittsburgh will consider the street railway a "back number." On the contrary, they must step lively to keep up with the progress of the company.

Public opinion has swung over to the railway. There is general realization that the welfare of the community and the prosperity of its transportation system are bound closely together. The city does its part by liberal treatment of the company, and in return the railway spares no effort to give the best possible service.

Protection of Highway Crossings Is Becoming More Important

CONSTANTLY increasing numbers of automobiles using the public highways make more important than ever before the matter of protecting interurban grade crossings. Time was when a white cross on top of a supporting post was considered sufficient warning to the highway user that he was approaching a railroad crossing. That idea has now been superseded by the belief that it is good business for electric railways to do everything in their power to protect highway crossings and prevent accidents.

A few over-cautious railway men have hesitated to install modern warning signals for fear that in case of signal failure the company might be held more culpable for having installed a device that failed to work than if no protection at all had been provided According to this theory, a single failure might outweigh all the good accomplished by giving warning of danger many thousands of times. In the eyes of certain other railway managements crossing signals are of little value because some motorists flagrantly violate their indications. Here again the occasional failure is deemed of greater importance than the habitual, satisfactory performance.

In reality, however, most highway crossing signals function satisfactorily with extremely infrequent failures. Moreover, a large majority of the drivers of vehicles heed these warnings. This is clearly understood by most of the progressive interurban managements, and important expenditures are being made constantly for this kind of accident prevention. That these companies are spending money in this way is a good indication that crossing protection is well worth while.

Progress Now Being Made in Electrification of Railroads

RAILROAD electrification is once more making headway in the United States. This is evidenced by a number of recent events that are significant. One is the decision of the Great Northern Railway to electrify its line across the Cascade Mountains. Another is the successful test of the first electric locomotive for the Virginian Railway, which took place last week. Both of these developments are in line with the decision made some time ago by the leading electrical manufacturers to standardize the type of contact line.

In view of these developments the addresses made at the annual meeting of the American Institute of Electrical Engineers, and reported in this issue, were of special significance. Now that the engineers have decided on a standard for electrification work, the railroad financiers and executives can plan ahead with confidence. They know that other engineers will not come along and upset all the plans by arguing for a different system.

There can be little argument but that the system agreed on—a single-phase contact line at high voltage—is a very happy solution of the problem. With its use it has been found possible to employ motors of any desired type, either directly or through suitable conversion apparatus. Thus extreme flexibility of operation is possible on a system which can be adopted as a standard for all future projects, and the equipment will be entirely interchangeable.

Another type of electrification is that of the Long Island Railroad. Inauguration of electric service between Jamaica and Babylon this week was the occasion for rejoicing on the part of the residents. It is noteworthy that real estate promoters have not been slow to bring the advantages of the new service before the public. Undoubtedly they will make much more profit out of the change than will the railway. Nothing could show more conclusively the value of fast and frequent service in building up a community.

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Selling Brooklyn Service to Smokers

NEWSPAPER reading New Yorkers—and that means about everybody—were startled recently by being told that Transit Commissioner Harkness had said he knew of no law against women smoking on the street cars. This remark was only incidental to the main one of his passing favorably on the application of the Brooklyn City Railroad to permit smoking during the summer months in the rear section of the company's new pay-as-you-pass cars, an additional lot of which are now going into service. Of course, the idea of seeing "lovely woman stoop to folly" appealed to the headline writers and to the paragraphers. It was natural that it should. The news reel people also were quick to grasp the significance of the rule as feature stuff. They shot pictures with the co-operation of the railroad and in this way helped to advertise the new cars by showing on the screen passengers of both sexes indulging in the weed.

Conditions have changed considerably since the non-smoking rules were adopted by the former Public Service Commission. Indeed they have. The commissioner went to some length to point this out. Smoking is an old custom, but it has taken on new frills, not the least of which is the Dawes pipe. Still Mr. Harkness did a brave thing in saying that he would be glad to hear from the public, either for or against the measure, so that he might carefully weigh the matter "as a preliminary to any further action." Despite this, no storm of public protest has followed the announcement. The persistent *Pro bono publico,* if he has thought about it at all, has been discreetly silent. Not even Mayor Hylan has protested, but he may have Mr. Hirshfield gumshoeing around to learn whether Mr. Harkness is interested in Schulte or the United Cigar Stores.

One of the lines on which the new cars will run is the Flatbush Avenue route. On it at present there are many open cross-bench cars. Smoking is permitted on the rear seats of these cars. The Flatbush run has a large proportion of short-haul riders. The railroad did not want to lose any of its customers. There is no likelihood that it will now. In fact, the prospects are that the patronage of men will increase on other lines where this type of car has been in use for some time. This is all the company is seeking to achieve. The Brooklyn case is a peculiar one. This is instanced by the fact that the commission did not issue a blanket order. In fact, it made it quite plain that it was out of the question to expect a general extension of the smoking privilege.

Sustained Effort Is Necessary to Achieve Results in Safety Work

SPASMODIC public safety campaigns, more or less evangelistic in their nature, are of little benefit unless they are followed up by sustained effort. Such has been the experience in a number of cities where they have been tried. Unfortunately the spectacular campaigns have not always aroused sufficient general interest to insure the continuation of safety work.

Equally good or better results are more likely to be accomplished by quiet, continuous efforts along safety lines, than by occasional drives, mass meetings, etc. Moreover, certain methods followed by a few of the organizers of the evangelistic type of safety campaign perhaps have antagonized a portion of the public. Gruesome exhibits, grotesque monuments of those killed in accidents, the unfortunate slogan "safety first," these and similar well-meant but ill-advised schemes in some cases may have hampered the progress of the work by alienating public sympathy.

Benefits resulting from systematic safety efforts are so genuine and important that no more forceful argument could be found than the clear presentation of these facts. Steady hammering will eventually drive home the lesson. Electric railways and other utilities have played an important part in this work. But they cannot do it all themselves. Their efforts must be supported by equally systematic endeavors on the part of the public as a whole.

High Buildings— A Menace to City Development

MUCH has been learned within the last few years in regard to means for relieving street congestion, as well as its causes. If it had not been for the automobile, our knowledge of these subjects would not have progressed so rapidly. But the large number of vehicles now using the streets has compelled recognition of a serious situation, which with horse-drawn vehicles might have been longer in coming. But it is certain that it would have come in most large cities even without the automobile.

Recent conferences on city planning have developed some very definite lines of procedure which must be followed if city dwellers are to continue to live comfortably and conduct their business with economy. These principles are wide in scope and include far more than non-parking ordinances. Parking restrictions and other means for securing more efficient use of the streets are like certain medicines listed in the pharmacopœia for reducing fever. They are necessary for immediate relief, but do not entirely remove the cause of the disease. It is the same with street congestion. If unhealthy conditions are allowed to continue, palliatives like parking restrictions are inadequate to occasion a complete cure, according to Harland Bartholomew, speaking before the United States Chamber of Commerce this week.

The real cause for congested streets, of course, is the effort made to obtain from them far more use than that for which they were originally designed, and as in most cases they cannot be widened at a reasonable expense, the only practical remedy is to divert as much traffic as possible to streets which are less congested. Fundamentally, this means decentralization—a spreading out of the city—with many business and civic nuclei or centers, rather than a few. It also means a limitation on the height of buildings or on the average height of buildings within an area so that the demand for transportation by the occupants of these buildings will not exceed the transportation capacity of the streets serving that district. Viewed in this light, the tall building becomes a menace rather than an object of business pride, and the famed "skyline" of some of our cities, like New York, becomes a symptom of civic sickness rather than business health.

The only condition which makes transit possible in the downtown areas of most of our large cities is that all of the ground area there is not developed with tall buildings. If this was so, business would be impracticable. Modern practice in city planning therefore favors decentralization of business and business activity. Fortunately this is a condition also which would simplify the local transportation problems.

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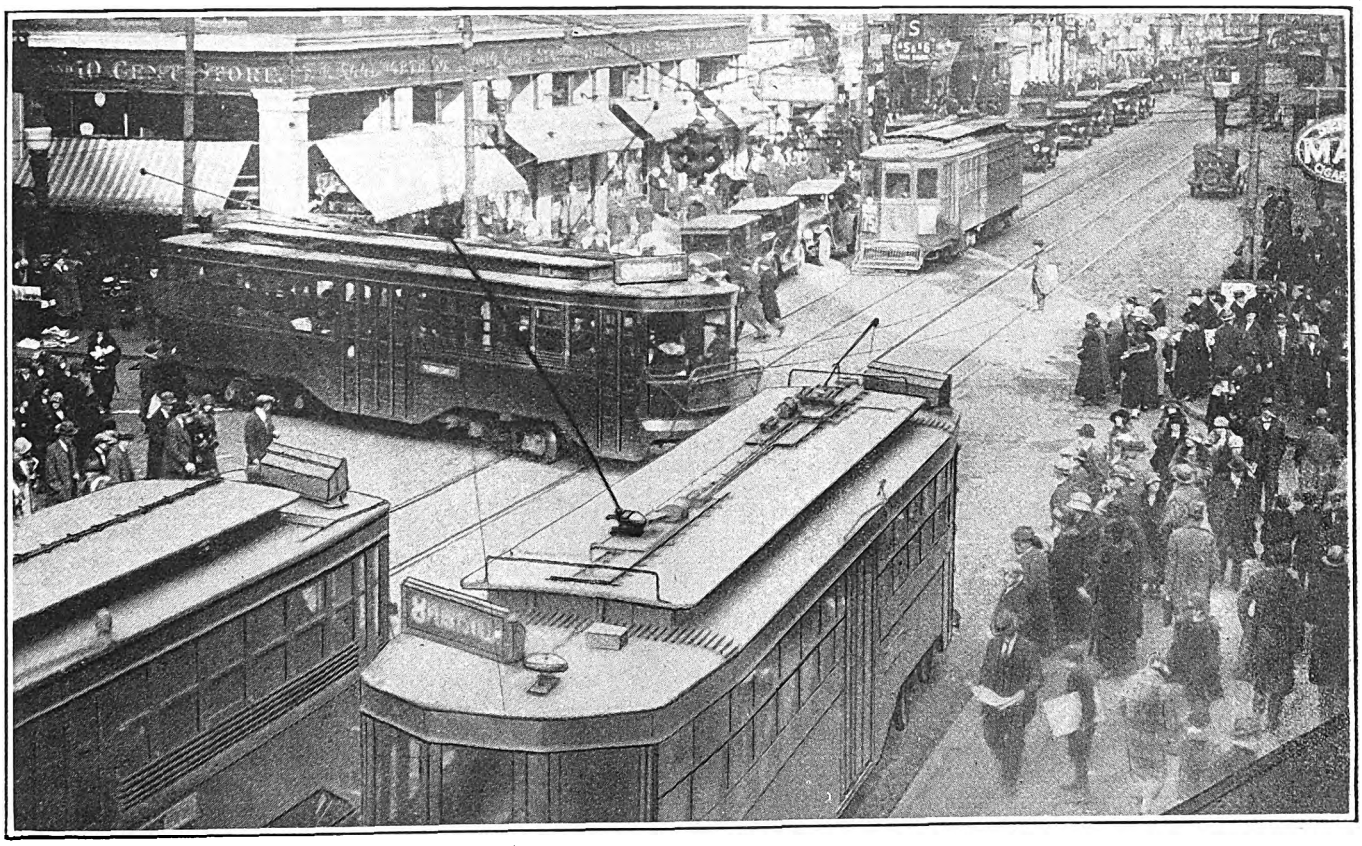
Rehabilitation of Pittsburgh Railways Brings Many Improvements

Since the Reorganization in 1924 the Financial Position of the Company Has Been Strengthened and Much New Equipment Purchased—Public Relations Have Been Improved and Relief from Paving Obligations Has Been Obtained—An Abstract of the Agreement with the City Is Given



Low-Floor Cars with Center and Front Doors Are Now the Standard for City Service on the Pittsburgh Railways

NOTABLE progress has been made in the rehabilitation of the Pittsburgh Railways since the reorganization, slightly more than a year ago. A total of 328 new passenger cars have been ordered, of which about 200 have already been delivered and placed in service. When the work for this year is completed approximately 40 miles of track will have been rebuilt. In addition a considerable amount of new track already has been constructed. Extensive improvements are being made in the shop facilities. In every way the quality of transportation service rendered is much higher than for many years past. This has resulted in improved public relations.

Adoption of a comprehensive agreement with the city is the foundation upon which the rehabilitation has been based. For more than ten years prior to the reorganization of the company there had been a long series of controversies between it and the various municipalities served. Three-quarters of a million dollars was expended in making investigations, reports and valuations. Six general surveys were made of the transportation situation by outside engineers and nineteen separate reports filed.

A crisis was reached in the early part of 1918 and the company was placed in the hands of receivers appointed by the United States court. The receivership lasted for approximately six years. It was generally recognized during this period that in order to provide good transportation service the railway required new cars, additional carhouses, new shop equipment and the renewal of many miles of track. However, it appeared impossible to secure money for such purposes as long as the company remained in the hands of receivers. Many of the yearly payments due the city of Pittsburgh, covering street cleaning, bridge tolls, taxes on poles, wires and gross receipts, were not being made by the receivers. It was therefore the desire both of the city and of the company that the receivership be terminated and the property restored to its owners. This was finally done on Feb. 1, 1924, despite some doubt expressed by the court as to the actual solvency of the company. Before finally discharging the receivers the

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court arranged to continue a certain measure of protection for a period of ten months after the receivership ended.

Termination of the receivership was made possible by the adoption of a somewhat unusual agreement between the railway and the city. Outstanding features of this agreement are:

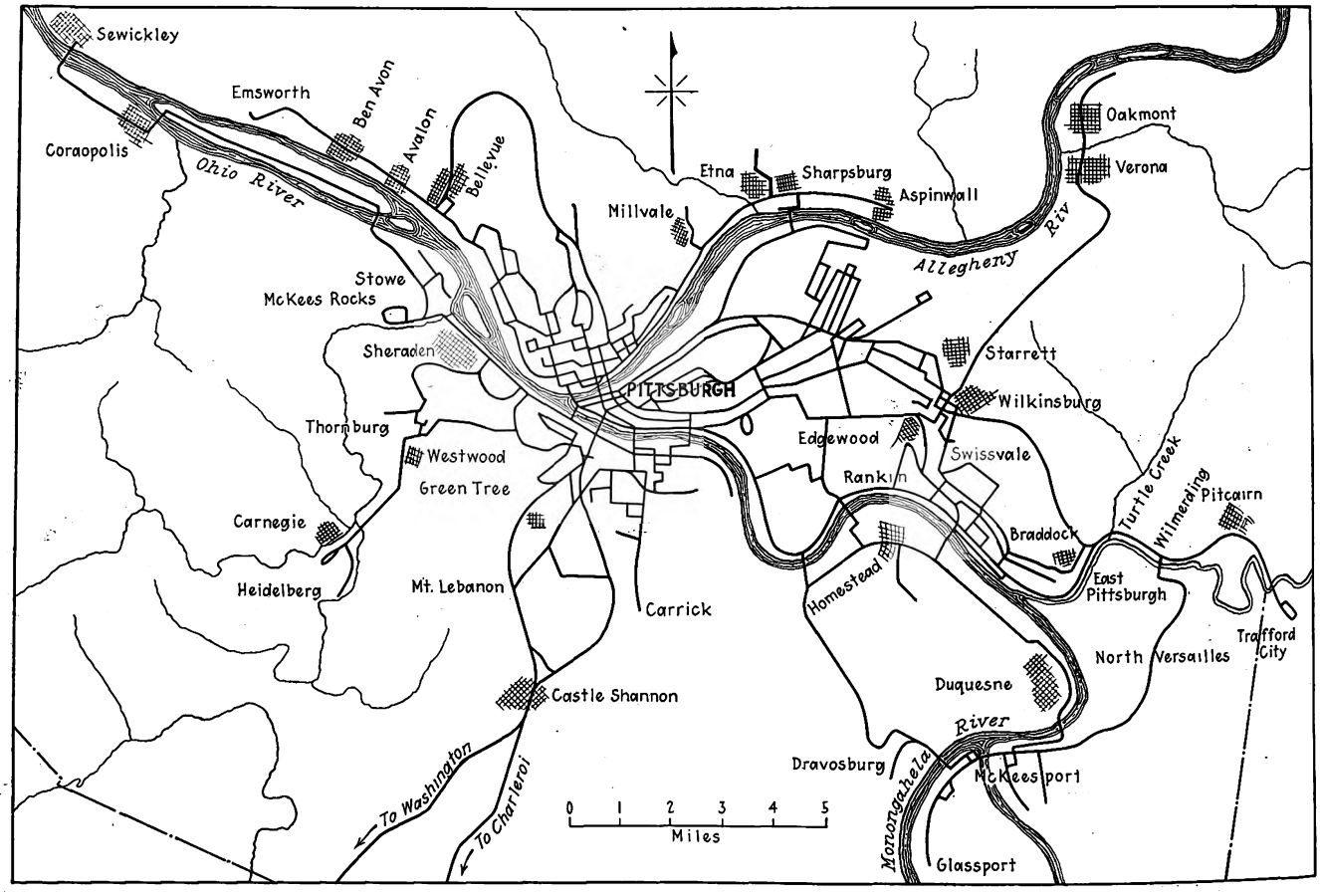
1. Recognition of the $62,500,000 valuation established by the Public Service Commission.

2. Fixing an annual rate of return of 6 per cent on this valuation.

3. Adjustment of fares to provide sufficient revenue to meet the allowed return on the investment after operating expenses, depreciation, taxes, etc., have been paid.

value set at $48,000,000, and the company, which was asking for $78,000,000. Acceptance of a 6 per cent return was in the nature of a concession by the railway because previous decisions in Pennsylvania had established that public utilities are entitled to a return of 7 per cent. After the adoption of the agreement and its approval by the Public Service Commission the valuation cases which were pending in the Superior Court were discontinued.

Acceptance of an annual payment of $100,000 instead of a miscellaneous assortment of fees, tolls, taxes, etc., represented a substantial concession on the part of the city. Even more important was the elimination of paving charges. According to law the railway is required to pave between the tracks and 1 ft. outside



Although Divided Into Many Separate Municipalities the Territory Served by the Pittsburgh Railways Is Practically One Continuous City

4. A blanket payment of $300,000 a year in lieu of previous license fees, paving charges, tolls, taxes, etc., payment to be made only when earned.

5. Establishment of a Traction Conference Board of four members representing the city, the boroughs and the railway.

This agreement also paves the way for some future readjustment of the capital structure to result eventually in one united ownership of all the underlying properties, of which there are more than one hundred. A liability of approximately $8,200,000 was assumed by the company in place of outstanding floating obligations of about $11,000,000, and the various creditors agreed to take one-tenth of their claims per year over a period of ten years without interest.

Establishment of the $62,500,000 valuation of the property fixed by the Public Service Commission was a compromise between the city, which hoped to see the

each outer rail. Under the new agreement, however, the city does all the necessary work of paving and repaving which is not necessitated as a result of track removal, replacement or maintenance. For all such work the company pays $200,000 annually in quarterly installments. It is arranged that in case the track mileage within the city is increased or decreased proportionate changes shall be made in the amount of both payments, which now total $300,000.

Should it happen that for three consecutive months of any year the revenue of the company is not sufficient to pay the allowed return to capital and to meet the budget requirements, and if it appears that this deficit is likely to continue for a further period of at least three months, the city agrees to the suspension of the quarterly payment for licenses, etc., and for paving, or as much of such payment as may be necessary to make up the deficit. In case the deficit still

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exists at the end of the year, all such suspended payments are canceled.

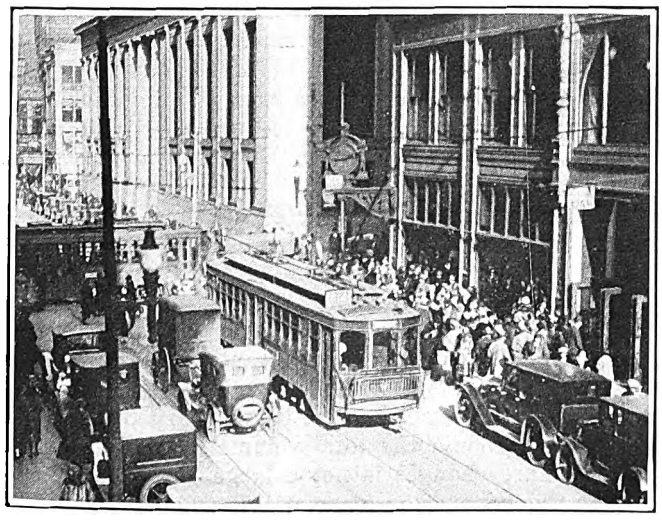
Adjustment of these matters is in the hands of a Traction Conference Board. Creation of this board was one of the important parts of the agreement. It is composed of four members, two appointed by the Mayor of Pittsburgh, one by the joint action of the municipalities other than the city of Pittsburgh signing identical agreements and one selected by the company. All matters coming before this board are decided by a majority vote. In case of a tie, however, the vote of the representative of the company does not count. Each member of the board holds office during the pleasure of the authority responsible for his appointment.

Through the Traction Conference Board the city and the boroughs now have a voice in the amount of money which the railway spends for operation, extensions, betterments, improvements, depreciation allowance and rehabilitation. Thirty days before the end of the fiscal year the company submits a detailed budget for the ensuing year. This is subject to revision by the board. Throughout the year monthly reports are submitted for comparison with the budget figures. At any time the railway may submit a supplementary budget, which is treated in the same way as the original. The expenses of the board, limited to $50,000 a year, are borne by the railway.

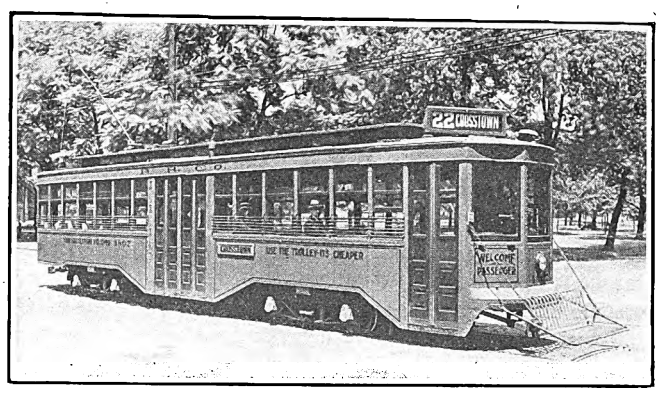
In case either the city or the company is dissatisfied with any action of the Traction Conference Board the question in dispute is submitted to a board of arbitration, composed of three members, one appointed by the Mayor, one chosen by the company and the third chosen by these two. The decision of the arbitration board is final except on matters over which the state Public Service Commission has jurisdiction. In such cases either party has a right of complaint to that body.

Fare Adjusted According to Expenses

At the end of any fiscal year, if there is a surplus in the earnings of the railway over and above the operating expenses and the return to capital, the company turns over the whole of this surplus to the Traction Conference Board. The latter body distributes it to the city of Pittsburgh and other municipalities joining in the plan in proportion to the number of miles of track in each municipality. If, however, the surplus is created by reason of economies in operation,



Narrow Streets and Heavy Traffic Are Serious Transportation Problems in Pittsburgh



The New Spirit of Transportation Service Is Typified by This Car

then the company is entitled to retain one-half of such saving for its own use, with the proviso that the average car fare during the greater portion of the year must have been less than that in effect at the time of the agreement.

In case the surplus at the end of any quarter is of such amount that in the opinion of the Traction Conference Board a reduction in car fare would be justified, then the city or any of the municipalities or the board itself has the right to apply to the Public Service Commission for a reduction. Against this the company agrees to make no objection. On the other hand, if it is necessary at any time to increase the fare in order to meet the approved budget requirements and the accrued accumulative return to capital, the company has the right to file with the Public Service Commission schedules for an increase sufficient to enable it to carry out the requirements, in which case the cities and municipalities agree to make no objection.

Approval by the cities of Pittsburgh, Washington, Pa., and a number of other smaller municipalities has been secured for this new agreement. To a large extent this was made possible because during the preceding several years A. W. Thompson, president of the Philadelphia Company, had gained the confidence of the people of Pittsburgh. He had become the head of that company during the railway receivership and had done much to improve the public relations of the Duquesne Light Company and the Equitable Gas Company, subsidiaries of the Philadelphia Company. For that reason the public was more than willing to have the Pittsburgh Railways taken out of the hands of receivers and restored to operation under the management of the company of which he was the president.

As a condition precedent to the return of the property to private management arrangements were made for $5,000,000 of new financing. As stipulated in the agreement, this was borrowed in the Pittsburgh district. Another step taken to insure local control of the railway was the arrangement that after the reorganization two-thirds of the directors should always be chosen from Pittsburgh or the surrounding municipalities.

During the fifteen months since the ending of the receivership great emphasis has been placed on the matter of improving public relations. Extensive and skillful publicity campaigns have been conducted. Artistic posters, changed weekly, are carried in the cars. Interesting little pamphlets are placed periodically in the "Take-One" boxes. Friendly messages have been conveyed to the public in a variety of ways. The measure of success which has attended these efforts

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may be judged from the sympathetic attitude taken by the public toward the company at the time of the trainmen's strike last summer. Another indication is the recent passage of no-parking ordinances covering practically all downtown trolley streets. How this has improved operating conditions will be told in detail in a future article in this paper.

Behind the idea of improved public relations has been always the idea of giving better service. Immediately after the reorganization orders were placed for 225 new cars. Nearly all of these have been received and placed in service. A number of trail cars have been equipped with two motors each, which has materially increased the speed of these trains on the

Artistic Posters on General Subjects Are Part of the Public Relations Work

many hills in this district. This plan was described in ELECTRIC RAILWAY JOURNAL for June 2, 1923, page 919.

In order better to attract attention to the new cars they are painted traction orange instead of red, the color previously used. Other cars of modern center-door low-floor type have been repainted to match. Older type cars, however, are still painted red and it is planned to retire them from service as soon as possible.

Recently 103 more cars of the same general low-floor design were ordered. Of this number 20 will be used on the interurban lines and the remaining 83 will be one-man, two-man multiple-unit city cars.

Approximately $500,000 is being spent on ten new administration buildings, to be located on property which the company owns in various parts of the district. It is planned to expand the development into modern carhouse structures at these locations. Recreational facilities will be provided in the administration buildings as well as first aid rooms and passenger rooms. The company stresses the point that these shall not be called "waiting rooms."

NEW MACHINERY FOR MANCHESTER SHOPS

- Motor test set
- Bearing boring machine
- Set electric melting pots (babbitt)
- Double-boring lathe for compressors
- Bullard wheel-boring machine
- 2 Electric soldering pots
- 4 Oil-burning blacksmith furnaces
- Large size Bulldozer riveter, 100-ton
- Air hammer
- Automatic electric wheel welding machine
- 2 Emery wheel stands
- 18-in. manufacturing lathe
- Cleveland pinion puller
- Portable band saw for wood or metal
- Wheel-turning lathe, 35 and 5 hp. motors
- Rotary saw, 5 hp.
- Axle lathe, 25-hp. motor
- Shop air compressor, 350 cu.ft.
- 5 Oil tanks with hand pump equipment
- Motor and fan dust-collecting system
- Motors

NEW MACHINERY FOR HOMEWOOD SHOPS

- 1 5-ft. radial drill
- 1 16-in. 8-ft. tool room lathe
- 1 27-in. heavy-duty manufacturing lathe
- 1 Boring machine for bearings
- 1 Hanna riveter, 100-ton
- 1 Metal shears for No. 8 gage x 96-in. sheet
- 1 Axle straightener
- 1 Automatic cut-off machine for bushings
- 1 Bullard boring mill
- 1 Bradley hammer
- 2 High-speed $\frac{9}{16}$-in. drill presses
- 2 Blacksmith oil furnaces
- 1 Hollow chisel mortiser
- 1 Wood-working shaper
- 1 Wood vertical boring machine
- 1 Portable wood or metal band saw

Track rebuilding for the current year will cost nearly a million dollars. At the same time extensions and connections will cost about $200,000 more. This will make possible a number of important changes in routing in the downtown district. An article concerning track reconstruction on the Pittsburgh Railways will be published in a future issue of this paper.

Acquisition of the Manchester plant of the American Locomotive Company has permitted the Pittsburgh Railways to establish a second important car shop alongside its Manchester carhouse. More than $50,000 is being spent to equip this shop. At the same time extensive changes are being made in the older Homewood shops of the company. Much new machinery has been ordered for that purpose. In this plant a change from belt drive to individual motor drive will be made, along with the other improvements. An outline of the new machinery is given in accompanying tables.

More than $300,000 is being spent for improvements to the overhead lines. More feeder capacity is being provided. Extensive signal installations have also been made.

From the standpoint of the public, one of the most important changes that have been made during the past year is in the matter of fare. In all 35 changes have been made. The base fare of 10 cents cash, three tokens for 25 cents, has remained unchanged. Special transfer privileges have been granted in many cases, however. The Sunday pass has proved a successful experiment. A 5-cent fare is being charged in several local areas. While the total volume of traffic affected by these fare changes is not a large part of that carried by the system, the many people who have benefited by them are greatly pleased, and this has been a helpful factor in improving public relations.

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Two New High-Level Island Platforms Connected by Overhead Bridge and Stairways Were Constructed at Babylon Station

Service Started on Babylon Electrification of Long Island Railroad

Two-Track Line from Jamaica to Babylon, L. I., a Distance of 28 Miles, Electrified —Cost Approximately $5,000,000—Six New Substations Were Built, Transmission and Third-Rail Lines Installed and the Station at Babylon Was Reconstructed

FOURTEEN all-steel electric cars made up a jubilee train that started on May 20 from the Pennsylvania Station in New York to mark the official opening of the new Jamaica-Babylon electrification. As passengers the train carried officials of the railroad, invited guests and representatives of the various civic and commuters' associations along the line. It stopped at every station of the Montauk division and was noisily greeted at each of them.

The long red train, lacking the steam locomotive that had long been familiar, looked strangely decapitated to the residents as it drew into each station to take on the local dignitaries bound for the opening ceremonies at Babylon. Many floral pieces were presented as good-will offerings, and thousands of men and women were gathered about the flag-draped stations of every village and town along the route. It seemed almost as if no hand and no house along the way was without its flag. Children flung colored paper streamers in through the windows until the fourteen cars resembled a bridal procession. At Baldwin a squadron of airplanes met the train as an escort and dropped flowers and programs.

At Babylon sirens shrieked to the boom-boom of the aerial bombs, the sharp crack of machine guns and the cheers of residents assembled from all over Long Island. The song "Good-bye Choo-Choos," arranged for this occasion, was popular. Headed by the Sunrise Trail Band, composed of 60 employees of the railroad, the celebrants marched to the athletic field under escort of a cavalry troop from Brooklyn, the local fire and police departments and numerous bodies of boy and girl scouts. Chester O. Ketcham, chairman of the reception committee, read an address of welcome from the village president. Several railway officials replied.

To provide the electric passenger train service between Jamaica and Babylon on the Montauk division of the Long Island Railroad has called for an expenditure of approximately $5,000,000. Authorization to electrify this branch, which includes a two-track line 28 miles long, was given by the board of directors in April, 1924. Work of preparing specifications and plans was begun immediately, and the construction of new substations, transmission lines and distribution systems was started early in June, 1924. Practically all the work has been carried out by the railroad construction forces and has been completed in the remarkably short time of a year. To break in the new equipment, a trial train has been operated since May 5, but service was not inaugurated until last Wednesday.

Six new substations have been built, together with two transformer stations for increasing the transmission line voltage from 11,000 to 33,000. These stations are located at Laurelton, Lynbrook, Freeport, Wantagh,

GROWTH OF COMMUTER TRAFFIC ON ELECTRIFIED DIVISION OF LONG ISLAND RAILROAD BETWEEN 1905 AND 1924

	Number of Commuters 1905	1924	Per Cent of Increase
Rosedale	200	5,601	2,700.5
Cedar Manor	186	4,839	2,501.6
Locust Avenue	43	2,259	5,153.5
Higbie Avenue	41	5,949	14,409.9
Laurelton	41	3,179	7,653.7
Valley Stream	623	13,386	2,048.6
Lynbrook	2,449	20,395	732.8
Jamaica	2,742	35,657	1,200.4
Hollis	1,059	20,046	1,792.9
Queens Village	733	30,740	4,093.7
Hempstead	2,486	15,277	514.5
Long Beach	100	21,397	21,297.0
Bayside	2,027	12,278	505.7
Port Washington	1,179	10,733	810.3
Far Rockaway	4,183	42,740	921.8

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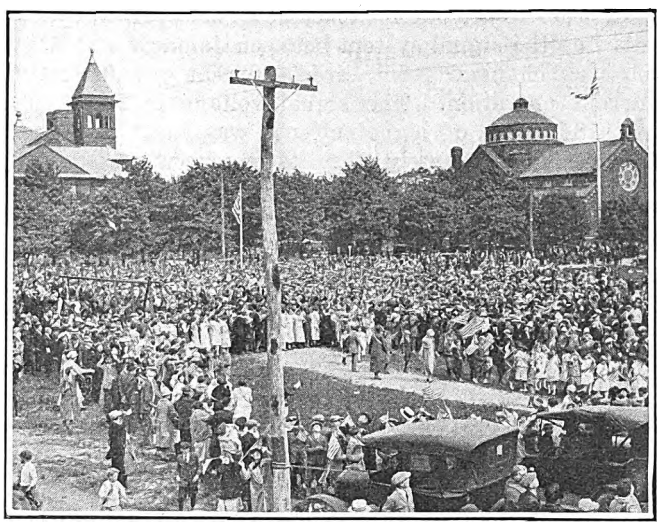
Local Fire Departments Were Assembled at Nearly All Stations Along the Line. This View Is of Rockville Center

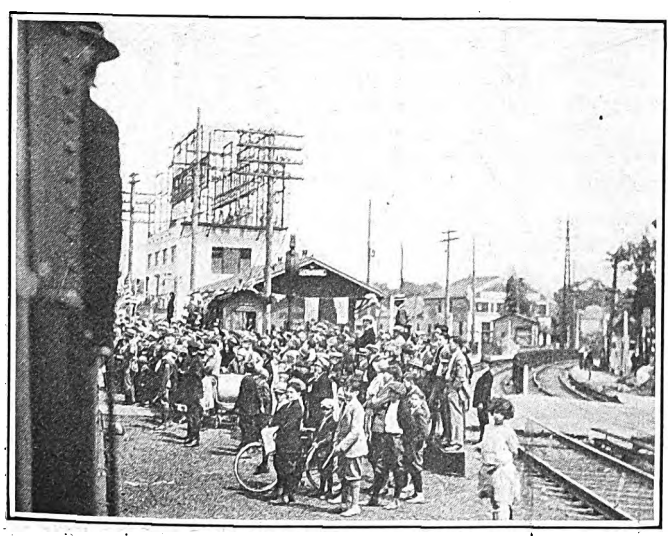


Crowds Gathered at the Athletic Field in Babylon for Jubilee Exercises and Speeches by Prominent Officials

Amityville and Babylon. These substations include the latest practice in design. All high-voltage equipment and connections have been placed outdoors and the stations themselves present an imposing appearance. The substation buildings are reinforced concrete and contain the rotary converters, low-voltage switching equipment, etc. With the exception of the substation at Lynbrook, all have the high-voltage equipment placed on the ground at the side or end of the substations. At Lynbrook, however, space did not permit of this construction, and so the equipment was mounted on the roof of the substation. The total capacity of all converters installed in the six new substations is 20,000 kw. and an additional 2,000-kw. unit has been installed in the Cedarhurst substation. All the major items of electrical equipment were furnished by the Westinghouse Electric & Manufacturing Company, and about 1,000,000 lb. of fabricated steel was furnished by the Pittsburgh Steel Mills for use in the substations and transformer stations.

This electrification required the construction of a new transmission line from Lynbrook to Babylon and the rebuilding of the existing lines from Rockaway Junction to Wreck Lead and from Valley Stream to Lynbrook. More than 18½ miles of new transmission lines have been added to the system, and this construction required 900 wooden poles, 60 steel poles and 130 miles of bare copper wire. To provide additional transmission line capacity between the power house at Long Island City and the Rockaway Junction substation 3.2 miles of underground conduit was constructed between Whitepot Junction and the Dunton arrester house, and two underground cables with a total length of 120,920 ft. were installed. These cables contain three wires for the transmission of 11,000-volt power. The wooden poles used for the construction of the transmission lines came mostly from Idaho, the steel poles from Pittsburgh and the copper for both the overhead and underground transmission systems from Montana.

The third-rail construction follows the standard used by the Long Island Railroad on its other lines, which consists of an over-running third rail with a protecting board. For power transmission 296,000 ft. of third rail and 315,000 ft. of protecting board were used for the new electrification. Other material used in third-rail construction work included 39,500 insulators and brackets for supporting the rail and holding the protecting board in position, 24,000 ft. of conduit and 25,400 ft. of insulated copper cable. Highway crossings are at grade and cable in conduit is necessary for making connections between adjacent ends of third rails at crossings. The third rail weighs 150 lb. per yard and was rolled at the plant of the Bethlehem Steel Company at Steelton, Pa., 13,000,000 lb. being used.



The Lynbrook Substation Formed a Background for the Crowds Assembled to Greet the First Electric Train

Flag-Draped Stations and Buildings Added to the Holiday Spirit of Electrification Day

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In order to provide for efficient signal operation along this line the signal system between Jamaica and Babylon was changed from direct current to alternating current operation. The signal voltage is 2,200 volts and 18½ miles of signal circuit was installed, which requires approximately 42 miles of new wire.

The rolling stock to be used on this new electrified line is of the Long Island Railroad's latest type, which was described in ELECTRIC RAILWAY JOURNAL for Feb. 2, 1924. In anticipation of the inauguration of the new electric service to Babylon 40 new steel motor cars were purchased recently and 60 steam coaches were converted into trail cars for use in electric service. The standard make-up for electric train operation of the Long Island Railroad is one trailer to two motor cars. Each motor car weighs approximately 115,000 lb. and is 64½ ft. long. The trailers weigh 70,000 lb. each and are approximately of the same length. The seating capacity of both motors and trailers is 78 passengers.

In order to provide for the transfer of passengers from steam trains to electric at Babylon, and also properly to handle the traffic incident to the new electrification, it was necessary to reconstruct the Babylon station. The station building was moved about 15 ft. and a new low-level cinder and screening platform was installed next to the station for incoming Babylon passengers who use the electric trains. For interchange passengers, two high-level island platforms were constructed and an overhead foot bridge with stairways was provided to connect to these island platforms. All platforms are of sufficient length to take eleven-car trains, and the island platforms are partly sheltered.

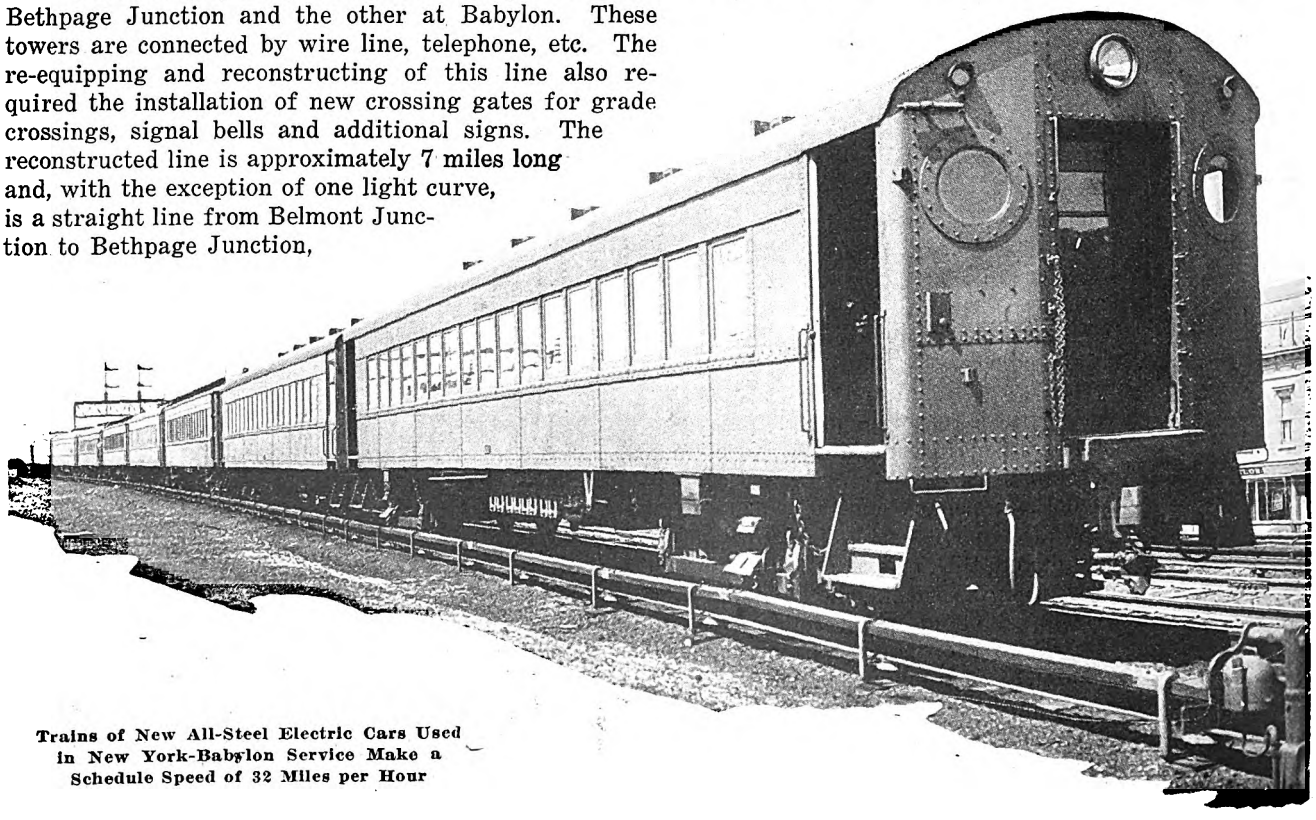
For the operation of steam trains to and from points east of Babylon, the old Central Extension Railroad between Babylon and Bethpage Junction has been completely rebuilt. New 100-lb. rail was used in track construction, with creosoted ties and other track fittings. This line is controlled at each end by signals and interlocking plants, one tower being located at Bethpage Junction and the other at Babylon. These towers are connected by wire line, telephone, etc. The re-equipping and reconstructing of this line also required the installation of new crossing gates for grade crossings, signal bells and additional signs. The reconstructed line is approximately 7 miles long and, with the exception of one light curve, is a straight line from Belmont Junction to Bethpage Junction, at which point it is connected by curves to both the main line and the Montauk division.

The electrification of the Montauk division between Jamaica and Babylon and the consequent change of motive power from steam to electricity, together with the routing of express trains to and from points east of Babylon by way of the new line, increases the capacity of the whole Long Island Railroad system. Congestion at Jamaica is reduced through the elimination of trains which formerly were required to transfer passengers from steam to the electric service on this branch. Delays to trains also are eliminated through the reduction of stops that steam trains make. This arrangement provides that where steam and electric service are operated over the same lines the local trains cannot interfere with the usual schedule of passenger trains. The railroad management has made no special attempt to reduce the running time of trains, but has worked out a schedule which will be dependable. The schedule speed of electric trains is 32 m.p.h.

With this new electrification, the Long Island Railroad will have more than 300 route-miles of electrified track. The electrification to date has required an expenditure of approximately $25,000,000.

A noteworthy feature of the electrification is the unusually rapid growth of population along the electrified lines. During the twenty years that the Long Island has been instituting electric service the population of Long Island, particularly in the communities served by electric trains, has risen enormously, as is shown in the accompanying table giving the number of commuters which were carried in 1905 and 1924. Twenty substations have been erected to date, and the combined rated capacity is 91,500 kw. The electric rolling stock now used consists of 905 cars. These include 615 steel motor cars, 52 combination steel motor cars, 17 baggage cars and 221 trailers.

Power for the Long Island electric operation is furnished by the power house of the Pennsylvania Railroad.



Trains of New All-Steel Electric Cars Used in New York-Babylon Service Make a Schedule Speed of 32 Miles per Hour

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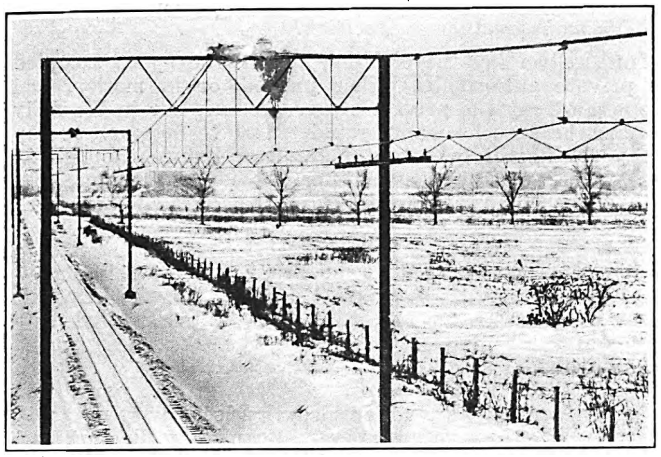

Laced Catenary Construction Installed for Tests at Erie

factor of safety of three under the following maximum conditions: ½ in. of ice on all parts, 8 lb. per sq.ft. wind load and a temperature of 0 deg. F. Its appearance is shown in an accompanying illustration.

The first four tests included operation of a train at slow and fast speeds with low and high current collection. Speed data are given in the following table. One pantograph was used in the first three tests and two in the fourth:

Mile Post	Time			Speed M.P.H.		Current, Amp.
	Hours	Minutes	Seconds	Instantaneous	Average	
1.2	3	25	12	20		
1.3	3	25	30	28	30	2,650
1.4	3	25	40	31		
0.8	3	54	45	16		
1.0	3	55	15	21	30	4,000
1.2	3	55	37	27		
0.4	4	09	14	14		
0.6	4	09	31	31	65	2,700
0.8	4	10	50	50		
1.0	4	10	60	60		
0.4	3	39	18	16		
0.6	3	39	48	32	60	5,400
0.8	3	40	8	52		
1.0	3	40	20	62		

Stationary tests were then made under the various exhibits. With a train standing under the middle of the Aluminum company section using two pantographs 5,300 amp. were collected. After five seconds the wheels slipped. A second attempt was made to hold 5,300 amp. for 30 seconds, but again the wheels slipped after five seconds. The third attempt was made, using one pantograph collecting 5,000 amp., and once more the wheels slipped after five seconds. For this test the resistance grids in a gondola car were loaded to full capacity, then the controller of the locomotive was notched up to get 5,300 amp.

A train standing under the middle of the American Brass Company section using one pantograph collected 6,000 amp. for 30 seconds. Under the American Steel & Wire Company section, using one pantograph, 5,200 amp. were collected for 30 seconds, and under the Copperweld Steel Company section 5,300 amp. were collected for 30 seconds.

Sales Letter Sent to Beaver Valley Employees

C. D. SMITH, general manager of the Beaver Valley Traction Company, New Brighton, Pa., on May 7, 1925, addressed to the employees the following letter about selling the service of the railway:

It costs approximately 42 cents for every mile that a street car operates. The heavier cars cost more and the smaller cars less, but the average is 42 cents per mile. That means that it costs that amount to transport one passenger one mile if he is the only one on the car, and some of our men know of trips where they have run a mile without a passenger.

We need passengers, plenty of them, all classes of them, at all times of the day. You can find some of these new passengers.

STOP - THINK

Don't you know of some one who is not using our cars to any great extent, if at all? Certainly you do. Well, then, it is your job to sell that person our street car service. Go at him, and if you need any help call on me or any other member of our organization.

We have a service of which we are proud. Let's prove this by selling it. Thanks!

Traffic Congestion Studies in Detroit

H. M. Gould, Assistant General Manager Department of Street Railways, Detroit, Mich., Discusses Relations of Buses and Electric Cars and Relative Space Occupied by Different Vehicles on Streets

CONGESTION on the streets of Detroit is as acute as it is in other cities. Perhaps it is more acute in Detroit than in many other large communities, because Detroit is very much of an automobile city. It is the home of many large automobile factories. Its streets are well paved and encourage automobile usage.

In its present campaign to secure better street conditions, the Department of Street Railways, Detroit, which operates all of the electric car lines within the city limits, is emphasizing greater economy of street space of the trolley car and bus as compared with the private automobile. Some of these facts are being brought out in a series of bulletins issued to its operating and division employees, known as "Economics Thoughts." These bulletins are signed by H. M. Gould, assistant general manager.

Economics Thought No. 2, issued April 4, 1925, was the first of these bulletins to discuss street congestion. In it, Thomas P. Henry, president of the American Automobile Association, is quoted as follows:

There are too many varieties of passenger-carrying units in traffic. There is the street car, the automobile, the bicycle, the horse-drawn vehicle, and most illogical of all, the street railroad train at grade crossings. *If these are not to give way to one type,* then they must be segregated for the safety of the public.

The suggestion is then made to reduce the number of units as well as the variety, and a table is given of the street space taken by different vehicles, taken from an article by Daniel L. Turner in the ELECTRIC RAILWAY JOURNAL for June 9, 1923. A photostat of the portion of this article descriptive of the figures accompanied the bulletin.

A reprint of Economics Thought No. 3, issued on April 22, 1925, follows:

CITY OF DETROIT
Department of Street Railways

RAIL AND COACH LINES

To Operating and Traffic Division Employees of the Department of Street Railways:

ECONOMICS THOUGHT NO. 3

How Can We Relieve Traffic Congestion?

How Can We Bring About Some Sort of Rapid Transit, at Least Until Subways Are Built?

You will recollect that Economics Thought No. 2 called attention to "Street Space Occupied by Cars and Buses,"

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and that Mr. Turner called particular attention to the uneconomical use of street space by the passenger carrying automobile and the taxicab.

In *Economics Thought No. 3*, we are going to invite your attention to the situation here in Detroit by quoting some figures taken from the Rapid Transit Commission's report of October 15, 1924, which covered a traffic count taken June 13, 1924, showing traffic entering and leaving the business district bounded by Cass, Columbia, St. Antoine and the Detroit River.

The portion of the report which is used in this discussion is given below:

TRAFFIC MOVEMENT IN PEAK HOUR, 5 TO 6 P.M., OUTBOUND FROM BUSINESS DISTRICT

Transportation	Passenger Carrying Vehicles Only: Vehicles	Per Cent	Persons	Per Cent
Individual				
Passenger automobiles	10,529	86.91	18,281	24.24
Taxicabs	499	4.12	485	0.64
Total	11,028	91.03	18,766	24.88
Collective				
Jitneys	301	2.49	1,713	2.27
Buses	148	1.22	7,890	10.46
Street car trains*	637	5.26	47,062	62.39
Total	1,086	8.97	56,665	75.12
Grand total	12,114	100.00	75,431	100.00

*Approximately 800 cars.

JUST LOOK AT THOSE FIGURES!!

Don't be like the fellow who owned the watch and who couldn't tell time, when asked by his friend, "What time is it?" pulled out the watch and showing it to his friend (who couldn't tell time either), said, "There you be!" The friend looked at the watch and said, "Darned if it ain't!"

The figures just given say more than "Darned if it ain't!" The passenger automobiles comprised 86.91 per cent and carried 24.24 per cent. The buses comprised 1.22 per cent and carried 10.46 per cent. The street car trains comprised 5.26 per cent and carried 62.39 per cent.

Supposing we check up on the street space used by the various types!

AREAS OCCUPIED BY VEHICLES

Kind	No. of Vehicles	Average Area Sq. Feet	Total Area Sq. Feet	Passengers Carried
Passenger autos	10,529	78.2	823,367.8	18,281
Jitneys	301	78.2	23,538.2	1,713
Total	10,830	.....	846,906.0	19,994
Taxicabs	499	79.8	39,820.2	485
Buses	148	200.0	29,600.0	7,890
Street car trains (800 cars)	637	356.0	284,800.0	47,062
Total	1,447	.....	354,220.2	55,437
Grand total	12,277	.....	1,201,126.2	75,431

The passenger automobiles carried 24.24 per cent and occupied	823,367.8 sq.ft.
The buses carried 10.46 per cent and occupied	29,600.0 sq.ft.
The street car trains carried 62.39 per cent and occupied	284,800.0 sq.ft.
The percentage of space occupied by automobiles	72.37
The percentage of space occupied by buses	2.60
The percentage of space occupied by street car trains	25.03

Now, let's do some "supposing!"

Suppose we assume that all the people carried had been carried in either taxis, buses or street cars.

How Much Space Would Have Been Occupied?

Kind	No. of Vehicles	Average Area Sq. Foot	Total Area Sq. Foot	Passengers Carried
Taxicabs	499	79.8	39,820.2	485
Buses	180	200.0	36,000.0	10,761
Street cars (827 trains)	983	356.0	349,948.0	64,185
Total	1,662	.....	425,768.2	75,431

A saving of area of 775,358 sq.ft. or 64½ per cent.

You may say, "Well, what of it?" or, you may say, "Figures don't lie, but liars will figure."

Did you notice the article in the daily papers of April 10, 1925, in which it was suggested that Woodward, Michigan and Grand River Avenues be widened to the tune of $100,000,000?

Suppose the cost was only a half or a quarter of that amount?

Who is going to put up the money?

Suppose the merchants along those streets put up the money, who bears the cost ultimately?

We all do—taxpayer and rent payer alike!!

Let's make another supposition!

Suppose we say the difficulty lies in the space occupied by private automobiles either parked, or in motion, and suppose we say the private owner uses his car in his daily business because he wants rapid transit? Suppose we say the problem will be solved if we can induce the private automobile owner to leave his car home by providing him with a service just as good or even better than that given by his own car?

As a means of doing this, your attention is directed to a copy of article entitled "Four Track Operation in Providence" which appears on pages 411 and 412 of the ELECTRIC RAILWAY JOURNAL for March 15, 1924, a photostated copy of this article being sent herewith.

The principal points of this article are:

The Railway Company instituted bus service parallel to its rail line service, and carried the local passengers in buses and the through passengers in express trolley cars.

The result was a reduction of running time from fifteen to ten minutes over a distance of 1¾ miles and more passengers are being carried by cars and buses than were formerly carried by the cars alone.

We would be glad to receive your comments on applying this scheme to our system.

H. M. GOULD,
Assistant General Manager.

April 22, 1925.

SUMMARY OF PRINCIPLES

A recapitulation of the position being taken by the department is given by Mr. Gould also in a letter recently sent to the Associated Technical Societies of Detroit and published in its April bulletin. In this communication Mr. Gould referred to the data which appeared in the two "Economics Thoughts" mentioned and also to a paper on "The Influence of the Automobile on Regional Transportation Planning" in the April, 1925, *Proceedings* of the American Society of Civil Engineers. He then sums up the governing principles as follows:

1. Co-ordinated bus and rail line service has already been tried out with a resulting decrease in the time required to journey between two given points, and with it an increase in the number of passengers carried.

2. A check on the articles in the technical and daily press shows that the downtown traffic congestion is agitating public officials, railway executives and others in many cities, not only in the United States but in other places throughout the world.

3. The quotations as hereinbefore given, from articles written or speeches made by street railway men, an automobile manufacturer, an ex-street railway commissioner, a manufacturer of electrical equipment, a consulting engineer, the president of the American Automobile Association, a commission appointed to investigate railways, etc., are of the opinion that the bus has a place in the general transportation scheme and none of them is inclined to the belief that trolley cars are obsolete.

4. The traffic congestion is brought about primarily by the use of the private automobile, and the question arises as to what can be done to induce the automobile owner to leave his car home and use other vehicles having more economical street space requirements. If this is not done, the money required for street widening to provide storage for these automobiles will be all out of proportion to the benefits derived.

5. If there is inaugurated a bus service supplementary to the rail lines and incorporating therein the comforts (plus added convenience due to lack of necessity for finding parking space) of the private car, will or will not the owner of said car leave it home and thereby help to reduce the traffic congestion?

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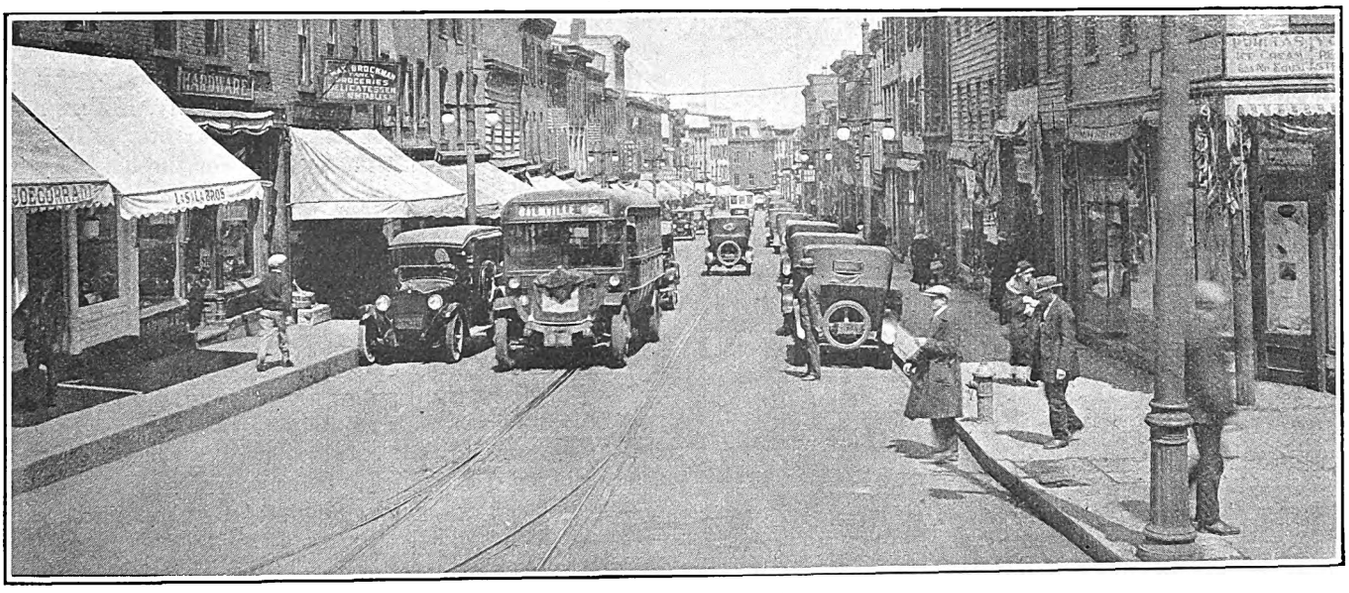
Two Years of All-Bus Operation in Newburgh

More Service Is Now Being Given by the Bus System than Formerly Was Furnished by the Street Railway Which It Has Replaced, but the Number of Passengers Carried Is Smaller and the Fare is Higher



Buses Are Less Often Blocked by Other Traffic on Colden Street, Where Automobile Parking Is Permitted, than Was Formerly the Case with the Trolleys

FOR the past two years all local traffic in Newburgh, N. Y., a city of 30,000 inhabitants, has been carried by bus. Regular street railway service was suspended on March 31, 1923, on the last remaining line of the Orange County Traction Company. The Newburgh Public Service Corporation, first organized as a subsidiary of the railway, has now become its successor. The area served by the present bus routes is larger than that formerly served by the trolleys. Traffic delays have been reduced on certain narrow streets where other vehicles frequently used to block the cars. For these reasons public sentiment is favorable to the new transportation system. Financial results, however, have been discouraging and on account of the large deficit in 1924 it was necessary on Feb. 1 of this year to increase the fare from 7 cents to 10 cents.

Formerly there were three street car routes in the city, one being a double-track line from the business district to the west end city limits, the two others being single-track crosstown lines. Besides completely covering all the old car routes, the present bus routes serve territory not formerly provided with railway service and where the traffic for many years to come would not have justified the laying of track.

As a result of shipbuilding activity at Newburgh during the war a housing development was undertaken on a tract of land in the northwestern section of the city. For the most part the workers who lived there walked to the shipyard, which was located to the south of the town on the west bank of the Hudson River. A stage operated by the shipbuilding company provided transportation for the office force. With the closing of the shipyard after the war the transient population left the city and the houses and apartments at the housing tract were taken over by a more permanent class of residents. This tract, now called Colonial Terraces, has become populated entirely by a group of people who own their own houses.

It was to provide additional transportation facilities for them that bus operation was started. Because the area of the city is not large and the average length of ride is comparatively short, it was not thought desirable to operate the buses simply as feeders to serve this housing tract and compel passengers to transfer to a car to get downtown. Moreover, the railway was hampered by having double track on only one street, Broadway. Service on the two crosstown lines was handicapped by frequent delays on turnouts. Accordingly in the fall of 1922 the railway established three bus routes, two to replace its crosstown lines and a third to serve the housing tract. Car operation on the Broadway line was continued.

Under the laws of the state of New York a railway company is not allowed to operate buses. The Newburgh Public Service Corporation, therefore, was formed as a bus operating subsidiary of the Orange County Traction Company. Seven single-deck Fifth Avenue type J buses were purchased and placed in service in September of that year.

At first many more people rode the buses than had previously patronized the cars on the crosstown lines. For example, during December, 1922, the buses carried 106,000 passengers as against 47,000 carried by the trolleys on the same lines in December the preceding

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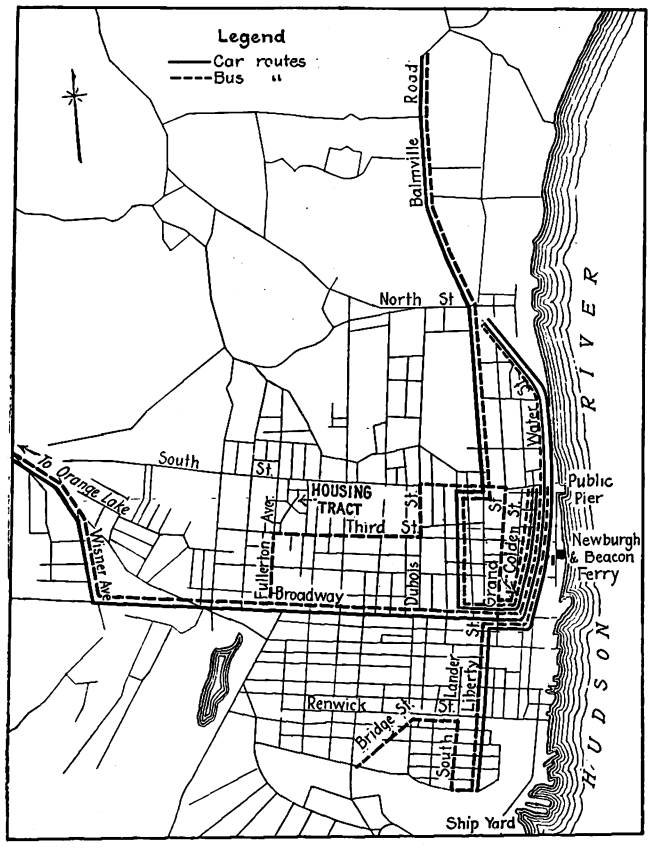

Routes of the Present Bus System Cover All the Old Car Routes and Also Serve Additional Territory

year. While this was in large measure because the railway lines had been tied up by snow for four days in the latter part of 1921, while in 1922 the buses were able to keep going all the time, it was due also in part to the additional territory served and to the novelty of the motor vehicles.

Increased riding on these routes during the first few months after their inauguration caused the railway to consider the substitution of buses for cars on the Broadway line. To test public sentiment bus service was inaugurated over this route during the early part of 1923 without making any change in the car service. It was soon apparent that many people preferred the bus. Prospective passengers allowed cars to pass while they waited for buses. As had been the case when buses were substituted for cars on the crosstown lines, the novelty of the new system was partly responsible for its popularity.

A general impression existed that the buses were quicker than the cars. This was not actually the case, however, for in spite of the elimination of turnout delays when buses replaced cars on the crosstown lines, no change was made in the schedule speed. This remained at about 8 m.p.h. Neither was any change made in the headway. This had been twenty minutes in the non-rush and twelve minutes in the rush hour. The fare on the buses was the same as on the cars.

A factor of some importance affecting the relative popularity of the cars and buses was the more comfortable seating arrangement of the latter. The railway rolling stock consisted of twelve single-truck Birney cars and 28 other two-man cars. The equipment of one-man cars was sufficient to handle the non-rush service. The two-man cars had longitudinal seats while the Birney cars had wood slat cross-seats. On the other hand the buses had comfortable cross-seats upholstered in leather. Moreover, the bus steps were lower than those of the older-type street cars.

Rather curiously, the width of Broadway, 132 ft., and the narrowness of Colden and Water Streets, 45 ft. and 52 ft. respectively, both tended to favor the bus. Automobile traffic is heavy on Broadway, and despite attempts by the local authorities to enforce traffic regulations adequate protection was not afforded to those wishing to make their way out to the tracks to board a street car. The curb-loading feature of the bus, therefore, was considered a certain advantage on this particular street.

Due to the narrowness of Colden and Water Streets and failure to restrict automobile parking, considerable traffic congestion often existed there, since insufficient room existed for vehicles to pass between the street cars and the parked automobiles. Car operation was seriously hampered by this congestion. It was felt by the merchants whose stores were located on these streets that drastic parking regulations would be unreasonable in a city the size of Newburgh. As Colden Street is the only gradual incline from the lower part of the city along the river bank to the higher portion lying west of Liberty Street, it was impossible to reroute the cars. Under these circumstances the local merchants and a majority of the public favored the substitution of buses for cars on the Broadway line.

Accordingly on March 31, 1923, car service was suspended. Seven more buses of the same type were purchased. Since that time all local traffic in Newburgh has been carried by bus. In bringing about this change to a completely motorized system the Newburgh Public Service Corporation absorbed the Hudson Transit Corporation, operating several suburban lines, and thereby acquired eleven additional buses.

Within the city bus transportation is now furnished over approximately 9 miles of route. Suburban lines bring the total operated by the company to nearly 24 route-miles. Previously the Orange County Traction Company operated only some 6 miles of route within the city and about 17 miles all told.

During the summer of 1923 the Orange County Trac-

STATISTICS OF TRANSPORTATION REVENUE AND EXPENSES IN NEWBURGH

ORANGE COUNTY TRACTION COMPANY

	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923*
Gross revenue	$195,564	$178,594	$175,168	$178,830	$203,879	$237,947	$257,627	$251,726	$218,170	$89,895
Operating expenses	153,106	143,516	132,361	128,601	160,391	189,244	232,691	209,073	197,882	109,985
Net operating revenue	42,458	35,078	42,807	50,229	43,488	48,703	24,936	42,653	20,238	—20,090
Fixed charges	47,745	47,013	47,847	47,869	47,972	46,682	46,163	46,222	46,613	35,361
Income	—5,287	—11,935	—5,040	2,359	—4,484	2,021	—21,227	—3,569	—26,375	55,452

NEWBURGH PUBLIC SERVICE CORPORATION

	1922	1923	1924
Gross revenue	$17,568	$178,879	$212,947
Operating expenses	15,207	169,779	234,518
Net operating revenue	2,361	9,100	21,571
Fixed charges	64	8,927	10,000
Income	2,297	173	—31,571

* Railway ceased operation Oct. 31, 1923.

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tion Company continued to operate open cars on Sundays and holidays between the dock of the excursion steamers and Orange Lake, 6 miles away. Tracks and wire were in place and the company had made an arrangement to purchase power. In this situation it was considered more economical to carry the occasional heavy loads by rail than it would have been to provide a sufficient number of buses to handle the traffic. On Oct. 31, 1923, however, this route was discontinued and the Orange County Traction Company passed out of existence.

Despite difficult snow conditions the buses have been able to render regular service during the winter months. A special snow plow has been bought to clear a roadway for the buses. On Broadway, piling the snow in the center of the street with a pathway on each side is preferred by the automobile driver to the old practice of having the snow thrown over in the direction of the curb by the railway plow. It is said that other vehicles find it easier to use this cleared area than formerly was the case when only the tracks were cleared.

In a number of instances buses have created public good will by the ability to provide special service. At Christmas when midnight services were held in the churches buses were waiting outside to carry the people home afterward. As the churches are located at some distance from the car line no such accommodation could have been provided by the trolleys. Public opinion is divided on the question of the relative noise of buses and street cars. Some people think that the bus is more quiet than the trolley. Others say that the buses are rather noisy due to the frequent gear shifting on the many steep hills in Newburgh. On account of the vibration of the engine bus riding is more noisy for the passenger than car riding. The matter of noise appears not to have been an important factor influencing public opinion one way or the other.

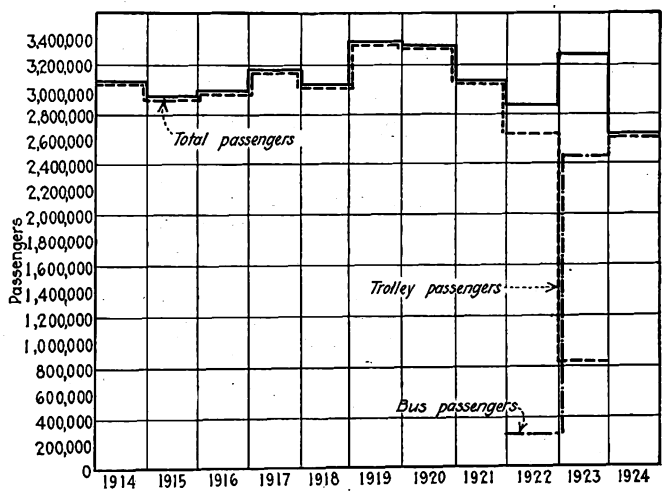
Financial Aspects Discouraging

On the financial side, however, the picture of bus operation in Newburgh is far from rosy. For 1922, the year when bus operation was commenced, the net income, after taxes and interest and depreciation had been paid, was $2,297. The following year it was $173. In 1924 there was a deficit of approximately $31,500.

Approximately 745,000 bus-miles were operated last year as against a maximum of only 610,000 car-miles in 1921 and an average of about 580,000 car-miles per year. The total number of passengers carried, however, was only 2,850,000, less than had been carried on the railway in any year since 1914. Passengers per bus-mile averaged only 3.8 as compared with an average of 5.4 passengers per car-mile from 1914 to 1921 inclusive. Revenue per bus-mile in 1924 was only about 28 cents as against a gross revenue of 43.8, 41.4, and 40.4 cents per car-mile in 1920, 1921 and 1922 respectively. To offset this serious decrease in revenue per mile operated there was also some decrease in operating expenses. These average 31 cents per bus-mile. This figure is substantially lower than the cost per car-mile, which had been about 40 cents, 34.3 cents and 36.7 cents in 1920, 1921 and 1922. Prior to 1920 the cost of car operation had been much less, being only 21.8 cents per car-mile in 1917.

The seriousness of the situation is shown by the large deficit which occurred last year despite substantial reductions in fixed charges and taxes. Actual operating expenses exceeded the gross income by $21,500, a situation that had never occurred during the period of railway operation. Revenue and expense figures for both railway and bus are given by years in the accompanying table.

The Orange County Traction Company was obliged to pay for paving between the rails and 2 ft. outside. No such stipulation is carried in the present bus franchises. Eventually, however, the car tracks will have to be removed and the pavement restored to its original condition. The cost of this change will probably have to be borne by either the railway or the bus



Comparison of Total Passengers Carried by Years

company. In either case a heavy additional expense will thus be placed on the buses, and a considerable sum added to the present deficit.

Application was made by the company early in 1925 for a higher fare. This was put in effect on Feb. 1, the rate being 10 cents for a cash fare, with eleven tickets for $1. Sufficient time has not yet elapsed to permit accurate estimates to be made concerning the effect of this increase in fare. As was to be expected a decrease in traffic was the immediate result. Riders who deserted the bus when the fare was raised, however, are now beginning to come back. Up to the present time the increased rate has just about offset the loss occasioned by reduction in the number of passengers. It is expected, however, that the traffic will eventually pick up again and that the revenue of the company will be larger than under the old rate.

Bus Outings and Tours at Baltimore

OUTDOOR motor and trolley tours in the historic "Blue and Gray" country surrounding Baltimore are now being offered by the United Railways & Electric Company of Baltimore, which has just bought three de luxe buses and six additional double-deckers, with all-weather tops. A recent advertisement of the company's "Outings and Tours" department describing the complete system of tours mentions such objectives as Gettysburg, Annapolis, Mount Vernon, Washington and the Shenandoah Valley, as well as "Seeing Baltimore" trips, all available through the new department. This kind of trip by bus, it is believed, will appeal especially to Sunday schools, clubs and societies wanting to plan outings and picnics. A special staff is in charge of this business.

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Association News & Discussions

Standardization in Electrification Urged at A. I. E. E. Meeting

Prospects for Equipping Trunk Lines for Electric Operation Furthered by a Universal System—Co-operative Work of Electrical Manufacturers Pledged

RAILROAD electrification from the executive standpoint was treated by many leaders in the industry at the annual meeting of the American Institute of Electrical Engineers in New York on May 15. Secretary of Commerce Herbert Hoover pointed out the necessity for standardization in so far as it pertained to fundamental principles so that capital cost could be reduced and losses kept at a minimum. He urged that the fundamental of standardization be applied so that equipment could be interchangeable and that voltage, frequency and other electrical characteristics will permit the railroads to purchase power from the light and power systems that are being built up in all parts of the country. Standardization, if started now, will save millions in the future. It is necessary that there be correlation of electric light and power groups with the railroad groups in order to place at the disposal of the railroads ample and reliable electric service.

"The people of the nation have a great and vital interest in this problem," Mr. Hoover stated. Such plans if wisely laid will considerably shorten the time until the benefits of increase in transportation facilities from electrification can be enjoyed. Standardization, at least in fundamentals, will facilitate the development of a co-ordinated electrified transportation system which will give a maximum of service with the best utilization of capital and labor."

Gerard Swope, president of the General Electric Company, stated that the saving of coal each year if only one-half of the railroad mileage of the country were electrified would be approximately 40,000,000 tons, which at the prevailing market price would amount to $120,000,000. In his opinion the steam locomotive will undoubtedly continue for many years in the service with which it has been so closely identified for nearly a century and will be improved. There still remain the limitations of power imposed by restrictions in size of the locomotive boiler and firebox and the inherently low fuel economy in comparison with the modern steam electric power station. The electric locomotive, on the other hand, is not restricted in its capacity and the central station from which it derives its power is stationary and may have a capacity many times in excess of any number of locomotives that may be on the line at the same time. Electrification thus provides greater possibilities for handling heavier traffic more expeditiously under varying conditions of railroad operation, with less human effort and supervision, and at a reduced cost.

Mr. Swope pointed out that there was still a difference of opinion in the minds of prominent engineers as to the relative merits of alternating and direct current to meet the varying conditions of transportation service in the United States. However, he stated, this difference is far less important than the difference between either and steam locomotives. The direct-current system was adopted for France and England, while in Germany and Switzerland alternating current has been adopted.

Mr. Swope continued: "Just as in this country we have a standard gage for tracks, standard couplers and standard brakes so as to make our equipment interchangeable, so it is to be hoped that a national electrical standard will be adopted, with all its attendant advantages, allowing us to mobilize our resources for the greatest economic development of this country. As the Secretary of Commerce has pointed out, one common system would save millions in equipment."

Standardization will also increase the ease of raising capital and will make less capital needed, according to Mr. Swope. The light and power companies can build the power station and interchangeable equipment will reduce the capital needed. It is to be hoped that railroad executives will approach this problem from the national standpoint. Mr. Swope added that he was happy to pledge the assistance of the General Electric Company in developing whatever system is adopted as standard.

Paul S. Clapp of the Department of Commerce also urged that standardization in railroad electrification should proceed at once. He pointed out that standardization was a public obligation and required the closest co-ordination of the railroads and the light and power industry.

E. M. Herr, president of the Westinghouse Electric & Manufacturing Company, stated that public sentiment has now begun to favor giving the railroads a fair hearing. During the war government operation caused stagnation in railroad progress and unduly stimulated other means of transportation. It seems that the time is now ripe, however, for progress to continue. He pointed out the many advantages of the electric locomotive, particularly in terminal service, suburban service and on heavy grade divisions of trunk line roads. He stated that electrical engineers and electrical manufacturers are ready to do the work required for the electrification development and that the particular system to be used in any given case was a matter of engineering study. Once, however, the system is determined there is more than one electrical manufacturer ready to do the work.

Mr. Herr stated that, contrary to general opinion, the United States is not the leader in railroad electrification. In 1924 there were in the whole world a total of 2,300 locomotives aggregating 4,259,000 hp. Of these 1,446 were alternating current and 905 were direct current. In this country a total of 465 locomotives were built or building of an aggregate horsepower of 862,000, while in Italy there were 504 built or building with an aggregate horsepower of 1,290,000; in France, 366 locomotives aggregating 384,000 hp.; in Germany, 304 aggregating 518,000 hp., and in Sweden, 214 aggregating 384,000 hp. He stated that a recent engineering development is the production of an electric locomotive which permits the use of single-phase, three-phase or direct current at any voltage desired. This was a long step toward the free interchange possibilities of railroad equipment, said Mr. Herr. He also urged that power be purchased from the light and power companies. In his opinion there will soon be necessity for the rapid expansion of railroad transportation facilities, in which the electric locomotive will have a major place.

The fact that manufacturers of electrified equipment for railroads are now ready to construct any system is of great interest to railroad executives, stated C. H. Markham, president of the Illinois Central Railroad. This status is a great contribution to the cause of electrification, which should increase the capacity of the transportation system and decrease the cost per unit of service and per unit of investment if electrification is successful. Mr. Markham stated that there are great possibilities along these lines in electrification, and in particular along the lines of decreasing the cost of transportation so that railroad expansion could occur in this country to meet the business situation. In his opinion each railroad property is an individual problem for joint study and the solution of one railroad problem is not necessarily the solution that can be applied to all railroads or even all parts of one property. It is necessary also that simplicity be borne in mind and the equipment be operated and maintained by the present railroad forces. The goal to be sought by elec-

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trification, in the opinion of Mr. Markham, is "what is best shall be done."

Robert Cary, general counsel of the New York Central Railroad, pointed out that the ideal development of transportation systems in the United States perhaps meant the substitution of electric for steam locomotives, but that the problem now confronting the railroad was not an ideal one, but a concrete one. He pointed out the criticisms that could be made on any generalization and stated it was necessary to recognize the actual problem confronting the railroad and the actual conditions under which they could develop. In the present situation the transportation companies are living from hand to mouth and not earning much. When a railroad man is confronted with the problem of electrification he finds he has no money and has no place to get it. This has a great bearing on any story told him about the future electrification and the future earnings, as he must persuade his directors on the basis of present conditions. The railroad man also doubts, when peak loads or business fall off and stagnation periods occur in transportation, whether the electrified system will permit the same economies with service curtailed as are obtainable with steam equipment. He pointed out that the possibilities of electrification seemed to be much brighter now in that railroad men are not specialists in particular systems of electrification and the present plan to have the specialists agree among themselves and then tell the railroad people the consensus of opinion as to the best system to be used on a particular system or part of a system was the only logical approach to electrification. He urged that the true principle of electrification be applied to particular problems and then that the concrete solution be made on the basis of the best possible compromises.

C.E.R.A. Midsummer Meeting Program

PROBLEMS of increasing the business and improving service will be taken up at the midsummer meeting of the Central Electric Railway Association, which will be held June 2-4 at French Lick Springs Hotel, French Lick, Indiana. Following is the complete program for the meeting:

TUESDAY, JUNE 2, 9:30 A.M.

Meeting of Executive Committee.

2 P.M.

Business meeting.

"A Survey of the Traction Situation," by Lucius S. Storrs, managing director American Electric Railway Association.

"How to Increase Passenger Traffic Through Advertising," by Frank L. Blanchard, director of public relations Henry L. Doherty & Company.

"A Major Operation on the Interurbans," by John A. Beeler, consulting engineer, New York City.

Discussion, led by:

Robert I. Todd, president Terre Haute, Indianapolis & Eastern Traction Company; W. S. Rodger, general traffic manager Detroit United Lines; F. D. Norveil, general freight and passenger agent Union Traction Company of Indiana; T. H. Stoffel, special engineer Westinghouse Electric & Manufacturing Company.

WEDNESDAY, JUNE 3, 9:30 A.M.

"Trend of Practice with Reference to Railway Power Systems," by G. H. Kelsey, superintendent power Cleveland Southwestern Railway & Light Company.

"Automatic Substation Performance," by Charles H. Jones, electrical engineer Chicago, North Shore & Milwaukee Railroad.

"Four Years Experience in Automatic Substations and Results," by L. D. Bale, superintendent substations Cleveland Railway.

Discussion, led by:

Allan J. Smith, superintendent of power Cleveland Railway, Power & Light Company; C. C. Argabrite, electrical engineer Interstate Public Service Company.

2 P.M.

Central Electric Railway Master Mechanics' Association, business session.

Joint Meeting of Transportation and Traffic Officials, round-table discussion.

THURSDAY, JUNE 4, 9:30 A.M.

"New Developments in Car Design," by Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL.

"Problems of Car Construction and Reduction of Noise in Passenger Cars," by J. A. Creig, editor *Electric Traction.*

Discussion, led by:

G. L. Kippenberger, assistant general manager St. Louis Car Company; Thomas Elliott, vice-president Cincinnati Car Company.

"Getting the Community with You," by Thomas Fitzgerald, vice-president Pittsburgh Railways.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 25-26—Midwest Electric Railway Association, Baltimore Hotel, Kansas City, Mo.

May 25-28—National Association of Purchasing Agents, Milwaukee, Wis.

May 27-28—Midwest Motor Transport Conference, Hotel La Salle, Chicago, Ill.

May 28—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass.

June 2-4—Central Electric Railway Association, French Lick Springs, Ind.

June 3—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.

June 3-5—Iowa Electric Railway Association, Waterloo, Iowa.

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Dire Penalties for Bad Advertising*

BY LABERT ST. CLAIR
Director of Advertising American Electric Railway Association

BETTER advertising copy will be written in the United States only when we have stricter laws controlling the writing of it, and when we have judges who will enforce these laws impartially. The following acts should be made illegal and penalties imposed as indicated:

For trying to convince anyone that advertising is anything except common sense salesmanship on paper—life.

For writing on a subject which we do not fully understand and which we have been too lazy to investigate fully—twenty years.

For "yessing" the boss and putting out a piece of copy which we know is poor—nineteen years and eleven months.

For writing a piece of public utility copy which even Oswald, the squarehead who washes plates at the roadhouse, cannot understand — eighteen years.

For using the words "mass psychology" or "reaction" either publicly or privately—life minus one day.

For running the pictures of any of the bosses' children or infant nearrelatives on any piece of printed matter—fourteen years.

For trying to create sympathy for any company, incorporating a whine in any piece of copy or trying to sell service by any means except on its merits—the dungeon.

For contributing 1 cent to any special edition or "puff" proposition — twelve years.

For issuing copy for the news columns which will not pass on its merits as news matter—eleven years.

For trying to convince anyone that his mimeographed letter with the name filled in is a personal communication—ten years at hard labor. Preferably that of reading the letter again and again.

For writing flowing sentences, sprinkled with semicolons, but concealing from the reader what we are talking about—the rock pile.

For writing about and picturing our plant machinery to the entire exclusion of our human machinery—the pillory.

For writing flat, verbless, tomato-can-label headlines — the straitjacket

While all of us are in jail, we might ably spend our time trying to boil down the Book of Proverbs and Gray's Elegy. Upon emerging, we will have a much better appreciation of the value of space.

*Abstract of an address made before Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

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Use of Buses in City Service*

By William W. Holden
Superintendent Traction Department, San Antonio Public Service Company, San Antonio, Tex.

SELECTION of the right type of bus to meet the service requirements is vitally important. Since double-deck buses are not practical in any but our largest cities, where shade trees are not a prohibitive factor, I will discuss only the single-deck bus here. Seating capacity is a factor that should be given especial thought, as the success or failure of bus operation may depend on this. Single-deck city buses range in capacity from twelve seats to 32 seats.

It is axiomatic that the largest possible unit should be the most economical as there are so many items of expense, such as platform labor and cleaning, that are very nearly the same for any size unit. The 29-passenger bus is apparently the largest size which can be easily maneuvered in traffic, and it is my opinion that this will prove the most popular and economic size. There is, however, a very large field for smaller buses to be used where there is not sufficient demand for service to fill large buses on a reasonably frequent headway. Appreciable savings can be made by using a unit with a seating capacity of about twenty. Units smaller than this are not likely to show much, if any, additional saving in operating expense.

Frequency of headway is certainly one of the most important features of any service so far as winning patronage is concerned. It seems to me that we have two distinct fields of service requirements; one where frequency is the determining factor and which can best be served by a twenty-passenger bus; and the other where capacity is of more importance and which requires the 29-passenger bus.

If we are to learn the possibilities of the use of buses, we must know exactly what it costs to operate them. Depreciation is an important part of this cost. In the case of street cars, whose life is comparatively long, the question of depreciation has never received all the consideration that it should, but since buses have such a comparatively short life, an allowance for depreciation has been immediately recognized as one of the necessary items in the cost of operation. There is not much uniformity in the basis on which depreciation is charged, but there is a very general acceptance of this as a proper charge against operation.

The easiest method of figuring depreciation is the time basis, and a larger number of companies are using this. The more logical method is the mileage basis, as the charge off is proportional to the use obtained from the bus and consequently more nearly proportional to its earnings. On a mileage basis, there are companies figuring their depreciation on an estimated life of 200,000 to 350,000 miles, and on the time basis from three to six years.

Of course the largest single item in the cost of bus operation is platform labor. This is proportional to the service obtained from the buses and therefore needs no especial consideration in accounting. Gasoline consumption is another large item that has the same characteristic. However, the cost of tires is one that causes considerable fluctuation in the amounts expended. Some confusion as to actual costs of operation may result except over long periods of time unless a fixed charge is made, proportional to the mileage. In order to make this item more uniform it is recommended that a tire renewal fund be created by charging each bus with a certain amount per mile operated and that purchases and repair of tires and tubes be made from this tire renewal fund.

Net earnings from bus operation required to pay a reasonable return on the money invested represent such a comparatively small amount of the gross earnings that slight variations in traffic may change a net to a loss. For this reason as soon as there is any surplus above actual operating expenses a contingency fund should be established. After this has been built up to some predetermined sum considered adequate, the balance above this may be safely used in paying dividends.

A sufficient rate of fare should be charged to make the bus operation pay for itself. It is notable that practically all successful city bus operation is on the basis of a higher fare than is charged on the street cars. A higher rate of fare is necessary because of greater operating cost, and because the bus is being operated in less settled areas. The popularity of the bus service makes it possible to get higher fares with public indorsement, and we should endeavor to make each step in transportation progress pay its own way rather than to saddle bus losses on other parts of the system.

*Abstract of paper presented before railway division, Southwestern Public Service Association, Houston, Tex., May 5-8, 1925.

Meeting of the New England Street Railway Club

THE May meeting of the New England Street Railway Club will be held at Copley Plaza Hotel, Boston, on Thursday, May 28. The afternoon meeting, which will be called to order at 4 p.m., will be devoted to papers and a discussion on "Car Painting and Cleaning." Papers on this subject will be read by H. G. Noble, superintendent of the Everett shops, Boston Elevated Railway; O. B. Johnson, inspector of car cleaning of the same company, and H. T. Hurlock, engineer of equipment of the Eastern Massachusetts Street Railway.

At the evening meeting, after the usual dinner, the topic will be the scope and purpose of the work of the committee on management and operation of the American Electric Railway Association. This subject will be discussed by R. B. Stearns and Elton S. Wilde, regional directors of District No. 1, which includes New England and New York; by Frank B. Walker, a member of the committee; by G. C. Hecker and R. F. Carbutt, representatives of the American Electric Railway Association, and by others. There will also be an address by Henry H. Crane on "Business at Bat."

Buffe Talks on Motor Buses

AMONG the papers presented at a three-day meeting of the Missouri Public Utilities Association held at Joplin on May 7, 8 and 9, was a discussion of "Motor Buses" by F. G. Buffe, general manager Kansas City Railways.

Mr. Buffe predicted that the time was not far off when every city of any size would have regulated motor bus service. Buses are useful, he said, in thinly populated districts and they help in larger cities during the rush. They should be regulated by law as common carriers and the laws should be uniform because they furnish interstate transportation. In his opinion street railway men should cease to think in terms of street cars only. Transportation is a business which covers many fields and in which many types of carrier and methods must be co-ordinated.

Metropolitan Traffic Problems

By Harland Bartholomew
Engineer City Plan Commission, St. Louis, Mo.

HANDLING of metropolitan traffic is today a serious problem, due principally to three phases of growth. First is the unprecedented development of mechanical transportation; second, the growing load on the street system; and third, the failure to appreciate the proper relationship between the street space and the rights of adjoining property.

Traffic regulation has not proved a solution of the problem, since it makes possible greater concentration of traffic and accentuation of conditions it tries to relieve.

The three basic factors to be considered in the solution of metropolitan traffic problems are: (1) unbalanced growth; (2) street design; (3) traffic regulations.

Unbalanced growth in the form of closely-grouped buildings of excessive height, and to numerous crowd-producing businesses such as theaters, hotels and department stores, completely upset the most elaborate systems of traffic control and the most perfectly designed street systems.

Every city should approach its traffic problems by first adopting and enforcing a regional and city planning scheme providing for complete industrial, commercial and social organization of its entire area. Traffic congestion occurs in very limited spots in every city. Rigid limitation of building heights and a reasonable spreading of crowd-producing businesses in congested centers are the fundamental steps in solving the metropolitan traffic problem. Higher and higher buildings and ever greater concentration of business are not so much monuments of business enterprises as they are symptoms of economic waste. Witness New York's $500,000,000 expenditure for subways, with congestion greater today than ever before. The "congestion tax" of New York is estimated at $1,000,000 per day,

*Abstract of a paper before annual meeting Chamber of Commerce of the United States, Washington, D. C., May 20-22, 1925.

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of Chicago $600,000. We have scarcely begun to explore the field of relation of street space to building content and use.

The second step in meeting the metropolitan traffic problem is by the design of an adequate street system throughout the present and future area of the city and its region. Elements in the design of an adequate street system are:

By-pass routes for traffic that neither originates nor terminates within the region.

A gridiron of wide streets comprising the various traffic centers of the city and region.

A series of wide streets connecting each of the important centers of the region.

By-pass streets around each center.

Parallel streets or roadways for separation of the three distinctive types of traffic—auto trucks, street cars and buses, and passenger automobiles.

Separation of street grades where great streams of traffic cross.

Provision of well-designed pavements on all major streets.

Elimination of jogs, dead ends and abrupt curves within traffic centers and on the streets comprising the main street structure.

Provision of not less than four lines of moving vehicles on each major street.

Widening the throat of particularly important intersections.

The ability of each city to design a completely satisfactory structure of major streets as outlined will depend upon its physical configuration, existing improvements, and its legal and financial resources. Such a plan, once prepared, will gradually be susceptible of execution through united co-operation of public and private effort. Wasteful, piecemeal and haphazard improvements producing no adequate returns will thereby be prevented.

Traffic regulation, the third and final step in meeting the metropolitan traffic problem, should always be devised in accordance with known traffic movements. Constant traffic counts will disclose the tendencies of traffic flow. Regulation should facilitate natural flow. Rigid and arbitrary traffic regulation unrelated to street design and natural flow may be more harmful than a certain degree of congestion.

Universal application of any one type of regulation or device is questionable and usually unwise. Depending upon conditions, certain regulations may be of value, as follows:

Synchronized or platoon movement upon heavily-used thoroughfares of great length.

"Boulevard stops" upon all major streets not under direct control.

Elimination of parking on all streets, or on important "through" streets in traffic centers during rush hours.

Limitation of parking (one hour or less) in traffic centers.

Segregation of traffic according to type.

One-way streets (more necessary on streets of restricted width).

Confinement of trucking to night hours in traffic centers, especially where no alleys exist.

Restriction of unnecessary traffic movement.

Pedestrian movement only with traffic when under control in traffic centers.

Attention should be given by all cities to the particularly valuable set of conclusions and recommendations of the recent Hoover Conference on Street and Highway Safety, especially that of a centralized authority having full responsibility in matters of traffic study, design and control.

U. S. Chamber of Commerce Considers Transportation

Motor Vehicle Transportation, City Planning and Housing Discussed—Many Other Subjects of General Interest to Electric Railway Men—New Home of Chamber in Washington Dedicated

OF CHIEF importance to electric railway men among the various sessions was the meeting of the Transportation and Communication Group held May 21. Following a brief discussion of improvement in the steam railroad situation by Carl R. Gray, president Union Pacific System, and the problems of the merchant marine, presented by A. J. Brosseau, president Mack Trucks, Inc., the regulation of common carriers was considered.

Judge John E. Benton, general solicitor National Association of Railroad and Utility Commissioners, discussed the motor vehicle problem. The present investment in motor vehicles and necessary auxiliaries, he said, is now greater than that in the steam railroads.

The use of motor vehicles for hire affects the public from the standpoints of safety, and of convenience to other users of the highway. There is a tendency to multiply such vehicles beyond the needs of the public. Certain of them are now carrying passengers and goods at less than cost, on account of the free use of the highways granted them.

The motor vehicle has come to stay, said the speaker. Its cost to the public in an indirect way must be considered as well as its effect on other established carriers. The private automobile has attracted so much traffic from the electric railways that some of them find it difficult to operate. Further encroachment will make problematical the continuance of many essential electric railways, and also of some of the steam railroads.

Evidently there should be some regulation to keep within bounds the number of vehicles that operate on the highways. Common carriers now are required to obtain certificates of convenience and necessity or licenses from state authorities. In the past the same principle has been applied to interstate business. On the whole, it has been quite satisfactory. The recent decision of the United States Supreme Court, however, has laid down the principle that regulation of carriers engaging in interstate business is beyond the regulatory powers of the states. This has thrown open the interstate business to all comers.

We cannot continue to be half slave and half free in this, as in any other matter. The problem is not whether the situation will be met but how it will be met. The legal questions involved are not difficult. The only point is whether the authority will be lodged in one central bureau, in Washington, or in the local communities.

T. R. Dahl, vice-president the White Company, did not subscribe to the statement given by the previous speaker of the present situation. Motor vehicles have paid for 42 per cent of the cost of the highways, he said. The motor vehicle industry has co-operated with the American Electric Railway Association and has worked out a code of principles for co-ordinating the services. If the electric railways can handle traffic at less cost by motor vehicles they have the opportunity to do so and are doing it.

The industry was getting along nicely until the recent Supreme Court decision, in the opinion of the speaker. No one is more concerned as to the outcome than the motor vehicle operators. Regulation means protection against unfair competition. It seems to the speaker that regulation of this business is a local problem, as the control should be given where the service is rendered. Interstate motor vehicle operation rarely extends into more than two states. Congress should pass a law empowering the Interstate Commerce Commission to grant certificates of convenience and necessity as a matter of form where the states concerned have already granted such certificates. Thus the commission can act as an arbiter in smoothing out differences.

A paper on metropolitan traffic problems read by Harland Bartholomew, engineer City Plan Commission of St. Louis, is abstracted elsewhere.

Bus Men Present Resolutions

Following a two-day session of motor vehicle operators at which an agreement was reached on principles of legislation for the regulation of motor vehicle common carriers engaged in interstate commerce, a resolution was adopted stating these principles. This was received by the group meeting of the Chamber of Commerce as a communication. It follows in full:

Congress should enact legislation giving the Interstate Commerce Commission the power to grant or refuse certificates of public convenience and necessity to motor carriers engaged in interstate commerce. In view of the fact that the Interstate Commerce Commission is already burdened with all it can handle and because of the fact that states through which such motor vehicle lines operate are primarily interested in such operations, the authority of the Interstate Commerce Commission should be limited to the granting or refusal of certificates.

Certificates shall be granted as a matter of form in all cases in which the application for a certificate is accompanied by certificates from the State Public Utilities Commissions of the various states through which the motor vehicle line is to operate, certifying that such lines will serve the public convenience and necessity; provided lines operating in good faith on March 3, 1925, shall be presumed to be necessary to public convenience and necessity and such lines in the absence of evidence overcoming such presumption shall receive a certificate

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for routes established by them. (The term State Public Utilities Commission comprehends state authorities regulating public utilities regardless of by what name called. In states where there is no public utility regulation of motor vehicles common carriers the State Highway Commissioner may issue such certificate.)

In cases where such certificates from a state Public Utility Commission cannot be obtained by the applicant the Interstate Commerce Commission shall grant a hearing on the application for a certificate in order to determine whether such operation is a matter of public convenience and necessity. In determining that fact the commission shall take into consideration existing motor transportation facilities. In all other questions involving certificates the Interstate Commerce Commission shall act as an arbiter in determining differences of opinion between the Public Utilities Commissions of the states through which such lines operate. All other regulation of operation of interstate motor vehicle common carriers shall be exercised by the Public Utilities Commissions of the states in which the operation is carried on.

The above embodies the fundamental principles of such proposed legislation and a bill shall be drafted embodying such principles and such details as will be reasonable and just having due regard to the convenience and safety of the public and the proper protection of motor carriers.

President Grant Urges Stability

In urging the nation to continue to build on what it has rather than to experiment with other types of construction, Robert F. Grant, the president of the chamber, pointed out in his annual address at the Wednesday morning session that "in the last election one-seventh of the votes cast were for a platform which favored public ownership of the nation's water power; retention of surtaxes on large incomes; restoration of taxes on excess profits and on stock dividends; progressive taxes on large estates and inheritances; reconstruction of the federal reserve and farm loan system to provide for direct public control of the nation's money and credit; creation of a government-operated marketing corporation; protection and aid of co-operative enterprises by government and state aid legislation; repeal of the Esch-Cummings law; public ownership of railroads; curtailing the power of the courts, and the election of all federal judges for limited terms. More than 4,600,000 voted for this platform."

Because of this situation Mr. Grant urged that the Chamber of Commerce continue its process of educating the American public in basic economics and of American business to govern itself.

A domestic development regarded as of encouraging and far-reaching import was the announcement by Hon. W. E. Humphrey, Federal Trade Commissioner, of a new creed by the Federal Trade Commission. It reads:

We do not believe that success is a crime.
We do not believe that failure is a virtue.
We do not believe that wealth is presumptively wrong.
We do not believe that poverty is presumptively right.
We do not believe that industry, economy, honesty and brains should be penalized.
We do not believe that incompetency, extravagance, idleness and inefficiency should be glorified.
We do not believe that big business and crooked business are synonymous. (True, we will give closer scrutiny to big business than to small business, because of its greater power for good or evil.)
We believe that 90 per cent of American business is honest.
We believe that 90 per cent of American business is anxious to obey the law.
We want to help this 90 per cent of honesty.
We want to control or destroy the 10 per cent that is crooked.

The significance of this change of attitude was recognized as going deeper than the activities of the Federal Trade Commission. The appointive power of the administration was used in such a way as to bring about this change of policy, which is taken to mean that the creed really sets forth the administration's attitude toward business.

New Building Dedicated

Chief Justice Taft, former President of the United States, paid a notable tribute to the American business man in the course of remarks at the dedication of the new building of the Chamber of Commerce, Wednesday evening.

In commenting on the need for an intelligent public opinion, the Chief Justice declared that one of the difficulties in bringing public opinion to bear upon the direction of government is the "lethargy of the ordinary citizen and his indisposition to develop an interest in important general questions." He commended the Chamber of Commerce for its efforts in arousing the citizen "to a sense of responsibility in a quasi-judicial self-examination of his own views, and by comparison with the views of his fellows brings about definite conclusions out of a nebulous, lazy, ignorant condition of mind that so often persists, even among the intelligent but indifferent."

On Thursday evening the principal speaker was Secretary of Commerce Herbert Hoover, who addressed the meeting on the subject of "Waste in Government." His paper is abstracted elsewhere.

Waste in Government*

By Herbert Hoover
Secretary of Commerce

FROM time to time I have had a good deal of co-operation with business in the elimination of waste by better organization in our economic system. Tonight it seems fair that I should take the part of a business man and talk about our governmental organization and the great wastes that result. Bad co-ordination among industries finally comes home to the people as a whole in the form of increased prices. And bad organization in government comes home in many more directions than even the taxes it wastes.

Over many years our people have been striving to better the federal administration. We have succeeded in two major steps; we still have a third equally important and perhaps more difficult one to accomplish. The first was the establishment of government employment based upon merit. The second was the establishment of adequate control of appropriations through the budget system. There still remains the third and even greater but more obscure waste—that of faulty organization of administrative functions. And the two first steps will never reach the full realization without the third.

When Hamilton laid out the scheme of executive departments he placed the different functions of administration as nearly as might be into groups of the same general major purpose under single-headed responsibility. But ever since his time we have been busy dividing responsibility by scattering services directed to substantially the same major purpose over many different executive departments and bureaus. Our governmental machinery has just grown. On the executive side of the federal government we have grown to have more than 200 different bureaus, boards and commissions, employing several hundred thousand people. For the most part they have been thrown hodge-podge into ten different executive departments, under Cabinet officers. But there are more than 40 independent establishments either directly under the President or under Congress.

*Abstract of an address before the annual meeting of the Chamber of Commerce of the United States, May 21, 1925.

As this immense number of bureaus and agencies is now grouped and organized there are six primary streams of confusion and waste. There is a confusion of basic principles; there is a grouping of federal bureaus which divides responsibility; there arises from this scattering a lack of definite national policies; direct wastes arise from overlap and conflict; indirectly large costs are imposed upon citizens by this scattering of functions and by the undue complexity of laws and regulations. There is not a single successful business organization in the country that confuses such functions the way we do in government.

	Bureaus or Agencies	Departments or Independent Agencies
Public works construction	14	9
Conservation of national resources	8	5
Direct aids to industry	5	2
Direct aids to merchant marine	14	6
Direct aids to education	6	3
Direct aids to veterans	4	4
Government of territories and dependencies	4	3
Public health	4	2
Purchase of $250,000,000 of supplies annually	In every bureau of the government	

Division of Authority in Administrative Agencies

Our other greatest weakness in organization is the division of authority over services directed to the same major purpose by scattering them through unrelated groups. Needless to say, some of the ten executive departments are fairly homogeneously devoted to a particular major purpose—notably the Department of Justice, the Navy Department, the State Department, the Department of Agriculture and the Post Office Department. But all the others, and even some of these, contain functions that should be transferred elsewhere. And there is hardly a department that should not, when it gives up those functions which are without relation to its major purpose, receive in exchange functions which properly belong in its jurisdiction but which

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are now performed by other departments.

To illustrate my point, I have made a partial collection of misfits, and in so doing I have taken no account of either incidental functions or semi-judicial agencies except so far as they have administrative functions.

It is not necessary that each of these groups should become a whole executive department, each under a Cabinet officer, but it is entirely feasible to place each of them under the supervision of a special assistant Secretary, and if we were truly intelligent we would class him as an expert and outside selection on political grounds. It is entirely secondary what department these groups are in. The big thing is to bring these kindred agencies together under one authority so that their overlapping edges can be clipped.

The divided responsibility with absence of centralized authority prevents the constructive and consistent development of broad, national policies, for there is by necessity in this division constant conflict of view within the government itself.

The forty governmental agencies which are now supposed to function directly under the President present another problem. It is preposterous to expect that with his multitude of higher obligations the President can give them anything like adequate supervision. As a matter of fact, these independent establishments conduct their activities with very little supervision or co-ordination. The last group, the straight administrative functions, expend nearly half a billion a year—as much as the total of five of the departments under Cabinet officers.

Centralization of Government

No one doubts that for many years there has been a steady tide of federal encroachments into state authority, and beyond this a steady thrust of the arm of federal government into our private business. They are now so securely intrenched as to make decentralization a very difficult job.

But if we examined these encroachments we would find some considerable part of it takes root in the very lack of organization in our federal government. There is an impelling urge in most of these agencies which pushes them on to extend some fraction of their functions into all sorts of activities which the federal government should leave to other quarters.

There is one side of the federal government that is certainly not sufficiently expanded today—that is scientific and economic research and the promotion of public interest by voluntary co-operation with the community at large. This is never an encroachment upon the rights of individuals. It can truly be better organized, but today the whole of our activities in these directions involve less than 3 per cent of our federal budget, and they bring returns to the taxpayer not in few per cent but in hundreds of per cent every year.

What we need is three primary reforms; first to group together all agencies having the same predominant major purpose under the same administrative supervision; second, to separate the semi-judicial and the semi-legislative and advisory functions from the administrative functions, placing the former under joint minds, the latter under single responsibility, and, third, we should relieve the President of a vast amount of direct administrative labor.

Nor will we ever attain this until Congress will authorize the President or some board, if you will, or a committee of its own members to take the time to do it. Congress courageously removed the civil service from politics; it created the budget, it established the classification. The remaining great step is to authorize the reorganization of the administrative arm of the government.

American Association News

Equipment

NUMEROUS specifications were considered at a meeting of the equipment committee of the Engineering Association held at association headquarters, New York City, May 14 and 15. Members present were: P. V. C. See, chairman; Daniel Durie, sponsor; W. W. Brown, R. S. Bull, A. T. Clark, L. H. Fry, J. L. Gould, J. M. Hipple, J. C. McCune, A. D. McWhorter, E. S. Sawtelle, R. B. Smythe, C. W. Squier, H. S. Sweet and H. S. Williams. Others present, not members of the equipment committee, were G. L. Schermerhorn, who represented E. D. Priest; C. A. Alden, E. M. T. Ryder, and R. C. Cram, who represented the way committee; J. S. McWhirter and W. H. Phillips.

The various subjects to be recommended for consideration by the ensuing committee were gone over. Many of the subjects which were considered this year are to be continued. Much work has been done in reviewing and bringing up to date the existing standards and specifications. The standards and specifications on which changes are to be reported include: Journal boxes and contained parts, design of axles, limit of wear gages for standard contours, plain gage for solid steel wheels, wheel mounting and check gages, gages for journal bearings and wedges, and specifications for gears.

The committee recommended that the specifications for open-hearth hammered steel axles be withdrawn. New limit of wear gages have been prepared for standard A.R.A. contours. These are the same as the A.R.A. gages. The wheel mounting gage has been revised to correspond to the new wheel contours, and a new wheel checking gage is being submitted. Combined gages for journal bearings and for wedges are to be submitted. These have the same general form as the combined gage used by the A.R.A.

Replies to an exhaustive questionnaire on boring gears and the desirability of specifying machining tolerances were gone over. It was decided that machining tolerances should be incorporated in the specifications for gears and the various allowances were decided upon. The miscellaneous methods and practices on armature and axle bearings are to be resubmitted with a revision of the table on clearances and tolerances for bore of armature bearings.

A comprehensive report by the subcommittee on design of hand brake equipment and foundation brake rigging was presented, with the recommendation that this be included in the miscellaneous methods and practices.

An analysis of replies to a questionnaire on methods of car painting was presented. The general trend indicated is toward spending less time for complete painting operations. Information received regarding the cellulose-lacquer system indicates that many companies are experimenting with this to determine its durability as compared with previous systems. Due to the short time that this system has been used by electric railways, no definite results were obtained.

The sub-committee which has been considering motor coach design in co-operation with a special committee of the Society of Automotive Engineers reported substantial progress. Proposals were made for tentative types of motor coaches for adoption as standards, together with specifications for guidance of those using motor coaches. Little progress has been made in the consideration of trolley contact devices by the sub-committee this year. An attempt will be made, however, to obtain some additional information and results of tests which various railways have been conducting, for inclusion in the committee's report.

An analysis of replies received to a questionnaire on gearing was presented. The information received this year has led to more definite conclusions than that received in previous years. This subject has been considered by equipment committees for the past four years.

Much work has been done by the subcommittee studying methods of reducing noise in car operation. A report will be presented as to work which has been done and which could be done to advantage for reducing car noise. The committee feels that the subject should be continued and that future work should be directed toward a more scientific study of car noises, including the conduct of tests and research work.

Association Publications Listed

CLASSIFIED according to subjects, all the current reports of the Bureau of Information and Service are listed in a compilation just sent out from association headquarters. The period covered in the list is from April 1, 1924, to April 1, 1925. Some 40 bulletins are included. These are available to member companies and may be obtained by application to association headquarters, 292 Madison Avenue, New York City.

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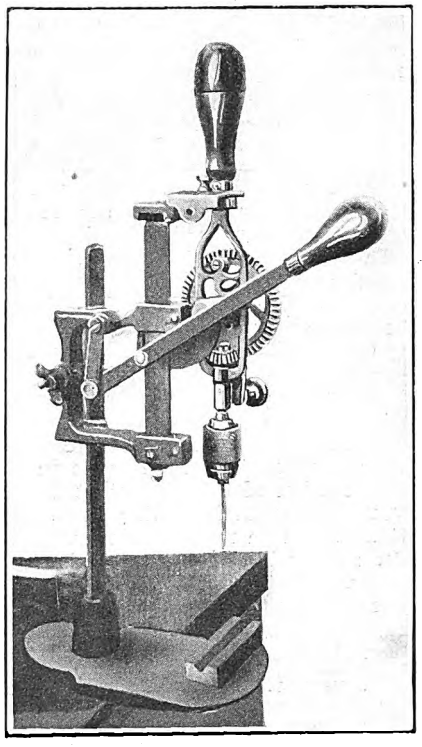
Maintenance of Equipment

Convenient Mounting for Hand Drill

WHERE many small parts are to be drilled at a bench, work can be done much faster and with less inconvenience to the workmen if a drilling fixture is used for supporting the hand drill. The accompanying illustration shows a fixture used in the 65th Street shops of the Third Avenue Railway, New York. In this case the hand drill is used for drilling small holes in various parts which must be assembled on the bench and which otherwise would require the workman going a considerable distance to the drill press in order to finish the operation after the holes are laid out.



Fixture for Holding Hand Drill for Bench Work

The fixture consists of a base with uprights for supporting the attachment to the hand drill and also a V block for centering the work accurately underneath the drill. The fixture is arranged to slide up and down on the upright support so that the drill can be located conveniently for different sized work. The hand drill is clamped to a movable arm with two clamps, and this arm is arranged to slide up and down in two guides. Movement of the sliding arm is provided by a lever with wooden handle at the end. The fulcrum of the lever is at the back of the attachment about 4 in. toward the handle end. A swing link is provided for the fulcrum, so that the movement of the slide up and down will be vertical, and any binding action which otherwise might result if a slotted arm were used is avoided. This lever arrangement gives added pressure to what would be obtained with the ordinary use of a hand drill, and the convenient method of operating makes drilling easy and also insures accurate workmanship.

Good Record of Cars Pulled In

COMPARATIVE statements for cars pulled in and maintenance costs for the properties comprising the Electric Railway Association of Equipment Men, Southern Properties, have just been issued. These give figures for car pull-ins for the twelve Southern cities in this association for the month of April and for the year to date. Comparative maintenance costs per 1,000 car-miles are given for March.

CAR PULL-INS CHARGEABLE TO CAR-HOUSES OF SOUTHERN PROPERTIES FOR APRIL, 1925

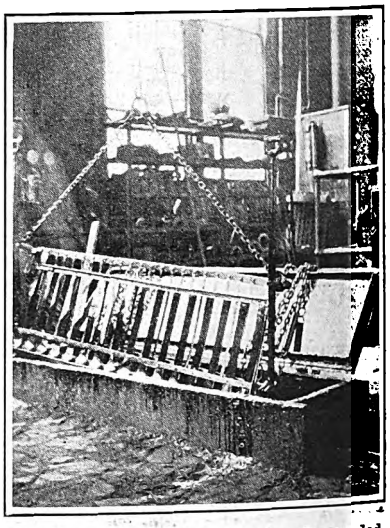
Railway	Average Miles per Pull-In	Railway	Average Miles per Pull-In
New Orleans	181,021	Little Rock	14,683
Nashville	91,787	Birmingham	14,605
Knoxville	37,734	Texas Electric	13,734
Covington, Ky.	31,282	Mobile	12,331
Memphis	18,265	Dallas	9,963
Atlanta	17,717	Chattanooga	4,720

The lowest total maintenance cost for the month was made at Little Rock. Figures for the various accounts for March and for the year to date as compared with the same period during 1924 are given in an accompanying table.

Another table gives the average miles per pull-in for the month of April for the various cities. The list of troubles which have caused most frequent pull-ins shows that these include armatures, brushes, brush yokes and brush-holders, fields, controllers, rheostats, brakes and brake rigging.

Dipping Tank Speeds Up Fender Painting

IN THE Homewood shops of the Pittsburgh Railways a dipping tank has recently been installed to facilitate the painting of certain classes of material. Any small part to be painted black is dipped in this tank. Its primary use, however, is for fenders.



Counterweight Holds Fender Suspended About the Dipping Tank

Doing fender painting by hand, a skilled man could do about two per hour. By dipping a speed of about 24 per hour can be obtained when necessary, although this is not desired under ordinary circumstances.

MAINTENANCE COST IN CENTS PER 1,000 CAR-MILES

FOR CARS AND EQUIPMENT IN LITTLE ROCK FOR MONTH OF MARCH, 1925, AND FOR YEAR TO DATE COMPARED WITH SAME PERIOD OF PREVIOUS YEAR

Account	1925 March	1925 Year to date	1924 March	1924 Year to date
Superintendence of equipment	1.79	1.90	1.91	1.92
Passenger and combination cars	5.59	10.26	10.43	13.47
Service equipment	.09	.12	.39	.38
Electrical equipment of cars	4.46	5.10	6.81	7.21
Shop equipment and tools	.56	.38	.52	.24
Shop expenses	.99	1.06	.98	1.73
Total maintenance	17.48	18.82	20.84	24.95

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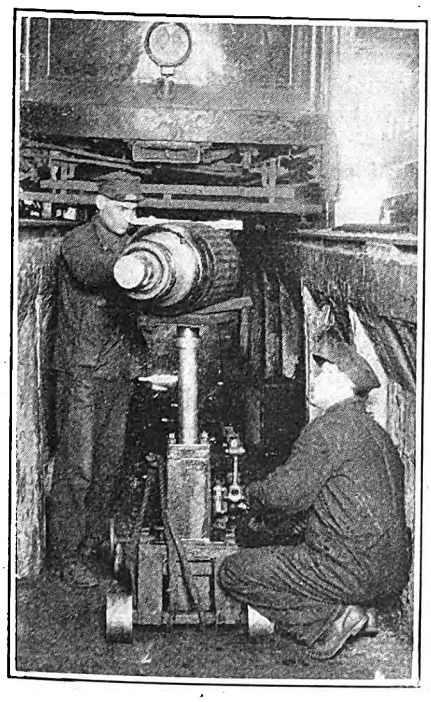
The dimensions of the tank are approximately as follows: Length, 6 ft., width 20 in., depth 5 ft. Its location is in the blacksmith shop alongside the bench where the fenders are repaired. A pulley has been arranged with a counterweight equal to the weight of a fender. The latter is hooked on to the pulley, dropped down into the paint tank, then raised and allowed to drip for an hour. Repairs to a fender take about an hour on the average, and the next can thus be repaired while one fender is dripping.

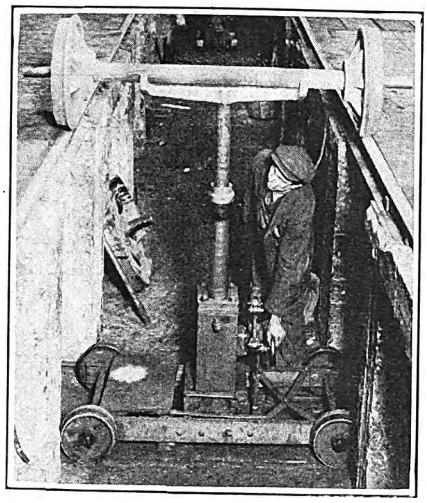
Handy Attachments for Pit Jacks

WHERE pit jacks are used for handling underbody equipment, wheels, motors, etc., special arms and tops save time and labor and also make the handling operation much safer for workmen. The accompanying illustrations show two special top fixtures as used in the 155th Street shops of the Eighth Avenue Railroad, New York City, with Watson & Stillman jacks.

For handling wheels an upright extension is clamped to the top of the plunger. This has extension arms at the top with V-shaped notches into which an axle fits conveniently. The top arm is 3 ft. broad, permitting the axles to be supported at a sufficient distance from the center, so that danger of tipping and dropping is avoided. In handling armatures, a steel plate with



Handling an Armature with a Pit Hoist and Special Padded Plate.



An Extension Arm Fitted to the Top Plunger of the Hoist Insures Safety in Handling Wheels

felt pad is arranged to fit on top of the hoist plunger. This provides a convenient support for armatures and at the same time insures them against damage.

Softening Fiber for Convenient Working

IN MAKING fiber washers for the end insulation of governor coils in the shops of the New York & Queens County Railway, it has been found necessary to soften the fiber for convenient working. The washers are cut from $\frac{3}{16}$ in. fiber by using a special extension bit, with two cutting extensions, one to cut the outside while the other makes the hole. Where fiber is used in its usual form, it is so hard that continual sharpening of the bit is necessary and as a result accurate work is made difficult.

The practice followed in the Woodside shops of the New York & Queens County Railway is to soak a sheet of fiber in water until it is soft. The washers can then be cut out very easily. These are then dried under pressure by assembling a quantity of washers on a bolt with steel washers at either end. One washer is placed under the head of the bolt and another washer underneath the nut. By tightening down on the nut sufficient pressure is obtained to squeeze out water and the assembled washers are then dried out in a baking oven. The nut on the end of the bolt is screwed down several times as the washers are dried out. This method insures that the washers are perfectly flat when finished and the pressure which is put on them makes them very hard.

Double Boiler Used for Heating Pinions

CARE is taken in the installation of pinions at the Utica Park shops of the New York State Railways to make certain that they are well seated and that no damage results to the shaft or pinion bore while they are being put on. Prior to being installed all pinions are heated for fifteen minutes in boiling oil at a temperature of about 212 deg. F. When heated the pinions are taken out and installed quickly before they have a chance to cool. The pinion is tapped into position with a heavy piece of wood held between the pinion and the hammer, not to get a driving fit but to be sure that the pinion is well seated. The pinion nut with its lock washer can then be screwed tight. The oil which is retained prevents rusting.

The accompanying illustration shows the type of heater used, which is essentially a double boiler made of sheet steel. The inner portion has handles so that it can be lifted out. The outside casing is 2 ft. x 2 ft. 6 in. x 2 ft. high. Four electric heating coils are installed at the bottom between the two cases. These are in circuit on the 550-volt shop circuit. The resistance tubes are installed on a cradle, which keeps them free from touching either the bottom or the upper container. A cradle inside the inner section keeps the pinions from touching the bottom or sides while heating. Ordinary machine oil is used and the amount is just sufficient to cover the pinion thoroughly. The hinged cover can be closed down and all heat retained.

Double Boiler Used to Heat Pinions in Oil at Utica Park Shops

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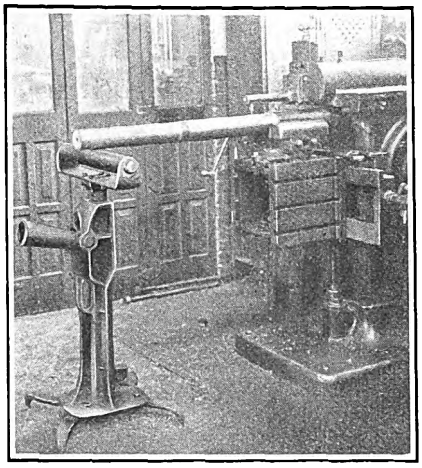
Roller Top for Jack

FOR drilling long plates on a drill press or machining long parts in a shaper, it is necessary to have some form of rest for the end of the material that is not supported by the shop tool. Frequently, the work requires moving back and forth for various operations. A support with a roller and adjustable for height has been found particularly convenient in the Utica Park shops of the New York State Railways, Utica Lines. The illustration shows how a roller top and a special base to prevent slipping have been attached to a Simplex jack in the shop. The roller top is arranged to bolt directly to the standard head of the jack. The roller has a diameter of 2½ in. and is about 2 ft. long. A flat plate bent at the end serves for the bearings of the roller, and for bolting to the jack.



Jacks Provided with Roller Top and Pointed Feet for Use in Supporting Long Material During Machining

In order to prevent slipping on the floor, a base having four legs with sharp points is bolted directly to the base of the jack. When once placed in position the support cannot be shifted by the pressure of the work on the roller.

New Equipment Available

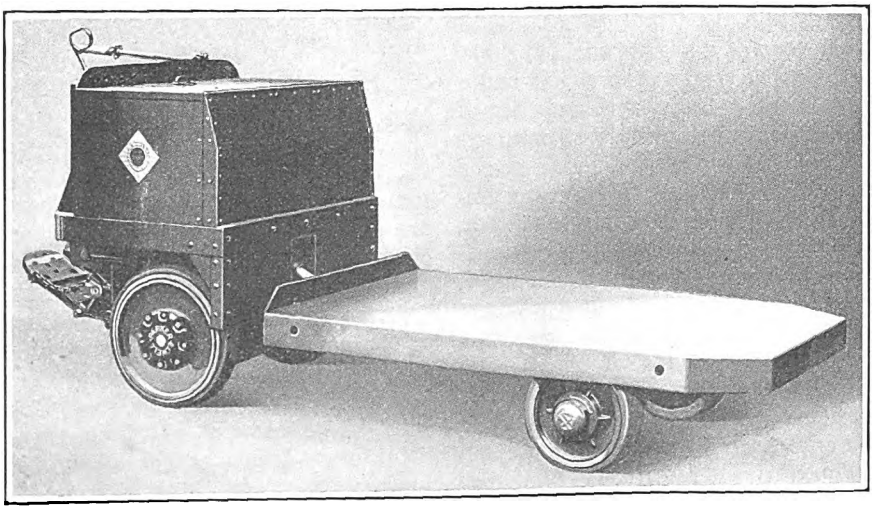
Electric Lift Trucks

A NEW design of electric lift truck, arranged particularly for use in electric railway storage yards, has been brought out by the Elwell-Parker Company, Cleveland, Ohio. This haulage unit is of 30-in. gage for both front and rear wheels, which is broader gage than the types designed particularly for inside operation. The driving wheels are 22 in. and the front wheels 15 in. in diameter, and either 3½ or 4-in. tread can be furnished. Drive wheels are fitted with a double row of ball bearings, weighing 13 lb. each. Radial thrust bearings measuring 7 in. outside diameter are used.

The wheels are carried on drop forged knuckles with drop forged levers pressed upon tapered serrations. The knuckles support the weight of the axle, frame and load on a steel ball bearing recessed in a cup at the ends. Levers are fitted with ball ends to fit the steering rod sockets. All rods are placed high beneath the platform to avoid contact and interference with obstructions. Full floating alloy steel drive shafts are pressed into drop-forged clutch plates, which are bolted to the outside of the drive wheels. These shafts are fitted with chrome-vanadium universal joints and engage the splines of the differential.

The differential carries a special Brown & Sharpe phosphor bronze worm wheel. This is lock-bolted between the two halves of the drop forged differential cage. A multi-thread steel worm on radial and thrust bearings is assembled with the differential. A new type of universal joint inside the brake wheel connects the drive worm to the motor shaft. The motor has a demountable armature and is fitted with ball bearings.

The tractor platform is 40 in. wide and 72 in. long and is formed from a single steel plate with deep side flanges. The platform nose is tapered to aid its insertion beneath a skid even though approached from an angle. The lift of the platform is 6½ in. It is 1 in. high when in low position and 23½ in. when raised. This construction provides increased underneath clearances over other types, which is an important factor when traveling over rough surfaces, such as are common in storage yards.



New Type Electric Lift Tractor

Free-Handle Circuit Breakers

NON-CLOSABLE on overload is a feature of a new type circuit breaker now being offered to the market by the Roller-Smith Company, New York, N. Y. Sturdiness and simplicity have received special attention. The non-closable on overload feature can be supplied on any of the standard type circuit breakers furnished by this company, irrespective of current voltage, style of trip, or number of poles.

In this new device a circuit breaker is provided which cannot be closed or held in on overload, even though the operator's hand is on the handle. This new design of free-handle circuit breaker differs from the regular plain overload breaker mainly in the construction of the handle lever and the tripping lever. The handle lever roller is mounted on a triangular casting pivoted to a shaft. A second member of the handle lever pivots to the first and carries a latch. On pulling down the handle in the usual manner, the roller functions to close the breaker in the ordinary way. If the latch moves backward, as occurs when the overload armature operates, the breaker will open, while the main part of the handle still remains in the down position.

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The News of the Industry

Wage Agreement Renewed in New York State

The existing wage and working agreement between the New York State Railways and its employees in Rochester, Syracuse and Utica will remain in effect until May 1, 1926. This was determined on May 20 at a second referendum taken by members of the Rochester union, who previously had rejected renewal by a large majority. The second ballotting resulted, according to unofficial count, in a tie, 274 to 274, but under the system of pooling the votes of the three cities the margins given the renewal in Syracuse and Utica in the first pool hold over, insuring the continuation of the agreement by a majority of 276 votes. Only Rochester members took part in the second vote.

The present wage scale calls for a maximum of 55 cents an hour for two-man car operators, with 5 cents an hour additional for one-man car workers and 2 cents additional for the men on interurban lines.

During the conferences prior to the referendum James F. Hamilton, president of the New York State Railways, promised the union officials that he would co-operate with them in their efforts to induce all employees of the company to become affiliated with the union. He made it plain, however, that there would be no coercion on the part of the traction company toward this end.

Decline in Traffic Alarming in Cincinnati

Unless there is a betterment of business during the remainder of the year, as compared with the first three months, the Cincinnati Traction Company, Cincinnati, Ohio, will carry in 1925 about 95,000,000 passengers, instead of 103,000,000, the number figured in the company's budget. Based on a 10-cent fare this difference of 8,000,000 would mean $800,000 less revenue than had been estimated. The figures on file for the three months of this year compared with a similar period of last year show a decline of 2,139,599 revenue passengers. By months the figures are:

	1925	1924
January	8,436,794	8,967,180
February	7,677,361	8,549,249
March	8,295,326	9,032,651
Total	24,409,481	26,549,080

The causes of the decline are classified as follows: Industrial, including unemployment or part time, lower wages, high rents and consequent concentration of population in congested districts of cities; increased patronage and competition of buses; greater use of the individual and group-carrying automobile; the radio keeping thousands of persons in their homes who formerly went out for entertainment; the erection of movie theaters in smaller community centers in a city, thus permitting patrons to reach them on foot instead of using vehicular transit downtown and high street car fare.

It is the bus situation that is causing most concern. One expert in Cincinnati estimates that buses are now carrying daily 20,000 revenue passengers. Others do not estimate the number above 15,000 daily, but even these admit that the number of passengers being transported by bus is increasing.

Urban transportation experts, including the Technical Advisory Corporation, which some months ago rendered a report to the City Planning Commission, say Mount Washington, Silverton and Mount Healthy are entitled to transit and that it is the true rôle of the bus to render service to these and other similar places. Buses, they say, could operate from these localities to the present end of the railway and connect communities like Hartwell and Mount Healthy.

Urban Transit Must Be Centralized

Review by Head of Department of Detroit Railways Shows Autos Run for Hire Over Fixed Routes Handle 40,000,000 Passengers—Plea Made to Council for Definite Policy

ROSS SCHRAM, general manager of the Department of Street Railways at Detroit, Mich., says that to keep a low, universal fare, frequency of trade and a high riding habit, urban transportation must be centralized. In replying to a request from the Council to supply it with a general observation of the miscellaneous automotive transportation furnished in the city, he says that there are now operating in the Detroit district, either wholly or in part, more than 800 passenger-carrying buses. This includes 244 vehicles of the Detroit Motor Bus Company. Included in this total are approximately 150 buses owned and operated by individuals on spasmodic schedules and indefinite routes.

More that 925 jitneys operate in the same district. Mr. Schram says there is a very meager record of the ownership, operation and routing of both buses and jitneys other than those of the Detroit Motor Bus Company and two or three of the older and more stable interurban bus companies.

Not only is there a lack of records but also a lack of adequate supervision of this traffic as regards routes, schedules, law observance, liability and safety of equipment. Many of the buses which operate under state permits are doing a local business inside the city. At the present time the buses are said to be transporting passengers at a rate which will total between 35,000,000 and 40,000,000 people a year.

The jitneys are operating at the present time at a rate of approximately 8,000,000 to 10,000,000 passengers a year, depending upon weather conditions. These figures do not include upward of 6,000,000 passengers a year carried on the D.S.R. feeder bus lines. All of this transportation is on a 10-cent fare or better.

The Detroit Motor Bus Company, during 1924, carried 29,518,722 passengers, using 199 vehicles. The Detroit United Railway, since the advent of the new year, has been transferring its passengers on Gratiot, Grand River and Fort Streets by its own buses, but is not doing a local business except in occasional instances. Of the passengers detraining at the railway terminals, approximately 50 per cent are using D.S.R. service rather than D.U.R. coaches, according to Mr. Schram. If this ratio is maintained, the Department is better off financially than were it to receive the track rental for the continuation of the D.U.R. trolley cars down town. He says in part:

> Inasmuch as the average increase in revenue riders on the trolley lines of this city for the past ten years has been 15,000,000 a year, it is very apparent that the continued decentralizing of transportation, at the same time the city is spreading out and the length of haul is increasing, must result in a higher fare for the trolley car riders.
>
> Not only should an effort be made to centralize the volume of traffic to protect the car fare of the family of moderate means but extraordinary effort should be made to build it up on city-owned agencies to permit it to be thrown intelligently to the support of rapid transit. If this is not done the 32 per cent of the rapid transit cost which its riders must pay will create a prohibitive rate of fare. Rapid transit fare in Detroit must be low, because for a long time the average haul will not be long enough to attract patronage merely because of time saving.

Mr. Schram says that whenever the Council so desires his department is prepared to show the traffic on the streets and the increased running time were the city to substitute 100 per cent bus operation for trolley operation. Of the Jefferson Avenue situation, with service by trolleys, buses and jitneys not co-ordinated, he says it is absolute transportation waste, especially when the city is thinking of supporting rapid transit. Mr. Schram says further:

> To keep a low universal fare, frequency of trade and a high riding habit, urban transportation must be centralized. There must always be a sufficient surplus to permit of service to the outlying districts before they have sufficient traffic to meet the cost of that service. This is a particularly important thought in connection with the vast annexation which has taken place in this city.
>
> While this miscellaneous bus and jitney

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transportation has been growing up, absorbing part of the possible financial returns for the centralized transportation organization, the city railway department has been putting in some 42 miles of feeder bus routes, at a deficit to itself. There is a great deal more of this pioneering service which we are ready to develop, and for that reason we are rather anxious to understand what control your honorable body will assume over the miscellaneous smaller systems being developed at the expense of the outlying residents and the riders who cannot afford a higher fare. Our plans for major type bus operation are being studied constantly, but we felt that it would be advisable to withhold final decision until we had some expression from your body as to the possible procedure in connection with rapid transit development. If it is planned to go ahead on a large scale with rapid transit there is a question of the advisability of investing in a great bus operation to take much needed patronage away from the tubes.

If rapid transit is going to be limited to one or two routes, then we believe we would plan bus operation co-ordinated with trolley service, using the trolley for local and the bus for express, or the other way about. It is our opinion that this development in transportation is coming. It has been held up because in most cities there was or could be no common ownership of trolleys and buses.

In the matter of bus and jitney regulation, there are legal points upon which you will undoubtedly desire advice from the Corporation Counsel. If you desire definite recommendations, we will report further.

In closing, Mr. Schram reiterates that in fixing future policy the rate of fare, be it subway, bus or trolley, should be the starting and finishing point. He says the plans for transportation relief are easily developed, but that the sustaining patronage is not. His closing remark was that 85 per cent of the travelers use the street cars, mostly because of the low rate of fare.

Men at Altoona Pay Tribute to Management

A remarkable tribute was recently paid to Scott S. Crane, vice-president of the Altoona & Logan Valley Electric Railway, Altoona, Pa., by the men who have worked under him. When news of the purchase of the road by A. E. Fitkin & Company, New York, became public, the members of the local union remembered the cordial relations which Mr. Crane had always fostered between management and men, and they felt that the time had arrived for an expression of their appreciation.

This expression took the form of a resolution sent to the new owners, in which the men expressed their wish that he be continued in office. In part it follows:

His daily association with employees, his personal interests in those things which have meant better working conditions, his good, fatherly advice, given gladly and freely, to all who seek him, and it being apparent that his every effort is intended to solidify and strengthen the kindly feeling between employer and employee; his unswerving attention to duty, his undoubted honesty and integrity, have so linked him to the organization that we are impelled in fairness to him, and seeing also a continued benefit to ourselves and the organization voluntarily to recommend and indorse our friend, our adviser, our protector, our general manager for continuation in the office he has filled so well and so honorably during all these years.

The new owners in a letter from T. R. Crumler, president of the General Engineering & Management Company, expressed their gratification at this display of loyalty and appreciation and announced Mr. Crane's advancement to the position of vice-president in charge of operations. The letter assured the employees that the management was greatly interested in having "Mr. Crane continue the excellent work that he has carried on for so many years and in which you have assisted him by close co-operation and faithful service."

Preparations for Boston Arbitration Under Way

Trustees of the Boston Elevated Railway have selected Roland W. Boyden, Boston attorney, to represent them in pending arbitration proceedings with the carmen. This marks a departure in annals of local railway arbitration. By choosing an arbiter with no affiliation with the road or its management, the Elevated has taken the first step to "neutralize" the entire membership of the board. Heretofore, only one of the three members was neutral, the two others being closely identified with the parties to the arbitration.

The agreement between the company and its men expires on June 30. The contract now in force was negotiated last year. Judge John D. McLaughlin was the neutral arbiter. His award called for a 2½-cent increase in the hourly wage to 72½ cents, or an additional wage expense of $500,000 a year.

No Constructive Action at Rockford

Mayor Hallstrom of Rockford, Ill., has vetoed the ordinance to the Rockford City Traction Company, passed by the outgoing City Council as its last act. The veto was delivered to the new Council after Col. Arthur E. Fisher, counsel for the traction company, had written a letter to the Mayor offering to change the wording of the franchise to specify 100-lb. T-rails and also to pave wherever necessary instead of the specification "to keep pace with the city's improvement program."

On the other hand, Council members composing a transportation committee, which has been considering merits of the proposal which had municipal ownership as an ultimate goal have recommended "no action" on its franchise. At the same time W. C. Sparks, manager of the Rockford Traction Company, and A. D. Mackie, general utility manager of the holding company, are reported to have gained important concessions on the sections opposed by Mayor J. Herman Hallstrom.

Subway on San Francisco Waterfront a Relief

A new subway at the foot of Market Street, San Francisco, and at its intersection with the Embarcadero was put in operation on May 2. The general contract for the construction work was let to the Tibbitts-Pacific Company on Nov. 1, 1923, the Market Street and the Municipal Railways each being assessed 12½ per cent of the cost. Unusually difficult water-seepage conditions were encountered. This delayed completion of the project, set for Aug. 31, 1924.

The subway is 986 ft. long. It consists of two open sections, of equal length, and a closed section 390 ft. long. The structure is 23 ft. wide and 13 ft. high, with approach grades of 3.75 per cent. It will be used entirely by vehicular traffic, all of which will be deflected underground, thereby permitting the free movement of street railway cars and pedestrians on the thoroughfare above. At this point on the Embarcadero the movement of vehicles averages 800 an hour between 7 a.m. and 5 p.m. This has caused a stoppage of street-car movement for more than 40 per cent of the daytime.

Railway Service Restored in Ambridge

Railway service was resumed in Ambridge, Pa., on May 1 by the Pittsburgh & Beaver Street Railway following a suspension of two weeks. Operation was not resumed, however, until after the Borough of Ambridge had rescinded its former order turning down the company's proposition for the reconstruction of track in Ambridge and ordering the company to cease operations in the borough. The day following the cessation of service the Beaver Valley Motor Coach Company, an affiliated company, started a twenty-minute coach service through the Boroughs of Ambridge and Leetsdale to Sewickley.

The fight in Ambridge dates back two years. The company refused to participate in a paving program which would have cost it about $170,000. It contended that this was unduly burdensome. Conference, compromise and further contention followed until endless litigation involving not only the Pittsburgh & Beaver Street Railway but also the Beaver Valley Traction and the Philadelphia Company, the holding company for both companies, brought the issue to a lower court and then to the Supreme Court. Both courts concurred in the opinion that if the Beaver & Pittsburgh Street Railway did not comply with the requirements the borough should order operations discontinued and proceed with its paving program.

Bids were to be opened on March 16, but a committee of citizens interceded and conferred with the company, stating that in their opinion the Council would agree to a single track and that the borough would stand the cost of paving between the rails and maintaining it. Although the company was prepared to abandon the road it finally made such an offer to the Council. This was turned down, and a counter proposal was made similar to that submitted by the company but that a rental of $100 per 1,000 population should be paid in lieu of paving relief. A new proposal was made whereby the company agreed to pay a rental charge of $1,200 a year if it were earned and if the company could first pay the interest on its bonds. Under this arrangement the railway was to increase the rental as traffic increases. The borough turned this down. It declared that it wanted its rental to be a charge against earnings ranking ahead of bond interest.

The company had never withdrawn its proposition and when it received notification of the final action taken by the borough it arranged for the resumption of service on May 1.

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Atlanta Employees Receive Increase of 3 Cents an Hour

Wage increases to employees of the railway department of the Georgia Railway & Power Company amounting to approximately $126,000 a year were awarded May 14 by the board of arbiters.

The increase which was decided upon is 3 cents an hour for motormen and conductors on the railway and 6 per cent on present wages to other members of the union employed by the company. The new scale of wage is to be effective as of May 1, last, and is to continue in effect through Dec. 31, 1925, or as long thereafter as may be mutually agreeable to the company and the union. Notice in writing may, however, be given by either side at least ten days in advance of a desire to negotiate a new wage scale after Dec. 31, 1925.

The new scale is as follows: First nine months of service, 46 cents an hour; second nine months of service, 51 cents an hour, and thereafter, 54 cents an hour.

The former scale was: First nine months of service, 43 cents an hour; second nine months of service, 48 cents an hour, and thereafter, 51 cents an hour.

Two of the three members on the board voted for the increase. The third member, C. Murphey Candler, representing the power company on the arbitration board, filed a dissenting opinion.

In his dissenting opinion, Mr. Candler pointed out that only three cities in the South were paying higher wages than Atlanta, and that the street railway had received approximately 600 applications for work during the past year at prevailing wages, only 80 per cent of which could be filled. The increased cost of living in Atlanta was given by Edwin F. Johnson, the umpire on the arbitration board, as the reason for his voting in favor of an increase in wages.

After the board had rendered its decision Preston S. Arkwright, president of the Georgia Railway & Power Company, issued a formal statement expressing disappointment at the increased expense placed on the company, but making it clear that the company did not grumble at the wage increase. He said he only wished that there was somebody with the power and willingness to award the street railway itself a living wage in the interest of the men and the town.

A Duke Rumor Denied

James B. Duke has taken occasion vigorously to refute reports that he has been buying the stock of the Norfolk & Southern Railroad for purposes of control. He said:

> I do not own and never have owned a share of stock in the Norfolk & Southern Railroad, and have not ridden on any part of the railroad during the last twenty years. There exists no basis whatever for any such rumors or statements.

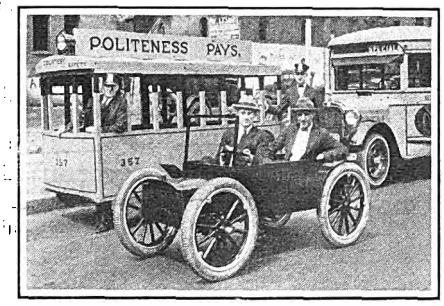
Gossip had it that an extension of Piedmont & Northern was planned to cut the state in half with an electric line through the industrial section and provide easy transit to and from the university Mr. Duke is building at Durham. Said rumor:

> The territory would provide a growing stream of freight traffic. With the Dukes in control of Norfolk Southern it would be easy to electrify the road and fit it in with the Piedmont & Northern.

The only trouble is that Mr. Duke doesn't see it that way—not at present, at least.

Politeness Emphasized in Detroit Safety Parade

Trust the Department of Street Railways at Detroit to do something original whenever the occasion demands. Safety week at Detroit, which opened on Sunday, April 26, saw the department all set. Its exhibit did, in fact, comprise a most imposing division, with trolley cars, motor coaches and the latest type of snow-fighting equipment, decorated with banners setting forth safety slogans. All these were supplemented with the department band and a platoon of trainmen, natty in appearance and snappy in bearing, evidence that the day of the unkempt platform man has passed into the limbo of things forgotten.



The "You First, Alphonse" Twins

There was, of course, the usual parade, with attractive floats representing city departments and civic and industrial organizations. Neighboring suburban towns participated.

The outstanding feature of this division, however, was the absence of the time-worn wrecked trolley car and automobile. These were replaced by a diminutive trolley car and auto, each propelled by the foot-power of two men who rode inside each vehicle.

While passing down the avenue these equipages alternated in getting into each other's way, and just when a collision seemed inevitable each would stop, driver and motorman alight and, with smile and bow, surrender the right-of-way in turn, to show that politeness, rather than insistence upon constitutional rights, was a powerful factor in averting accidents.

The contention of the Department of Street Railways was that there was nothing constructive in showing the effect of carelessness in the form of a wrecked auto or trolley. It was felt, however, that education along lines of safety could be better demonstrated by illustrating how accidents could be avoided. That this theory was correct was proved by the many favorable comments and hearty applause along the line of march.

Panic Follows Short Circuit in Interborough Subway

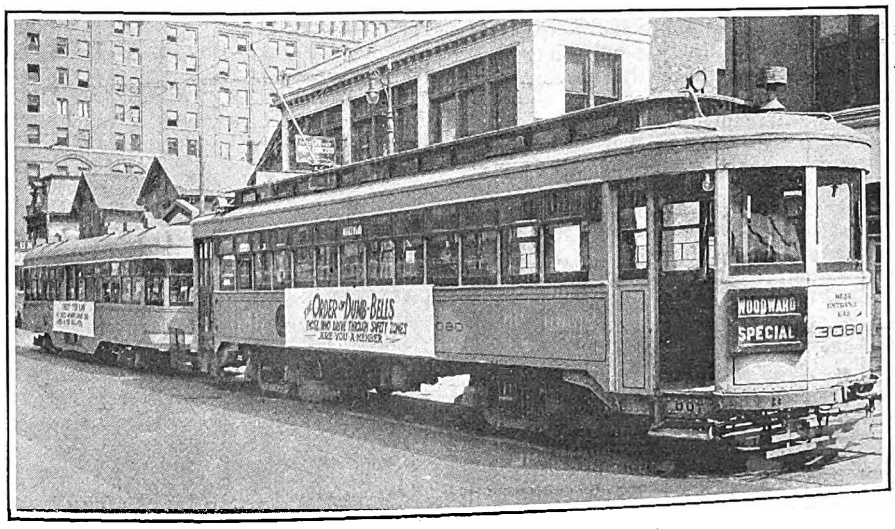
More than 100 persons were injured on May 19 in a panic that followed the short-circuiting of a car in a City Hall local on the Lexington Avenue subway of the Interborough Rapid Transit Company, New York, a train's length south of the Grand Central station.

The train developed a short circuit accompanied by the usual loud report and flash. The circuit breakers in the substation tripped immediately and cut off the current.

The short circuit occurred at 9:03 a.m. and the power was off from that moment until approximately 9:40 a.m., having been shut off from both the local and express tracks in order to prevent any possible danger from the third rail to passengers walking in the tunnel.

The car in which the accident occurred—No. 4,292—was a trail car, without motors. It had been thoroughly overhauled in the general repair shop at 148th Street on Feb. 24, 1925, and all cables and electrical apparatus subjected to a high voltage test and found to test clear. The day before the accident this same car was inspected and the mechanical and electrical apparatus adjusted in the temporary inspection sheds at Whitlock Avenue.

The cause of the short circuit is not known, but an investigation is being conducted by the railroad, the Transit Commission, the Fire Department and other authorities.



Placards on Cars at Detroit Preached Safety

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Recent Bus Developments

Definite Statement of Boston & Maine's Bus Policy — Governor of Michigan Vetoes Bus Bill—Other News

PLANS are announced by the Boston & Maine Railroad for the bus operation it purposes to substitute for railroad service in Massachusetts and New Hampshire. Routes for about 100 miles for buses and motor trucks have been outlined by the company. Bus and truck lines will be established by the Boston & Maine Transportation Company, acting as an automotive auxiliary to the rail system, for those communities where any new service is warranted. The list of lines on which petitions are now pending for a bus service includes the Newburyport, South Reading, North Weare and New Boston, Wilton-Keene and Bethlehem branches.

The company states that on some of these branch lines local interests have announced their intention to operate independent bus and truck routes, either for hire or to care for the transportation needs of their own industries. As the institution of motor operations by the Boston & Maine Transportation Company on these branch lines is proposed solely to see that the communities are served, it is not planned to operate generally in competition with such independent services.

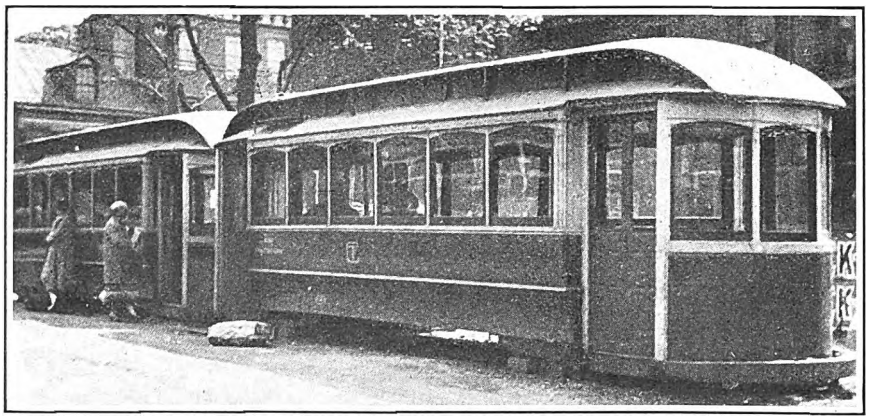
In Portsmouth, N. H., the Boston & Maine Transportation Company has started a bus line of seven coaches with service to North Beach and Cable Road, as well as other sections of the city where electric railway service has been in operation. Four of the buses are in green and gold with seats of Spanish leather and semi-balloon tires. They are of White construction, seating 25 passengers each. Three of the buses, seating 21 passengers each, are of the Brockway type with similar color scheme.

In a statement the company said in part as follows:

> These motor bus and motor truck lines will be established with a view to increasing their usefulness and to promoting permanency, because they must be self-supporting to continue. While the changes will involve some inconvenience, they will also effect some appreciable betterments in service and economies in operating costs. Studies indicate that in a number of places there will be, under motorized operation on the highways, a considerable improvement over steam operations by rail. All motor bus and motor truck routes will connect with railroad lines.

The Twin City Rapid Transit Company, Minneapolis, Minn., has applied to the State Railroad and Warehouse Commission for four bus route permits —one 16-mile line to White Bear Lake, St. Paul's summer resort; one to Minnetonka, Minneapolis' summer resort, and two lines in North Minneapolis. Suburban electric railway lines of the company already serve the resort districts, but the buses will be used to supplement them. Other bus lines will operate from St. Paul to Minneapolis.

Old trolley cars have in the past been used for bungalows and for restaurants, but the Trenton & Mercer County Traction Corporation, Trenton, N. J., has apparently hit upon a new use for some of its obsolete cars. Pending the construction of a terminal on the vacant lot on Perry Street near the heart of the city, that property is being used as parking space for the buses of the Central Transportation Company, a subsidiary, and two old trolleys with trucks removed have been converted into a waiting room divided into two parts, one for men and the other for women. The station is lighted and heated by electricity from the trolley wires.



Old Trolley Cars Make Commodious Bus Waiting Room

Bus service from Frankford to Morrisville has been started by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. The Somerton line opened on May 20. These two bus routes are the first steps in a comprehensive plan for bus operation which will become effective gradually throughout the summer.

The Illinois Power & Light Corporation has announced that it will not act upon the state authority to suspend service on New Street, Church to Green Street, and on Green Street from New Street to Prospect Avenue, Champaign, Ill., until the city begins repaving those thoroughfares. Buses will replace the cars.

Discontinuance of railway service on State Street, San Diego, Cal., between Broadway and Ivy Streets by the San Diego Electric Railway, in conformity with the recommendation of the City Council, and the substitution of motor coach service have been authorized by the Railroad Commission.

The Des Moines & Central Iowa Company has been authorized to operate a bus line between Des Moines and Newton, Iowa. The Des Moines City Council acted formally to approve the routes through the city.

The Tennessee Railroad and Public Utilities Commission recently asked the state's Attorney-General if the commission could regulate buses. The request was made after the Tennessee Electric & Power Company had asked the commission to approve a franchise for the company to operate a bus line between Chattanooga and Mission Ridge. The company was granted the franchise by the city of Chattanooga and the county of Hamilton, but had also to apply to the commission under the public utilities law. During the last Legislature a bill was defeated which would have placed buses under the jurisdiction of the commission. Since that time it has been declared that the commission has the power to regulate buses under the provisions of amendments to the railroad commission act enacted in the Legislature of 1915. It is this point which the commission wishes to have Attorney-General Thompson clear up.

Governor Groesbeck of Michigan has vetoed a bill passed by the Legislature which would have allowed electric railways to operate bus lines supplemental to their existing lines or in lieu of such lines between cities and villages already served, without being required to secure permits based on necessity and convenience. Local consent to the change or extension only would have had to be secured. The Governor stated that neither this bill nor the present statute adequately protects the public in the matter of common carriers. A more comprehensive plan of controlling their operation must be devised, he said.

The City Council of Canton, Ohio, has authorized the abandonment of a spur car line in Belden Avenue and the removal of the tracks. Officials of the Northern Ohio Traction & Light Company said that bus service would be operated through this territory.

Another instance of a refusal on the part of the commission to grant a petition for a bus line because it conflicted with adequate service supplied by electric railway lines was noted recently in the State of Utah. The petition of Wilford Baugh and I. B. Glenn for permission to operate a bus between Wellsville and Richmond in Cache County was denied by the Public Utilities Commission on the ground that the present service offered by the Utah-Idaho Central Railroad of Ogden and the Oregon Short Line Railroad of Yakima, Wash., between the same points was adequate and accommodated nearly all the people who would be served by the bus line. The commission found that in one section where the railroad service was not so convenient to the residences as the bus line a majority of the residents had automobiles.

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A new through de luxe stage service was started on May 18 by the Portland-Seattle Stage Company between Seattle and Portland and between Seattle and Vancouver, B. C., by the Seattle-Vancouver Stage line. Announcement of the service was made by W. H. Somers, traffic manager for the Puget Sound Power & Light Company. The distance covered in the run from Seattle to Portland is 205 miles and from Seattle to Vancouver 165 miles. All equipment was specially designed and built for this service.

Election results at Denver on May 19 show that the proposed franchise for the Denver Tramway to operate buses was rejected. The franchise was asked in the name of the Bus Tansportation Company, organized by the trolley company. It was planned to use ten buses at the beginning with a 10-cent fare, as compared to the 7½-cent fare on the trolleys. Transfer from one bus line to another was provided. The bus routes were intended to cover outlying districts.

The Morris County Traction Company, Morristown, N. J., has purchased the bus lines formerly operated by Arendasky Brothers of Netcong, N. J. These lines connect with the railway at Landing and run to Netcong and Stanhope, a distance of 4 miles. In addition to this the railway will start a new line to run from its terminal at Landing to Bertrand Island, a distance of about 2 miles. This will be a summer service to start Decoration Day.

First steps to operate a network of bus lines radiating from Syracuse have been taken by the Mid-state Coach Lines, controlled by four electric railways, in petitions filed with the Syracuse Council for a line between Syracuse and Auburn. The petition was presented by T. C. Cherry, president of the coach company and also head of the Rochester & Syracuse Railway. Mr. Cherry said that his bus concern eventually would operate from Syracuse in all directions. Applications for franchises to operate in the cities of Oswego and Auburn have already been filed. The Mid-state Coach Lines expect ultimately to extend its Syracuse-Auburn line to Rochester.

The Black River Traction Company recently petitioned the City Council of Watertown, N. Y., for the privilege of discontinuing its electric railway from State Street over High, Factory and Pearl Streets. At the same time the Watertown Transportation Company, which operates Watertown city bus routes, requested the city to grant it the right to operate buses over these routes. The traction company explained that the line did not pay cost of operation. It offered to give to the city the rails rather than pay for tearing them up. Officials of both companies say they have under consideration a plan for the issuing of transfers from trolley cars to buses and vice versa. The transportation company is controlled by officers of the traction company and this move is regarded as the forerunner of a program of expansion of the bus lines in the city.

Fare Changes Sought on Georgia Interurban

Petition for a revision of fares between Atlanta and Marietta, Ga., was filed recently with the Georgia Public Service Commission by the Atlanta Northern Railway.

The petition seeks to adjust rates on the basis of a 7-cent zone instead of the 6-cent zone, with the purpose in view of producing a net annual earning of $64,000 for the company—a sum agreed upon by its officials and a committee of its patrons as being a fair return upon the value of the property employed and cost of service rendered.

The 7-cent zone rate, the petition sets out, is a compromise fare, fixed tentatively by agreement between the company and its patrons with the understanding that if, after six months trial, it should fail to produce earnings at the rate of $64,000 a year, the fare would be subject to further revision by the Public Service Commission.

The average rate of increase would be slightly less than 15-100 of a cent per mile as applied to the 54-ticket commutation books in general use by the regular customers of the line, if the schedule in the petition is adopted.

The Atlanta Northern Railway, it will be remembered, recently forced the elimination of unfair bus and jitney competition by discontinuing its service to Marietta and dismantling a part of its line. The increase in fares asked is a measure attempting to put the interurban line back upon its feet. It has been a losing proposition for years.

Humorous Tone in Interborough Fare Plea

Notice was filed by the Interborough Rapid Transit Company on May 15 with the Transit Commission that the expenditure of $20,000,000 for lengthening subway platforms cannot be undertaken unless the subway fare is raised to 7 cents. The tone of the communication was most unusual. Packed away in it was a smile. It will well repay anyone's rereading. The Interborough brief states:

> Everybody in office and everybody who hopes to get into office is for the continuance of the 5-cent fare. Mayor Hylan hopes to be re-elected because he is for a 5-cent fare. His opponents hope to defeat him because they are for the 5-cent fare. The Transit Commission has been against any increase in the 5-cent fare since the day it took office. So has the Board of Transportation. It has been said that the 5-cent fare, having been written into the contract, has passed out of the realm of discussion. It has become as unchangeable as the law of the Medes and Persians. The president of Columbia University is reported as saying that the 5-cent fare is a political necessity, but an economic impossibility, or words to that effect. It is a grand chorus. Mark Twain might have written it thus: "Stick, brothers, stick. Stick with care. Stick for the sacred 5-cent fare."
>
> Does any one of these proponents of the 5-cent fare believe that if the truth were brought home to these passengers he would escape their just wrath? But the truth is not told. There is a conspiracy of silence. The operating company is blamed for the congestion. It is the scapegoat for the sins of omission of the 5-centers.

George McAneny, chairman of the Transit Commission, stated that his mind "is undeniably made up" that the next measure of relief in the subway —lengthening of the platform stations —must be undertaken. The question at issue, he said, is whether the improvement comes properly within the addition and extension clauses of the dual contracts, and how the financing is to be arranged.

The Corporation Counsel on behalf of the city supported the order for longer platforms, arguing that the added revenue to be obtained by the company would be adequate compensation; that the Interborough is compelled by terms of its contract to make the improvement, and that the financial operations of the company have been profitable.

Charges Slavery in Dayton

Locked out employees of the Dayton Street Railway, Dayton, Ohio, have been operating a bus service in an effort to re-establish themselves in employment. The Dayton Street Railway is opposed to this activity on the part of its former employees and has gone into a court of chancery on a petition for an injunction to restrain the local from operating the bus line. The lower court declined to grant the injunction, and an appeal was taken. This case is yet in the appeal state. The *Motorman and Conductor*, the official paper of the Amalgamated Association, shows its attitude on the issue as follows:

> This situation shows to the extreme what union-smashing employing managements will do, even at the inconvenience of the public, to hold employees in subjection, and this is an illustration of the extreme tyranny of the make-up of the management of the Dayton Street Railway property. The Czar of Russia had nothing on the chief director of this property. Even though slavery, as it existed 70 years ago in our Southern states, was abolished, the spirit of Simon Legree is yet abroad.

Mr. Doherty's Toledo Offer Rejected by City

The railroad committee of the City Council at Toledo, Ohio, has agreed with the members of the street railway board of control in flatly turning down as not feasible the suggested solution of the transit problem of Toledo by turning over to local parties the control of the company provided $1,500,000 in preferred stock of the Community Traction Company were purchased. The Council committee wants to give Henry L. Doherty another chance to bring forth some solution to the problem of better service and lower fares.

The Council of the city now has before it the offer of a complete bus system by the City Wide Coach Company, incorporated here recently by outside interests, to operate on a 5-cent fare if given a 25-year franchise.

Pittsburgh Pass at $1.50

The Pittsburgh Railways will offer to its riders on June 1 a weekly pass at a cost of $1.50 with unlimited riding privileges for 24 hours in the day on all cars in the first fare zone originating in downtown Pittsburgh, Pa., except interurbans. Thomas Fitzgerald, vice-president of the company, in announcing the pass, said it would be placed in effect for an indefinite trial and might be withdrawn at any time. The use of the pass will eliminate the necessity of transfers and will result in a speeding up of car service.

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News Notes

Mansfield Adopts Weekly Pass.—On April 20 the Mansfield lines of the Ohio Public Service Company adopted a new scale of fares, including the weekly pass. The old scale called for 8 cents cash and seven tokens for 50 cents. Under the new scale casual riders pay 10 cents, semi-regular riders use tokens purchased five for 40 cents, and wholesale riders make use of the unlimited ride transferable pass, sold for $1.

Fares Lowered.—In an effort to increase its business and check the inroads of the automobile the Kingston, Portsmouth & Cataraqui Electric Railway has reduced its fare in Kingston, Ont., from 7 cents to 5 cents. No special rate will be given to workmen or children.

New Contract Submitted. — Employees of the Community Traction Company, Toledo, Ohio, have submitted a new contract to Vice-President J. Frank Johnson to replace the one which expires on June 1. No definite details of its provisions have been disclosed. It is understood the men asked for a 10 per cent increase in wages.

Committee to Report Named.—The legislative recess committee of Massachusetts which has been appointed to study the Boston Elevated Railway, and report to the next Legislature on the questions of extended public control of the road, public ownership and the creation of a metropolitan transportation district, is composed of Senators Warren of Arlington, Fish of Brookline and Gifford of Salem, Representatives Shattuck of Boston, Richardson of Malden, Hays of Brighton, Carr of Boston, Schuster of Douglas, Luitweller of Newton, Coyne of Boston and Hickey of Boston. Of these men Senator Warren, Representatives Shattuck, Richardson and Coyne were members of the recess committee of last year which reported on the Elevated, but differed on some of the principal issues so that no legislation could be obtained without further study. The present period of public control of the Boston Elevated Railway can be terminated in 1928, and this is a handicap for the trustees in planning future extensions of the system.

Seeks Higher Fare.—The Fort Smith Light & Traction Company, Fort Smith, Ark., filed with the City Commission recently a petition for an increase in intracity fare from 7 cents to 8 cents and an increase of 5 cents for interurban traffic between Fort Smith and Van Buren. The existing interurban rate is 7 cents.

Letters Commend Trainmen.—How the platform men of the Department of Street Railways, Detroit, Mich., are winning the public favor is shown in a large poster prepared by Ross Schram, general manager. Here are reprinted extracts from letters taken from the mail of one week in which complimentary remarks are written on the work the motormen and conductors are doing toward selling the railway service. The poster is entitled "Keep It Up Fellows!" Mr. Schram says that the management certainly appreciates the attitude of the men, but assures the employees that they themselves will reap the biggest benefit.

Higher Fare Authorized. — The Elmira Water, Light & Railroad Company, Elmira, N. Y., was authorized by the Public Service Commission to put into effect a 7-cent zone fare on May 10. Between zones the charge is 14 cents. The company has been charging a 6-cent rate. The company applied for the higher fare in order to increase certain men's wages.

"Walking Transfer" in Effect.—The St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., has put into effect a "walking transfer" system, permitting patrons of the Morganford bus line to transfer to the Southampton and Vandeventer car lines, although the buses do not intersect those lines. Inability to secure a permit to run the buses through Tower Grove Park resulted in the walking transfer plan. Under the new plan bus or street car patrons may transfer from either line to the other by walking through the park, a distance of about five blocks. The St. Louis Bus Company has also established a bus belt line in Northwest St. Louis by consolidating the Natural Bridge and West Florissant-Helen Avenue lines.

Fares Increased. — The New York Public Service Commission recently authorized the New York & Stamford Railway to put into effect a 7-cent fare on three days' notice. The fare in the first zone, the city of New Rochelle, will remain at 5 cents, but in the five other zones the fare will be increased from 6 cents to 7 cents. The company showed at the hearings that deficits have been sustained each year for several years, and declared that the increased fares were necessary to meet the paving requirements of the various communities. The road extends from New Rochelle through the villages of Larchmont, Mamaroneck, Rye and Port Chester to Stamford, Conn. The various municipalities have given their consent to the increase in rates, which are to remain in effect for one year.

Testimony Concluded. — The final argument before the arbitrators in the wage dispute affecting the employees of the United Electric Railways, Providence, R. I., has been heard. More than 4,000 sheets of testimony and nearly 200 exhibits were taken. Both parties to the controversy have agreed to accept and abide by the forthcoming decision until June, 1926. The present scale is 56, 59 and 61 cents an hour.

Trainmen's Recreational Buildings Started. — The Pittsburgh Railways, Pittsburgh, Pa., recently started construction of what is to be an enormous recreation center for trainmen and their families, and for special service to the public. Ten social service buildings are to be built, under the general welfare and recreational project recently launched by the company, at a cost of more than $500,000. The ground breaking took place recently in Ingram. In each building there will be established modern, well-equipped emergency hospital rooms.

Demands Referred to Trustees. — Wage demands of the trolleymen's union which have been filed with President J. K. Punderford of the Connecticut Company, New Haven, Conn., will be referred by him to the trustees. The present agreement will expire on June 1. The demand is a wage scale of 70 to 75 cents an hour for operators, whereas they have been getting 55 to 60 cents; 80 cents an hour for operators of one-man cars and 90 cents for bus operators. There is said to be a separate discussion pending over the employment of bus operators. It is understood that trolleymen are asserting that they should have first call on bus positions, but the company has been hiring outsiders.

Will Operate Buffet Cars.—It is reported that the Union Traction Company plans to operate buffet parlor cars between Indianapolis and Fort Wayne, by way of Muncie.

Higher Fare Avoided. — Through agreement with the St. Paul City Railway, St. Paul, Minn., the city has avoided segregation of the South St. Paul suburban car line and a larger fare rate between the cities. This rate is now 6 cents from any part of St. Paul to any other part of the city. The company may charge $20,000 a year to operating expense and lease the South St. Paul line. Otherwise the Railroad and Warehouse Commission would be required to fix a fair rate of fare based on the valuation of this property of the Minneapolis & St. Paul Suburban Railway. The St. Paul city attorney notes that on the basis of 75,000,000 fares, as in 1924, and a 7-cent rate of fare the St.Paul City Railway would net $1,300,000. This would be $100,000 more than a return of 7½ per cent on the valuation of the St. Paul lines, so the additional charge of $20,000 would have no particular effect.

Vote to Renew Contract.—Employees of the Rochester, Lockport & Buffalo Railroad, Rochester, N. Y., have voted to renew without any change in terms the present wage contract with the management.

New Coach Pamphlet Appears.—The city of Detroit, Department of Street Railways, started in May a pamphlet, called the *Coach Rider*, to acquaint the patrons of its coaches with the activities of the city of Detroit's coach division. The pamphlet will be issued twice a month. The first issue gave some conclusive figures on passenger coach service during the month of March and for the first 90 days of its existence, which ended March 31. A list of coach lines with routes and mileage and number of coaches in service was included.

Interurban Fares Advanced. — The State Corporation Commission of Virginia has granted the Virginia Railway & Power Company a general increase in fare over its Richmond-Petersburg interurban lines amounting to approximately 25 per cent. The commutation rate between Richmond and Petersburg for 50 trips, good for twelve months, was increased 16⅔ per cent. The increases went into effect on April 20. Between South Richmond and Petersburg the cash fare for adults, effective since Dec. 16, 1923, was 47 cents with a ticket rate of 42 cents.

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Financial and Corporate

Bad Year for Indiana Interurban

Deficit of $488,032 for 1924 Reported by Union Traction Company—Hurt by Auto Competition

The revenue of the Union Traction Company of Indiana, Anderson, Ind., from operation for 1924 was $3,339,187, compared with $3,890,689 for 1923, a decrease of $551,501, or 14.17 per cent. The operating expenses for 1924 were $2,656,065, compared with $2,647,123 for 1923, an increase of $8,942.36 or 0.34 per cent. The net income for 1924 is shown as a deficit of $419,632 compared with a surplus of $73,336 in 1923. Financial conditions compelled the passing of sinking fund payments during the year. Deduction of 1924 sinking fund charges, amounting to $68,400, would make the deficit for the year $488,032.

STATEMENT OF EARNINGS OF UNION TRACTION COMPANY OF INDIANA

	1924	1923
Revenue from transportation..	$3,196,640	$3,745,715
Revenue other than from transportation	142,547	144,974
Total operating revenue....	$3,339,187	$3,890,689
Total operating expenses...	2,656,065	2,647,123
Net operating revenue.....	$683,122	$1,243,566
Taxes.....	206,000	257,409
Net revenue less taxes.....	$477,122	$986,156
Other income.....	34,304	30,998
Gross income.....	$511,426	$1,017,155
Bond and other interest, etc...	931,059	943,819
Net income.....	*$419,632*	$73,336

Figures in *italics* denote deficit.

In the operating expenses for the year are included $588,132 for maintenance of way and structures and $349,686 for maintenance of car equipment, making the total for maintenance $937,819. The increase in operating expenses for the year is due to these increased expenditures for maintenance. Other operating expense accounts showed substantial savings.

In 1924, $247,691 was charged for additions and betterments to the company's property, and $37,371 was charged for extensions and betterments to the property of the Traction Light & Power Company. The 1923 figures for like purposes were $323,158 and $66,199.

Twenty-five new freight cars and six safety or "one-man" street cars were purchased during the year at a total cost of $112,112, included in "Additions and Betterments." This purchase was financed in part through the issue of $50,000 of 6 per cent car trust notes. Fifteen steel interurban passenger cars were contracted for, to be delivered in 1925, at a cost of more than $400,000.

Freight revenues for the last six months of 1924 showed an increase over the similar period in 1923 of $9,991, or 2.45 per cent, while the gross revenues from transportation as a whole, including freight, decreased $324,293. or 17.83 per cent. The total revenue derived from freight, milk and express traffic in 1924 was $811,270, or 24.30 per cent of the gross revenues from transportation as a whole. Like figures for 1923 were $832,553, or 21.4 per cent of gross revenues from transportation.

The Marion City Railway first mortgage 6 per cent bonds, amounting to $328,000, which matured May 1, 1924, were extended at the same rate to May 1, 1929.

Bonds Pledged to Secure Loans

In connection with financing to meet current requirements, an issue of $1,000,000 of general mortgage 6 per cent ten-year bonds dated June 1, 1924, was authorized by the directors and approved by the Public Service Commission of Indiana. Of these bonds, $700,000 were issued for use as collateral for loans and the remaining $300,000 are unissued.

President A. W. Brady says the great falling off in revenues for the year is attributable, in large part, to the increased use of automobiles in private and common carrier use.

Mr. Brady notes that the company is preparing to turn the bus to its own advantage. He says:

> Believing that there is a field for the operation of motor vehicles in co-ordination with the company's electric railway service, and in some instances in substitution therefor, a corporation has been formed under the name Traction Motor Transit Company, the shares of which will be owned by this company. The new corporation, to the end of 1924, had acquired only one bus, a Pierce-Arrow, now operated advantageously in co-ordination with interurban service at Fort Benjamin Harrison.

In referring to the receivership Mr. Brady says:

> The manifest inability of the company to meet its Jan. 1, 1925, interest and rental payments resulted in a suit by the Westinghouse Electric & Manufacturing Company in the Madison Circuit Court of the State of Indiana, wherein Arthur W. Brady was appointed receiver of the company on Dec. 31, 1924. The operations of the company's lines are now being conducted by the receiver.

2,253,847 Fewer Passengers

The report of this 449-mile road showed that only 14,405,496 passengers were carried on the interurban and city lines of the company in 1924, compared with 16,659,343 in 1923, a loss of 2,253,847. As has been indicated previously a slight improvement was reported in freight business. In 1924 the company handled 211,172 tons of freight, as compared with 183,485 tons in 1923.

TRAFFIC STATISTICS OF THE UNION TRACTION COMPANY OF INDIANA FOR YEAR ENDED DEC. 31, 1924

Passengers carried, interurban lines	5,622,318
Passengers carried, city lines	8,783,178
Total passengers carried	14,405,496
Freight handled	211,172 tons
Express handled	11,713 tons
Mileage of cars, interurban lines	6,431,107 miles
Mileage of cars, city lines	2,027,852 miles
Total mileage of cars	8,458,959 miles
Coal consumed at all plants	85,189 tons
Power generated (a.c) at all plants	43,497,064 kw.-hr.
Power generated (d.c.) at all plants	26,674,966 kw.-hr.

Twin City Wins Suit

Court Decides in Favor of Railway in Rate Suit—Hearings to Begin Soon —Case Reviewed

By a ruling of the State Supreme Court the Railroad and Warehouse Commission and the St. Paul City Railway win the first point in a legal battle which has delayed proceedings to determine an adequate rate of permanent fare to be based on the valuation of the company's property. These proceedings are at present before the commission.

The court rules there can be no appeal until the rate has been fixed. An appeal from the finding of value already made tentatively by the commission does not confer jurisdiction on the District Court. The commission made its valuation figures public on March 6. The city then obtained an order from the Ramsey District Court requiring the commission to file the valuation figures with the court. It was feared that should the Supreme Court decide for the city it would throw rate determination into the court.

Conference with City Arranged

Following the decision the commission notified the Twin City Rapid Transit Company, the holding company for both the Minneapolis Street Railway and the St. Paul City Railway, and the two city attorneys to arrange a conference, to be held within ten days, on the valuations and determination of rates of fare.

The City Attorney of St. Paul says he is satisfied with the court decision as it rules the city has lost no rights through failure to file appeal from any findings of the commission within 30 days.

It is found by the Supreme Court that:

> The order finding value is non-appealable, the District Court is without jurisdiction on the appeal and it should have been dismissed, and its order directing a return was without jurisdiction.

As to whether the order of the District Court directing the commission to make a return is appealable, the Supreme Court ruled:

> The city urges that the order from which the appeal is taken to this court is not appealable. The order puts the railroad to the burden of considering in the District Court the fair value of the railway property, though no rate has been established, and, though the court has not jurisdiction, it takes from the commission the authority vested in it by the statute to proceed to the fixing of a rate. The appellants challenge the jurisdiction of the court to proceed further, and they are met by an adverse ruling. It should have been in their favor.

Actual hearings before the commission in the rate determination began in October, 1923. The subject had been under discussion for several years prior to that time and continued to be an active issue at intervals until March, 1925.

The tentative valuations of the St. Paul and Minneapolis railway properties were handed down on March 6, 1925. The order by the lower court for the commission to file a valuation of the St. Paul company with the court was made on March 9. The Supreme Court decision was made March 15, 1925.

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New Holding Company After More Properties

The Electric Power & Light Corporation, New York, the holding company organized by the Electric Bond & Share Securities Corporation for utility properties in Utah, Idaho, Texas, Colorado, Wyoming, Oregon and Louisiana, has made an offer for control of the properties of the Southern Power & Light Company in Arkansas.

The Southern Power & Light Company controls the Mississippi Power & Light Company, the subsidiaries of which serve Jackson, Vicksburg, Delta, Columbus, Greenville and other points in Mississippi, and the Arkansas Light & Power Company of Pine Bluff.

Electric Bond & Share Company supervision already takes in certain Arkansas properties of the National Power & Light Company embraced in the Arkansas Central Power Company, which supplies electric power and light and railway service in Little Rock and North Little Rock. The consolidation of the properties of the Southern Power & Light with the Electric Power & Light Corporation, according to a letter of President H. C. Couch of the Southern Power & Light Company to stockholders, will place all of the latter's properties under the supervision of the Electric Bond & Share Company.

Holders of the cumulative participating preferred stock of Southern Power & Light will receive for each share one share of preferred stock without par value of the Electric Power & Light Corporation and one-half share of common stock, without par value, of Electric Power & Light. The cumulative participating preferred of Southern Power & Light has been selling in the market around $86 a share. The allotment certificates for preferred and common stock of Electric Power & Light were quoted respectively at $105 and $26 a share on May 16.

Baltimore Valuation Hearing Held Over

The hearing being held by the Maryland Public Service Commission to place a valuation on the property of the United Railways & Electric Company, Baltimore, was resumed on May 13 and after two days was held over. Most of the time during the two days was taken up by witnesses for the company called to put a reproduction cost on the property.

Charles A. Cummins, a witness for the United, testified that it would cost $5,993,501 to reproduce the company's buildings. The unit costs were challenged by Clarence W. Miles, people's counsel. A question from one of the members of the commission as to whether the company intended to make its park and resort property a part of its total capitalization brought a response from William H. Maltbie, counsel for the United, that this property would be included. He said that profits derived from the resorts were added to total traffic revenue. On the second day of the resumed hearing Adrian Hughes, Jr., superintendent of power of the United, testified as to the reproduction cost of power distribution and substation and power house equipment items. During the hearing Theodore A. Graser, engineer in charge of equipment, testified that it would cost $11,842,622 to reproduce the cars owned by the company, exclusive of electric equipment, and that the electrical equipment would cost $6,006,647.

Merger of Trenton-Philadelphia Lines Reported Under Way

Plans are said to be under way for a consolidation of three electric railways through which there would be a direct route from Bridge Street and Frankford Avenue, Philadelphia, to Trenton, N. J.

The three lines affected by the merger are the Pennsylvania & New Jersey Railway, operating from Trenton to Morrisville, Bucks County, a distance of 2 miles; the Trenton, Bristol & Philadelphia Street Railway, operating from Morrisville to Torresdale, a distance of 17 miles, and the Frankford, Tacony & Holmesburg line, operating from Torresdale to Bridge Street and Frankford Avenue, the terminus of the city-owned Frankford elevated line, 6 miles. This would give patrons from Trenton a direct line to the Elevated and into the business section of Philadelphia with only one transfer. Under the present arrangement three transfers must be made.

The tentative plan of consolidation calls for organization of a new company which would take over the three companies.

April Traffic Falls Off in Toledo

Although operations of the Community Traction Company, Toledo, Ohio, showed a further slump in riding in April a slight amount was added to the stabilizing fund. An operating deficit of $58 after all charges was changed to a net surplus of $26 through interest earned on the cash balance in the stabilizing fund. There is a deficit of $130,498 in that fund in addition to the original $400,000 which has been exhausted.

Gross revenue for April was $311,473, as compared with $347,099 last year on the lower fare basis. Operating expenses were pruned down by more than $43,000, due largely to cheaper power, cut in car mileage operated and use of one-man cars. Bus operations on feeder lines showed a loss of 3.83 cents a passenger, or a gross loss of $1,439.

In April 4,150,436 revenue passengers were carried, compared with 4,984,013 in a similar month last year and 5,370,837 in April, 1923. Commissioner E. L. Graumlich and the board members attribute the falling off in riding largely to the increase in the use of the private automobile.

Mr. Henderson Comments on Progress in Seattle

"Seattle's street railway system has met all its financial obligations promptly during six years of municipal ownership and operation." D. W. Henderson, superintendent of the system, made this statement is a recent address. He said:

> We are operating under an 8½-cent fare and will continue to do so, provided we are careful and don't attempt to make capital investments out of the earnings of the property.

Mr. Henderson also stated that out of its earnings the system has paid $4,921,400 on the principal and $3,382,000 on the interest of the $15,000,000 utility bonds issued for the traction properties. In addition, $2,420,708 has been spent on way and structures and $3,067,863 on equipment.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares*† 1913 = 4.84	May 1925 **7.27**	Apr. 1925 **7.26**	May 1924 **6.95**	May 1925 **7.27**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	May 1925 **153.9**	Apr. 1925 **157.3**	May 1924 **160.8**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	May 1925 **222.2**	Apr. 1925 **221.6**	May 1924 **217.8**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5 91	Apr. 30 1925 **4.45**	Mar. 31 1925 **4.86**	Apr. 30 1924 **3.33**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	Apr. 1925 **17.72**	Mar. 1925 **17.76**	Apr. 1924 **16.05**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number	Apr. 1925 **1658**	Mar. 1925 **1631**	Apr. 1924 **1726**	Jan. 1924 **2231**	Sept. 1924 **1277**
Liabilities (Millions)	**50.92**	**35.14**	**73.26**	**122.95**	**27.71**

Conspectus of Indexes for May 1925

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer

Worcester, Mass.

	Latest	Month Ag	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	May 1925 **207.2**	Apr. 1925 **209.6**	May 1924 **222 3**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	Apr. 1925 **156.2**	Mar. 1925 **161.0**	Apr. 1924 **148 4**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	May 1 1925 **13.32**	Apr. 1 1925 **13.69**	May 1 1924 **12.56**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	May 1 1925 **193.3**	Apr. 1 1925 **194.5**	May 1 1924 **84 7**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	Apr. 1925 **150.8**	Mar. 1925 **151.1**	Apr. 1924 **141**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	Apr. 1925 **164.8**	Mar. 1925 **165.3**	Apr. 1924 **161.8**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

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Stone & Webster Get Virginia Property

Rumors long in circulation regarding an impending sale of a controlling interest in the Virginia Railway & Power Company, Richmond, Va., have been set at rest. On May 21 it was definitely announced that Frank J. Gould, owner of the controlling interest in the company, had sold his holdings to Stone & Webster.

According to information in New York, the negotiations have been between C. A. Stone of Stone & Webster, Inc., and Mr. Gould at Paris, where the latter has resided for several years. Mr. Stone is expected back in two or three weeks. The announcement of the closing of the deal came from Richmond.

The preferred stock, of which there is $8,987,090 outstanding, pays dividends of 6 per cent per annum. The common, of which there is $11,950,500 outstanding, has paid no dividends since 1918, when a dividend of 3 per cent was made payable in stock of the Old Dominion Iron & Steel Corporation. The balance available for common dividends in 1924 was $1,681,288, compared with $806,062 in 1923 and $642,767 in 1922. In 1921 the balance for the common stock was $1,783,437.

It is believed that Stone & Webster have in mind segregating the railway from the power properties, retaining the railways and disposing of the power properties eventually to other interests.

The company owns or controls through lease practically the entire street railway, electric light and power business in Richmond, Petersburg, Norfolk (all except the line to Virginia Beach), Portsmouth and Berkeley; an interurban railway connecting Richmond and Petersburg; a line from Norfolk to Sewell's Point, where connection is made by ferry to Newport News and Old Point Comfort; electric light business of Suffolk, Va., and the City Gas Company with unlimited franchises.

Surplus Improves on San Francisco-Sacramento Line

The operating revenue of the San Francisco-Sacramento Railroad, San Francisco, Cal., for the year ended Dec. 31, 1924, showed a decrease of $42,403 over the preceding year. The operating expenses were $843,652, a decrease of $48,255 over the previous year. The surplus for the year was $42.758, as shown in the accompanying table. It represented an increase of $6,543 over 1923.

EARNINGS AND EXPENSES OF SAN FRANCISCO-SACRAMENTO NORTHERN R.R. FOR YEAR ENDED DEC. 31, 1924

Total revenue from transportation	$974,441
Total revenue from other railway operations	16,108
Total railway operating revenue	$990,549
Total railway operating expenses	843,652
Net operating revenue	$146,897
Taxes assigned to railway operation	53,780
Operating income	$93,118
Non-operating income	5,627
Gross income	$98,745
Totel deductions from gross income	55,987
Surplus	$42,758

The operations of the road for 1924 show a decrease in passenger and an increase in freight revenue, with a gain in the net over the preceding year. It has been the effort of the company by increased facilities, of which the new Union Station in Sacramento is most important, to offset the inroads made by the privately owned automobiles.

Since the organization of the San Francisco-Sacramento Railroad, in 1920, $903,157 has been expended for betterments and improvements; $168,000 in bonds have been retired to Dec. 31, 1924, and $42,000 additional bonds were retired Jan. 2, 1925. To reimburse the treasury for these capital expenditures only $200,000 in bonds has been issued to date. According to Walter Arnstein, president, it will be necessary to arrange for further financing to cover these expenditures and additional charges for capital expenditures, which are essential to develop the property successfully. The number of passengers carried in 1924 was 823,517 and the total car mileage was 2,157,329.

Michigan Interurban Sold

The United Light & Power Company, Grand Rapids, Mich., has sold all its holdings in the Grand Rapids, Grand Haven & Muskegon Railway, a high-speed interurban railroad, connecting Grand Rapids, Muskegon and Grand Haven, Mich., to Sydney L. Vaughan, vice-president and general manager of the road, and other Grand Rapids men.

City Valuation of Seattle & Rainier Line Raised

The city of Seattle's appraisal of the Seattle & Rainier Valley Railway, with a view to purchase, was raised recently from the original figure of $1,045,547 to $1,100,000. This figure, however, is below the value set by Walter M. Brown, general manager of the company. It is said the city will stand pat on the new amount. In naming the new price, Clark R. Jackson, superintendent of public utilities, explained that several items of equipment have now been taken into consideration that were omitted when the city's experts went over the properties the first time. Mr. Brown, in naming a purchase price of $1,500,000, claims a valuation $400,000 greater than the revised appraisal, including allowances for interest on construction and on bonds which members of the City Council refuse to recognize. Final purchase negotiations will be entered into when City Comptroller Harry W. Carroll audits the company's books.

Traffic Declines.—During the month of April the Cincinnati Traction Company, Cincinnati, Ohio, transported 626,910 fewer passengers than in the similar month of last year. The figures were: April. 1925, 8,079,660; April, 1924, 8,706,570. The report to Street Railway Director Kuertz shows, however, that the traction company earned sufficient revenue to meet all its obligations, including the city tax, and that no increase of fare will be necessary.

Capital Stock to Be Reduced.—A certificate has been filed in the office of the Secretary of State reducing the capital stock of the Sixth Avenue Railroad, New York, N. Y., from $2,000,000 to $1,700,000.

Seeks to Discontinue.—The Pacific Electric Railway, has applied to the California Railroad Commission for permission to discontinue through passenger service between Long Beach and Huntington Beach. The company stated as its reason the fact that the expense of operation was greatly in excess of the revenue derived.

Land Sold.—Sale of two parcels of land at Paterson, N. J., by the Public Service Railway, Newark, N. J., for $77,796 has been approved by the New Jersey Board of Public Utility Commissioners.

Stock Change Approved.—The stockholders of the Federal Light & Traction Company, New York, N. Y., have authorized the cancellation of the company's unissued 8 per cent preferred stock and the issuance of 385,625 shares of common stock of $15 par in exchange for the 77,125 shares of no par value common now outstanding. This is at the rate of five new shares for one of the old issue. The total authorization of common stock is 1,000,000 shares. The company will hereafter have only one class of preferred stock of no par value entitled to dividends of $6 a year.

Net Income Higher.—For the ten-month period ended April 30, 1925, the total operating revenue of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., was $35,775,680, against $32,904,417 for a similar period in 1924. The expenses increased from $21,947,237 to $23,494,442 for the ten-month period ended April 30 of the present year. After the consideration of income deductions the net income was $4,119,290, against $3,018,962 for the ten-month period ended April 30, 1924.

Chicago Interests Get Interurban.—The Illinois Power & Light Corporation expected to acquire the Galesburg & Western Interurban, now known as the Rock Island Southern Railway, on May 18 at the tax delinquency sale to use the right-of-way for construction of transmission lines between Monmouth, Ill., and the Knox County line. The company is reported to have given assurance that it would bid $7,000 on the line, on which taxes to the amount of $9,184 are due, but totaling $26,580 with various penalties. In addition the corporation is reported to have paid the Walsh interests, holders of the property, $1,000 a mile for the line, the deal having been approved by the Commerce Commission recently.

Earnings Off in St. Louis—The United Railways, St. Louis, Mo., exclusive of the Missouri Electric Railway, for the first three months of 1925 reports: Gross revenue, $4,694,174; operating expenses, $3,306,591; depreciation, $375,000; taxes, $437,913; income from operation, $574,669; non-operating income, $64,627; gross income, 639,296; interest and miscellaneus charages, $723,909; deficit, $84,612. Compared with the similar period in 1924 gross operating revenues decreased $372,356. In 1924, for the first quarter, there was a surplus of $123,990.

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Personal Items

Messrs. Clifford and Bradley Advanced

George H. Clifford, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., winner of the Coffin medal last year, has been appointed Southwestern district manager over all Stone & Webster properties in Texas, Louisiana and New Mexico.

Luke C. Bradley, former district manager for Stone & Webster in the Southwest, has been promoted to division manager in charge of the Southeastern and Southwestern districts with headquarters in Boston.

Mr. Clifford has had charge of the Northern Texas property since 1910. From 1901 to 1910 he progressed through the positions of bookkeeper, assistant treasurer and general superintendent. He is a native of Tarrant County, Texas, and attended Weatherford College, Weatherford, Tex.

W. E. Wood President Southwestern Association

W. E. Wood, manager Houston Electric Company, Houston, Tex., has been elected president of the Southwestern Public Service Association. In putting an electric railway man at the head of their organization the executives of the Southwest have recognized the able and valuable service performed by Mr. Wood during the past year as chairman of the railway section. This work culminated during the recent Houston convention in a railway program characterized by many high grade papers and by frank and spirited discussion of numerous phases of the electric railway business and operation.

Under Mr. Wood's leadership, the relationship between the railway and the community in Houston have reached a stage of frank understanding. He has been a consistent advocate of unified transportation service for a given territory and has successfully brought the public to see the advantages of a co-ordinated bus and rail service to replace the former city-wide jitneys which flourished for a considerable period. In the use of buses, Mr. Wood is a believer in co-ordination of transportation management as well as service, to the end that bus and car are handled alike by the existing departmental forces of the railway.

Mr. Wood is a native of South Carolina. He was graduated as an electrical engineer from Georgia Institute of Technology and has been continuously identified with the electric railway industry since then. During that entire time he has been associated with the Stone & Webster interests in various capacities on properties under their management.

He joined the forces of Stone & Webster as an apprentice in Boston and was assigned to the statistical department. He was next sent to the Jacksonville Traction Company, where he rose from a motorman to the position of superintendent of transportation. In 1916 Mr. Wood went to Houston as superintendent of transportation and the following year was transferred to the El Paso Electric Railway, as superintendent of the railway department. In 1918 he was made manager of the Galveston Electric Company, where he remained for two years before returning to Houston as manager of the Houston Electric Company.

W. E. Wood

Carroll L. Proctor New Head of Toledo Edison Company

Carroll L. Proctor has assumed his new duties as vice-president and general manager of the Toledo Edison Company, Toledo, Ohio, succeeding B. C. Adams, who was transferred to Kansas City, to have charge of gas properties in several Southwestern states.

His first job was with the General Electric Company, at Schenectady, N. Y., at a salary of $8 a week in the testing department. Later he was made general superintendent of the Athens Railway & Electric Company, Athens, Ga., and when Henry L. Doherty & Company took over its operation in 1912 he remained with the company in the same capacity. He has been with the Doherty organization ever since. After seven years at Athens he went to Joplin, Mo., as sales manager of the Empire District Electric Company, where he remained for three years before being promoted to vice-president of the Danbury Gas & Electric Company, Danbury, Conn. From that post he was transferred back to Joplin to become vice-president and general manager of the Empire District Electric Company. He succeeded Mr. Adams there.

C. L. Proctor

Mr. Proctor was very popular with townspeople and associates at Joplin and was tendered a testimonial dinner upon his departure. The Joplin *News-Herald*, in a two-column editorial in a parting word to Mr. Proctor, says:

> Of the new type of executive, quiet, soft-spoken, tranquil, Proctor never finds it necessary to foam at the mouth and lash himself into hysterical excitement. But he is none the less efficient. Under his management the fortunes of the district's Doherty concerns have advanced signally. At the same time he has retained the friendly good will of the public—something that can only eventuate when management is based on the fine principle of real public service.

Mr. Proctor is 45 years old. He was born in Charlotte County, Virginia. After attending country schools he matriculated at Virginia Polytechnic Institute and later was graduated from that school.

Mr. Proctor is the first head of the Toledo Edison Company to be entirely independent of official duties with the Community Traction Company, which under the new arrangement will be under the direct management of J. Frank Johnson, as vice-president and general manager. Frank R. Coates, who is at the New York headquarters of Henry L. Doherty & Company, is president of the Toledo Edison Company.

Harold Evans was appointed a member of the Pennsylvania Public Service Commission on April 28 by Governor Pinchot.

Obituary

Dr. Daniel F. Hardenman, Sr., for 26 years physician for the Arkansas Central Power Company, Little Rock, Ark., died recently in Little Rock.

Charles E. Fritts died recently in Lincoln, Neb. For 22 years he was chief electrical engineer of the Kansas City Railways, but resigned that position in 1918 to enter the employ of the United Power & Light Corporation at Abilene, Kan. He retired in July, 1924.

Charles A. Russell, a member of the Massachusetts Public Service Commission from 1915 to 1920, died suddenly on May 13 on board the steamship *Boston*, while en route from New York to Boston. Mr. Russell practiced law for many years at Gloucester, Mass., where he made his home. He was born at Lynn, Mass., in 1855 and was educated at Colby College and Boston University.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Westinghouse Had Good Year

With the exception of the fiscal year ended March 31, 1919, the Westinghouse Electric & Manufacturing Company reported for the fiscal year ended March 31, 1925, the largest gross business in its history. Sales billed aggregated $157,880,292, comparing with $154,413,000 for the previous year. Except for the year ended March 31, 1919, when sales billed were $160,379,943, those of 1923-24 also were a record for the company.

Cost of sales was $144,242,065, leaving a net manufacturing profit of $13,638,227, which compares with $17,406,638 for 1923-24, when cost of sales was $137,006,280. Other income was $4,203,179, and the gross income from all sources $17,841,406. After deducting interest charges, etc., of $2,517,042, the net income available for dividends and other purposes was $15,324,364, against $16,125,303. Dividends paid on the preferred and common stock were $9,468,221, and the amount added to surplus was $5,612,606, comparing with a surplus of $8,971,647 for the previous year.

After preferred dividends of $319,896 the net income was equivalent to $6.55 a share on the $114,504,450 of $50 par value shares of common outstanding at the end of the corporate year. For the preceding year the earnings per share were $7.61 on the $103,731,450 of $50 par value common outstanding as of March 31, 1924.

The decrease in the total value of all orders booked was 5 per cent, compared with the previous year. The value of unfilled orders on March 31 was $55,271,908 against $63,738,700 at the close of the previous fiscal year.

In his report to the stockholders Gen. Guy E. Tripp, chairman of the board, says that in pursuance of a plan of decentralization by departments with the ultimate view of retaining at East Pittsburgh mainly the manufacture of heavy electrical machinery, certain lines of products had been transferred to works at Sharon, Pa., South Philadelphia and other places.

Attention is directed in the report to the several activities of the company in the interest of the social and financial welfare of its employees, "which," according to General Tripp, "the directors believe to be in accordance with an enlightened industrial policy."

Bus Manufacturer Reviews Year's Operations

According to President W. C. White of the White company the demand continues good for buses from street railway and steam railroad organizations. As Mr. White sees it, year by year the economies of the motor truck and the motor bus are contributing their share toward economy in production. More than ever, however, does he regard it as necessary for the producer and operator to realize the fullest benefits from the installation of efficient truck and bus units.

The annual rollcall of White fleets shows that 835 of the country's foremost truck owners are operating 31,025 White trucks in fleets of ten or more, an increase of 73 owners and 2,839 trucks over the record of the previous year.

In his report on the operations of the White Motor Company for the year the president calls particular attention to the organization last November of the White Motor Securities Corporation to facilitate the financing of sales of trucks and buses. The point is stressed that the White company has a total of 54 direct factory branches and service stations, which, together with hundreds of dealers' stations provide exceptional facilities to the many thousand of White bus owners. Gross sales of the White company for 1924 were $46,574,737, compared with sales of $48,876,606, in 1923.

Brooklyn Company to Spend $2,000,000 in 1925

Practically $1,000,000 will be spent this year on track reconstruction and street repaving by the surface companies in the Brooklyn-Manhattan Transit System. This does not include expenditures to be made by the Brooklyn City Railroad, which is not a part of the B.-M.T. System. The work already done this year and to be done by the B.-M.T. is being carried out so as to co-ordinate with street work that the public authorities propose to do during this year. This program has been under consideration for some time and has been substantially enlarged over that considered by the board at a previous meeting.

Nearly $100,000 has already been spent in reconstructing the surface tracks on the Brooklyn Bridge, in cooperation with the Department of Plant and Structures. In addition to this, $840,000 is to be spent on reconstruction of surface tracks and repaving incidental thereto in Brooklyn and Queens, though most of the work will be done in Brooklyn. Under this year's program, involving approximately $1,000,000, nearly 20 miles of tracks will be reconstructed. This is about 16 per cent of the total mileage of surface tracks in paved streets belonging to the B.-M.T. System. It compares with $540,000 spent during 1924 on approximately 12 miles of surface track and with $320,000 spent in 1923 on about 7 miles of surface track.

As to rapid transit lines, it was stated on May 18 that the work of lengthening the station platforms on the Fulton Street elevated line is already under way. This will allow the operation of seven-car trains to meet the increased traffic conditions on that line. The board of directors authorized an appropriation of $125,000 for this work a month ago.

In addition to these expenditures $500,000 will be spent on the Williamsburg Bridge and in the Centre Street loop. These contracts have been let. This expenditure will provide for the installation of track and line equipment of the same standard installed on other portions of the subway system.

The directors on May 18 also authorized an expenditure of $300,000 on plans submitted to it for installation of block signals and interlocking on the center tracks on the Fulton Street and West End elevated lines, together with miscellaneous additional signaling on the elevated system.

Government to Keep Hands Off Business

So far as business is concerned the developments at Washington of greatest interest recently are the remarks of the President about the hands-off policy of the administration and the Department of Commerce pronunciamento about the meaning of this country's investments abroad. The President intimated that business can go ahead with little fear of officious interference from Washington. It is urged that his statement is justified for the following reasons:

(a) The Tariff Commission, now that Mr. Culbertson is out, can operate with a clear majority that thinks eye-to-eye with the President.

(b) The Federal Trade Commission has been brought into harmony with the administration. Its new majority is not only abolishing those practices which seemed unnecessarily disturbing, but is devoting itself additionally to "constructive policies."

(c) The Shipping Board holds office "during good behavior" only and must act in a seemly manner or suffer change of personnel.

(d) The Department of Justice (opposition elements maintain) will confine itself largely to routine matters, and is not likely seriously to encourage spectacular doings.

Rarely has an administration had the subsidiary agencies of government so well under control. It has taken time to accomplish this, and it has been done without glamor. Business, therefore, has nothing to fear from administration activity. It need concern itself only, just now, with the making of major legislative policies.

Metal, Coal and Material Prices

Metals—New York	May 19, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	7.05
Zinc, cents per lb	7.28
Tin, Straits, cents per lb	55.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.75
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.07
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.03

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As for the Department of Commerce comment, that bureau of the government states that our investments abroad "mean an increasing volume of imports, not necessarily from the countries in which the investments are made, but from the whole world." Debts to South America can be paid with European credits.

Rolling Stock

United Railways & Electric Company, Baltimore, Md., has just purchased three de luxe buses, which will be delivered the end of this month, and six additional double-deckers with all weather tops.

United Traction Company, Albany, N. Y., through its bus-operating subsidiary, the Capitol District Transportation Company, has ordered nineteen six-cylinder gasoline-electric buses from the Fageol company.

City of Detroit, Department of Street Railways, has been authorized by the Council to enter into a contract through the Detroit Street Railway Commission for 25 more buses, which, when put in operation, will bring the city's total number of buses to 90. The new bus order is split, fifteen being bought from Dodge Brothers and ten from the Reo Motor Car Company.

Track and Line

Seattle, Wash. — The utilities committee of the City Council has voted $52,550 from the city railway's depreciation reserve fund to construct a double track and pave on Twenty-fourth Avenue north between East Lynn and Hamlin Streets. This improvement will further augment the service over the Montlake line to the University of Washington campus and the University stadium.

Reading Transit Company, Reading, Pa., has started construction of a double-track line on Lancaster Avenue, from the Bingaman Street Bridge to the city line. In connection with this improvement tracks have already been laid across the new Bingaman Street Bridge. This part of the work will be finished by June 1. Approximately $275,000 will be spent on the improvements in the Eighteenth Ward and the laying of tracks across the bridge on Fourth Street from Bingaman to Chestnut and on Bingaman from Fourth to Fifth. This improvement will provide improved facilities for residents of the Eighteenth Ward and places outside of the city served by the cars on the Mohnton-Adamstown division.

San Francisco, Napa & Calistoga Railway, Napa, Cal., announced that work on the waterfront railroad line would commence on May 15. T. F. McGill has the excavating contract. The cost of the 1-mile spur will be $50,000.

St. Joseph, Mo.—Contracts have been awarded for the construction of the Sixth Street viaduct in St. Joseph, Mo., over the tracks of the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fé. The general work on the superstructure was let through the Chicago, Burlington & Quincy engineering department to the Kelly-Atkinson Construction Company of Chicago for a lump sum of $63,000. The structural and reinforcing steel will be purchased from the St. Joseph Structural Steel Company, while the construction of the approach was given to the Land Construction Company, Ballinger Building, St. Joseph. The bridge is of reinforced concrete construction, the principal items being 1,382 cu.yd. concrete, 280 tons structural steel, 75 tons old structural steel remodeled and reerected, 1,566 sq.yd. wood block paving and 90,000 ft. sub-planking. The structure will cost approximately $131,000. The Missouri Public Service Commission some time ago allotted the construction costs as follows: Chicago, Burlington & Quincy, $46,071; Chicago, Rock Island & Pacific, $34,340; Atchison, Topeka & Santa Fé, $12,019; St. Joseph Railway, Light, Heat & Power Company, $15,583, and city of St. Joseph, $22,678.

Trade Notes

Austin Company, Cleveland, Ohio, announces the removal of its New York office to the Equitable Building, 120 Broadway. The New York staff has been increased. The Austin Company, engineers and builders, reports an increasing volume of industrial construction on the Atlantic Seaboard during the past few months. J. K. Gannett is the district manager of the New York office. A. D. Engle and D. C. Raymond are his assistants.

Smith-Springfield Body Corporation and the **Springfield Body Corporation, West Springfield, Mass.,** have been reorganized. James N. Swift has been elected president of the Smith-Springfield Body Corporation, the new company, to succeed C. S. Dame; Ralph M. Sparks, vice-president, in charge of sales, to succeed A. H. Wolfe, and Hinsdale Smith, vice-president in charge of engineering, a new office. Frank M. Livingstone, former secretary of the corporation, was named treasurer, succeeding C. S. Dame, who formerly was vice-president and treasurer. L. L. Homer was elected secretary. The plant at West Springfield, Mass., will resume the manufacture of bus bodies.

Taylor-Wharton Iron & Steel Company, High Bridge, N. J., announced that G. R. Lyman, general sales manager, resigned, effective May 1. G. R. Hanks, formerly superintendent of the company's High Bridge plant, has been appointed assistant to the president, with full charge of all sales. Stanley Apgar has been appointed plant superintendent.

L. B. Foster Company, Pittsburgh, Pa., dealer in rails, has announced that it has moved its general offices to its warehouse yards at Carnegie. The company says it will still maintain a mailing office at its home headquarters in the Park Building, Pittsburgh, where the president, L. B. Foster, will be located. All other offices have been moved to Carnegie.

Forged Steel Wheel Company, Pittsburgh, Pa., announces the removal of its New York offices to 120 Broadway.

Timken Roller Bearing Company, Canton, Ohio, announces that it has purchased the physical assets of the Gilliam Manufacturing Company. The Timken company considered that this co-ordination of manufacturing capacity, processes and patents would better serve its customers. The production of both Timken bearings and Gilliam bearings will be continued in their respective plants.

Conveyors Corporation of America, Chicago, Ill., says that its American monorail cable conveyor will be handled in Ohio by H. P. Rodgers, Leader Building, Cleveland. Mr. Rodgers will have associated with him in the sale of this equipment Eugene Smith, formerly with the Galion Iron Works. E. A. Grimmer has joined the sales organization of the Lathrop-Trotter Company, Cincinnati, which is district representative of the Conveyors Corporation of America. Mr. Grimmer is a mechanical engineer. He was recently with the sales force of the Ellicott Company of Cincinnati.

H. D. Church, formerly chief engineer of the truck department of the Packard Motor Car Company and for the last eighteen months assistant chief engineer of the Chevrolet Motor Company, became identified with the White Motor Company on May 15 as director of Engineering. George W. Smith, formerly in charge of the experimental and research departments of the White Motor Company, has returned to the company as technical assistant to Thomas H. White, vice-president and general manager, and will have charge of the technical division of the staff.

Johnson Fare Box Company, Chicago, Ill., has removed its New York office from 366 Madison Avenue to 908 Eighth Avenue.

New Advertising Literature

Nichols-Lintern Company, Cleveland, Ohio, has issued a new pamphlet on "Two safety ideas for your cranes." It describes a signal light to prevent "bumping" and sand crane runways from the cab.

Irving Iron Works Company, Long Island City, New York, has issued catalog 4 A 172, on the Irving fireproof open steel flooring.

Pittsburgh Testing Laboratory, Pittsburgh, Pa., has issued Bulletin 36, entitled "Practical Motor Bus Inspection." The pamphlet describes in detail just what practical inspection of the materials and workmanship of a bus means and outlines the work of its highly specialized inspection engineers and chemists.

Alexander Milburn Company, Baltimore, Md., has issued a 24-page pamphlet, called "the Milburn Light," for contractors, railways, mines, quarries; also a 24-page booklet entitled "Milburn Welding and Cutting Apparatus." These booklets may be obtained upon request to the office at 1416-1428 W. Baltimore Street, Baltimore.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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This Year's Exhibits Should Be of High Quality

ONLY 90,000 sq.ft. of space is available on Young's Million Dollar Pier at Atlantic City for exhibit purposes. This will all be available for the October convention of the American Electric Railway Association. If the space assignment of last year is any criterion to go by, the whole 90,000 sq.ft. will be sold out on the initial allotment. The space rate will be 65 cents per square foot, the same as for the last two conventions. Moreover, there will be no exhibits this year by either the Master Car Builders or the National Electric Light Association. Undoubtedly the committee in charge will be hard pressed to find sufficient space to accommodate all those who wish to show goods.

With this prospect of space limitation in mind, each exhibitor should use care in selecting for display the things which will be of greatest value. In the past much attention has been given to samples, beautifully finished, but not having in any respect the same appearance as the actual parts as used. Most interest frequently has been given to old and worn specimens, particularly those which have been tested to failure. A complete life history attached gives the delegate a lesson in good and bad practices that few demonstrators could teach.

While this suggestion is not applicable to all types of equipment, it should be worthy of study by the exhibitor. Every exhibit of this sort that can tell its story should be well worth while.

Centralized Transit Control Is Highly Essential

URBAN transit must be centralized under one control. This is the conclusion reached by Ross Schram, general manager at Detroit, and laid down by him as a policy to be adopted by the city if fares on the railway are to be kept down and a high riding habit maintained. It is all so self-evident that there would seem to be little need for pointing out the economic fallacies of any other scheme.

Still the process of permitting competitive traffic goes on apace, not only at Detroit, but in many other cities. Not always is it possible accurately to gage the extent of the effect of this duplication of effort. Even in Detroit Mr. Schram has been able only to arrive at a good approximation. In short, between 35,000,000 and 40,000,000 passengers a year are being handled at Detroit at a fare of 10 cents or better on buses of one kind or another. This is a menace to the Detroit Municipal Railway—not a grave menace, perhaps, but a big handicap. Mr. Schram is seeking to convince the Council of the folly of permitting this condition to continue. His summary proves the great transportation waste that is taking place under the present competitive system in Detroit. It would seem that a city operating its own system would be first to discover this. Still it has been necessary for Mr. Schram to reiterate that in fixing future policy the rate of fare should be the starting and the finishing point. Centralized and responsible transportation is the need everywhere. There is no other way in which fares can be kept down. His statement to his own Council contains an eloquent plea applicable to private companies in other cities similarly situated with respect to competition.

Some Worth-While Things the Railway Industry Overlooks

HOW often have we said of this or that man: "What great things he could achieve if he made full use of his powers; but the trouble is that he is content merely to exist or get by."

What applies to men may apply to groups of men or to industries as well. A case in point is afforded by contrasting the efforts of motor bus and of electric car operators to secure traffic. The motor bus is inferior in many respects to the electric car, but its operators are vigorous and have the ambition to please. The electric car has inherently finer qualities and opportunities, but these are less frequently developed to maximum efficiency and attractiveness.

Let us begin with propulsion, for example. A motor bus is propelled by intermittent explosions whose force is transmitted through an elaborate train of gears. Knowing this, the motor bus builders and operators keep ever on the watch for ways to smooth out these explosions by the multiplication of cylinders and by making improvements in noise-reducing schemes. A trolley car is propelled by a continuous stream of power that can be shaded to the finest degree and its gearing can readily be kept noiseless. Yet are all electric railways as keen as they might be on the subjects of resistor steps and gear teeth and lubrication?

Next consider heating and ventilation. The motor bus operator figures all the possible ways of distributing the heat from the exhaust to secure some uniformity of warmth, but how could he compete in that respect with electric heating through numerous small-capacity units with thermostatic control if the electric operator chose to give up the coal stove or the old-fashioned large-capacity electric heaters? As for ventilation—the best buses are not free from some reminder of gasoline or oil, but how many electric cars are fitted with the best available devices in ventilation —not to mention blowers or fans?

In the motor bus, entrance and exit facilities are far inferior to those of the trolley car, one reason being the greater difficulty of using power-operated doors and steps. Yet there are left plenty of trolleys which leave to the brawn of the car operator something that could be better done with the unlimited power supply in the trolley wire.

Almost everywhere, the electric car is free from the wheel housings and the over-all width restrictions that shackle the bus, but this does not mean that electric car

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operators invariably plan aisle and seat widths that make for comfort. The fault with many cars is that too many seats are crowded into a given area, so that ample knee room or easy seating for a pair of riders on one cross-seat is not provided. A bus man may be compelled to cause discomfort with wheel housings, but is any electric railway forced to place sand boxes, door engines or other things in places where they will annoy the patron?

But perhaps of all failures to exploit electric railway advantages, seat design is the worst. The operator of a bus knows that his vehicle would be far from enjoyable if he did not cushion the vehicle on air tires and the passenger on soft upholstery. The operators of many electric cars running on a bumpless private railway seem to think that a slat or shaped wooden seat is good enough, overlooking the fact that the soft upholstery that makes the bouncing bus endurable is the very thing that would make the smoother-running trolley truly enjoyable.

A Constructive Force in American Business

DEDICATION of the new home of the Chamber of Commerce of the United States, which was done with fitting ceremony, was one of the impressive features at the annual meeting of the chamber held last week in Washington. This organization now has attained the goal announced at its formation thirteen years ago. That was to create an organization which would crystallize the thinking of American business men so that, always keeping in mind the public interest, it would present the views of business to the public at large, to officials of the government and to legislative bodies.

This work has been done so well that the chamber has received the commendation of each President of the United States since its formation, as well as that of Cabinet officers and leading members of both houses of Congress. That the people's interest has always been the guiding policy of the chamber was the opinion quite fittingly expressed by Chief Justice Taft at the dedication. It was during his administration as President and with his approval and urging that the chamber was established. Taken together, said the Chief Justice, its members have no selfish or other aim, narrow or contracted, that blinds them to the general good. They are not men of one idea. As much as any one set of men, they have the spirit of good will to all elements of our society.

The value of the chamber should not be overlooked by those in the transportation business, particularly electric railway men. That its department of transportation and communication is concerned with problems that are of vital interest to the industry was evidenced by the meeting of that group. High among the officers of the chamber are men prominent in the electric railway and utility fields.

It behooves those who have the best interests of the country and of their communities at heart to see to it that the thinking of the chamber is conducted along sane and constructive lines. With this done, its influence in molding public opinion, both nationally and locally, cannot fail to be of great help in preventing wild and impractical ideas from dominating the various governing bodies. On the other hand, the chamber can be of immense value to electric railway executives in bringing before them the combined sentiment of the thinking men in the nation. It can show them trends of thought and action. Correct interpretation of this can be made to yield great dividends in preventing costly errors of judgment on the part of the executives. The value of this is so great that it cannot be overlooked without serious loss.

Prospects at Denver Appear Good

JUST four years and a half ago the Denver Tramway was placed in the hands of Ernest Stenger as receiver. A plan of reorganization has been agreed upon and the receivership is about to be terminated. Not all the phases of the effort made to restore this system to its proper place can be covered in comment, but certain matters are of both practical and academic interest. The court's valuation of $23,514,769 for the lines within the city is less than the amount sought by the company, but it is greatly in excess of the bonds that will be outstanding after the new plan has been put into effect.

Underlying bonds to the amount of $4,635,000 will remain undisturbed in the reorganization. There has been no default on them. Funded debt will, however, be reduced from $17,421,700 to $11,078,350, with an adjustment of $3,953,337 arrears of interest, a total reduction of $10,296,687. Holders of bonds other than those undisturbed will receive one-half in new bonds and one-half in preferred stock, with preferred stock for all of the unpaid bond interest. The amount of the preferred stock will be $10,318,145. This preferred stock will be cumulative only to the extent of 5 per cent at all times, and the remaining 2 per cent is to be cumulative only when earned in any year but not paid. There will be 61,250 shares of no par common.

Annual charges will be reduced from $953,015 to $580,849 and annual sinking fund charges from $332,911 to $114,433. Of the bonds undisturbed 50 per cent mature in 1927, but a new mortagage will provide the means with which to pay or refund these issues. Cash in the hands of the receivers and payments required by stockholders will leave the company a balance of about $750,000 after payment of the expenses of the receivership. On the basis of an average net income of $1,295,767 for three years and total interest charges of $580,848 there will be available for sinking fund and dividends $714,920. Preferred stock dividends at 5 per cent will require only $523,407.

On the economic side of the matter, certain phases of the litigation between the city and the company are still before the courts on appeal of the city. The most important of these, perhaps, is the question of the duration of the franchise with its 5-cent fare provision. The master fixed a 7½ per cent return on the valuation found by him and held that the 6-cent fare sought to be enforced by the city was confiscatory. Long before this finding was handed down the court entered an interlocutory decree authorizing the receiver to charge not more than 8 cents for adults, with a 7½-cent ticket rate. The receiver has operated on this fare basis. Under it he has been able to put $2,750,000 back into the property out of earnings—an amount almost identical with the interest which has been defaulted on $12,883,859, par value, of bonds and notes. As for the franchise, the lower courts have held that the grants of 1885 and 1888 covering most of the lines are perpetual but that the rates sought to be imposed under them are confiscatory. Judged from both its financial and economic sides the outlook at Denver appears to be auspicious.

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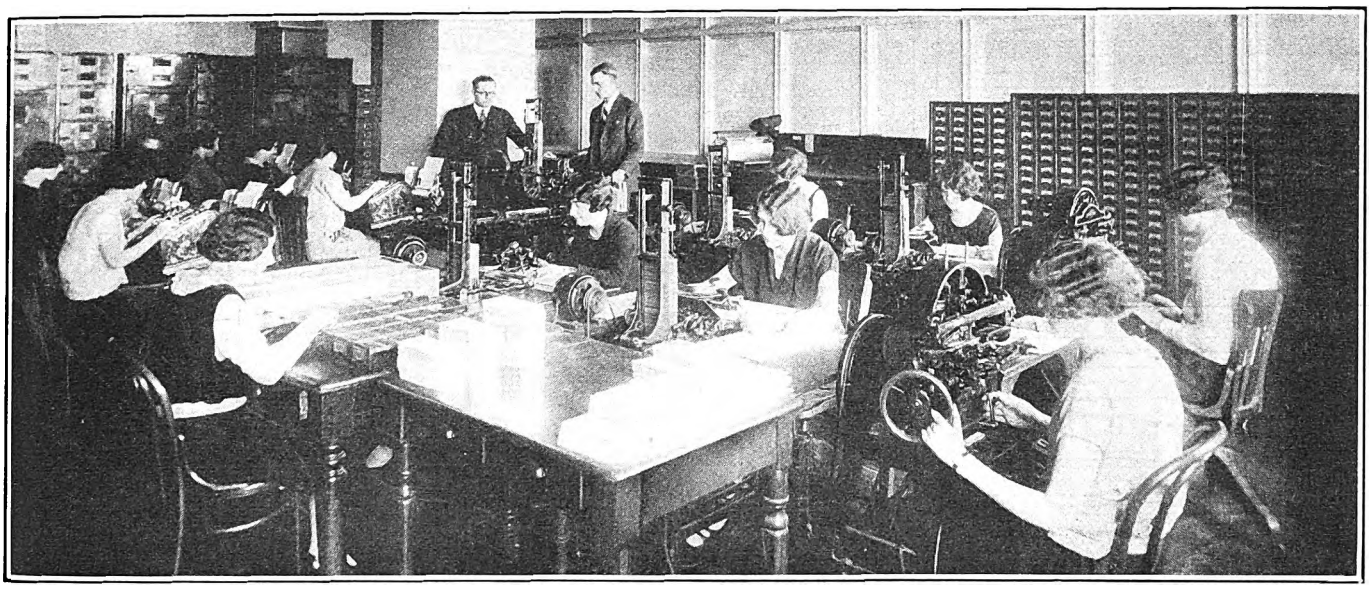
Preparing Transportation Department Payrolls by Machine

On the Boston Elevated Railway Time Cards Are Stamped by Automatic Addressographs at a Rate of 6,000 per Hour—Duplex Adding Machines Total Daily Figures and Transfer the Sum to Weekly Payrolls—Clerical Force Engaged on This Work Has Been Reduced and Errors Eliminated



Preparing Payrolls by Means of Automatic Addressograph and Duplex Adding Machines in the Office of the Boston Elevated Railway. Stencils Are Stored in the Filing Cases at the Right

LABOR-SAVING machinery has been adopted to an unusual extent by the Boston Elevated Railway to perform automatically many of the operations of making up payrolls for transportation department employees. As a result of the adoption of this system the men receive their pay several days sooner after the completion of the week's work than formerly was the case and the number of mistakes occurring in the preparation of payrolls has been reduced to a marked extent. The clerical force employed in the payroll department has been cut down from 40 to 27 and these employees now work five and one-half days a week instead of seven.

Adoption of the present method of preparing payrolls is the outgrowth of a series of events beginning in 1912. Prior to the organization of the trainmen's union in that year transportation department employees were paid a daily rate. After unionization a change was made to an hourly rate. The bureau of audit then arranged forms to be used under the new system.

Methods of using these forms, however, differed widely on the various divisions of the property. In 1914 the work of standardizing the preparation of payroll forms was undertaken. This progressed slowly on account of the many minor variations in practice at the different carhouses. Completion of this work required about two years and was scarcely accomplished before the time came for renewal of the agreement between the railway and the union. Negotiations to this end were begun in May, 1916, but were not concluded until August of that year. At that time additional changes were made in connection with wages of trainmen and this necessitated alteration in the method of making up payrolls.

Representatives of the company, of whom E. H. Chandler, now supervisor of payrolls, was one, made an extended trip across the continent to study the methods employed by different railways in making up payrolls. Twenty-seven properties were visited. Because conditions in Boston differed somewhat from those found elsewhere, certain modifications of the methods in vogue on other railways seemed desirable. A conference was called by J. H. Moran, general auditor, and the problem thoroughly discussed. As a result of this conference the present plan was adopted in 1917 and no changes of any importance have been made to it since that time.

The cornerstone of the system of preparing payrolls is naturally the time-table. In Boston all runs from a single carhouse are listed on the same time-table. Crews operate cars on more than one line during the course of a day's work when schedule making requires such an arrangement. The type of time-table used is shown in an accompanying illustration. From this it will be seen that crews which operate cars on route No. 1047 throughout most of the day make occasional trips on route No. 1070. By this means it is possible to regulate the number of cars in service to the traffic demands at any particular hour and also to arrange the day's work in accordance with the agreement with the men. Eight hours is the regular length of a run, 60 per cent of which must finish within eleven hours and the remaining 40 per cent within fourteen hours.

Prior to 1920 time-tables were so made up that there

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BOSTON ELEVATED RAILWAY

Pay Roll Clerk's Classification of Wages of Transportation Employees

LOCATION Week ending

Charge or Account	SURFACE DIVISIONS	SAT.	SUN.	MON.	TUES.	WED.	THURS.	FRI.	Total for Current Week	Increase or Decrease over Last Year
	Passenger Service									
6410	Operating Scheduled Runs									
6410	Allowances Conductors and Motormen									
6420	Additional Service									
6430	Meeting Cars									
6440	Cover Time									
6450	Special Cars									
	TOTAL COST OF PASSENGER SERVICE									
	Cost per mile									
6460	Instructors Pay									
6470	Wage of Learners									
6480	Time at Supt's. Office, or other reports									
6480	Picking Runs									
6480	Transferring Foreign Cars									
6490	Run Service									
	TOTAL ACCOUNT 64									
6510	Freight Car Service									
6540	News Car Service									
	TOTAL ACCOUNT 65									
1100	Sand Car Service									
6320	Division Office Force and Messenger									
6330	Clerk, at Car Houses and Station Receivers									
6340	Station Master									
6350	Starters, Inspectors and Supervisors									
6380	Traffic Checking									
6390	Traffic Aid									
6610	Switchman or Crossing Tender									
6620	Flagging Cars									
6630	Trail-car Couplers									
6810	Indicator Operators									
6430	Warder									
6830	Janitors									
7310	Telephone Operator									
7810	Wrecking Car Service									
7820	Shifting Cars in Divisions									
7820	Testing Cars									
92500	Payments for Accident Reports									
37401	Albany St. Shops									
30110	Everett Car Shops									
84	Treasury Dept.									
92600	Claim Dept. or Court									
	Maintenance of Way									
	Wire and Conduits Dept.									
1210	Snow Work									
	TOTAL WAGES of CONDUCTORS and MOTORMEN									
	Car Miles, Passenger Cars									
	Freight and Express Cars									
	Sprinkler Cars									
	News Cars									
	Total Car Miles									

BOSTON ELEVATED RAILWAY Station 192

WORK SHEET OF COVER MEN

CHECK Miss	CHECK OS	CHECK Sick	BADGE	NAMES	Occupation		Schedule Run No.	COVER PERIOD From	COVER PERIOD To	PERIODS AND KIND OF WORK From	To	From	To	From	To	From	To
				- SUNDAY -													
			1495	MEHEGAN J.	M	.725											
			1158	SWEENEY J.F.													
			1268	SHEEHAN T.F.													
			1348	JACOBS F.H.													
			1453	SWEENEY E.													
			1101	CAREY J.F.													
			1542	RYAN J.													
			1022	LYNCH W.J.													
			1546	CAMERON D.A.	M-O	.725											
			1553	NICKERSON A.D.	M-O	.725											
			1549	LANEGAN T.J.	M	.725											
			1519	REGAN J.L.	M	.725											
			1472	FISHER J.A.	M-O	.725											
			1545	LYONS T.J.	M	.725											
			1196	RUSH R.	M-O												

Form 3726-1 SUSPENDED—EXCUSED—SICK—LAID OFF—RESIGNED—DISCHARGED—ABSENT—APPOINTED—SIGNED

TRANS. TO TRANS. FROM RETURNED FROM REEMPLOYED

SUBSTITUTE'S NUMBERS

4023 SWAIN T.H. C-O .725

#3 O 5.17 O11.22 8.08

#43 M 8.43 M 3.34 10.17

SATURDAY APR. 25 1925

A.M. START	A.M. STOP	P.M. START	P.M. STOP	A.M. START	A.M. STOP

Sch.	Time	Hours	Min.	AMOUNT	DESCRIPTION
					Schedule Runs
					Outside Time Allowance
					Instructor's Pay
					Accident Report
					Cover Time
					TOTAL

COVER PERIOD

I hereby certify to correctness of time shown hereon.

BOSTON ELEVATED RAILWAY

DEPARTMENT TRANSPORTATION
LOCATION DIV. FOUR, EVERETT 643
PAYROLL OF CONDUCTORS

AUDITOR'S No.
WEEK ENDING APRIL 17, 1925
PAYMASTER

	Badge No.	NAME	Occupation	RATE	TIME WORKED	TOTAL WAGES	Receipt of the Boston Elevated Railway the sums set opposite our respective names in full for services rendered as specified.	WITNESS
1	4023	SWAIN T.H.	C-O	.725				
2	4047	O'LEARY F.J.	C-O	.725				
3	4076	BREWER C.L.	C-O	.725				
4	4161	FARRIS J.D.S.	C-O	.725				
5	4195	FRASER G.W.	C-O	.725				
6	4213	COHEN S.	C-O	.725				
7	4210	RUSH R.						

Time Is Saved and Accuracy Promoted by Having These Forms Filled Out as Far as Possible by Machine

BOSTON ELEVATED RAILWAY

RUN GUIDE DIVISION FOUR EVERETT (643) IN EFFECT

Change of Time—New Time Table No's. Weekday Saturday Sunday Holiday

Repicking of Same Time Table No's. Weekday Saturday Sunday Holiday

RATING ORDER	BADGE	NAMES	Occupation	RATE	WEEK DAY Run or Position	SATURDAY Run or Position	SUNDAY Run or Position	HOLIDAY Run or Position	VACANT RUNS OR POSITIONS
	4023	SWAIN T.H.	C-O	.725					
	4047	O'LEARY F.J.	C-O	.725					
	4076	BREWER C.L.	C-O	.725					
	4161	FARRIS J.D.S.	C-O	.725					
	4195	FRASER G.W.							

Form 6358-7-24-20m 100

BOSTON ELEVATED RAILWAY

Location Week Ending

REPORT OF ADDITIONAL NAMES PLACED ON PAY-ROLL, CHANGES IN CLASSIFICATION, RATE, ETC.

Employee Number	NAME	Occupation Number	OCCUPATION	Sub-Location	RATES Flat	RATES Overtime	State authority for all names added, changes in occupation or rate and if previously employed state when and where.

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were a large number of extra men who received a minimum daily wage. In 1920, however, "additional" runs not counted in the percentages mentioned above were created, with short morning and night pieces and "cover time" between. Besides these "additional" runs there are still certain extra or "cover" men who receive a minimum eight-hour daily wage, but their number is much less than before. Time-tables are prepared subject to these conditions and the total time of motormen and conductors is listed in the manner shown.

An addressograph stencil is then prepared showing in the first line the employee's badge number, his name and his rate of pay. The latter item depends upon length of service. The second and third lines show the time on and off as well as the total hours and minutes spread-time. This information is stamped by an automatic addressograph machine on a card of the type shown in an accompanying illustration. A card of this type is prepared for every man every day and sent to the carhouse in advance of the date required. Saturday and Sunday schedules differ materially from weekday schedules and separate addressograph stencils are prepared for them. No cards are prepared in advance for holidays because the amount of service to be operated cannot be foretold accurately in advance, depending as it does almost entirely upon the weather.

Space is provided on the daily time card for notations concerning any changes from the regular routine of work. If no such change occurs, however, the time clerk at the carhouse needs only to initial the card as being correct. Every morning the cards for the previous day are sent in to the payroll office. No addressograph stencils are used for the cover men because the character of their work and their hours vary so greatly from day to day. To aid the payroll department in giving proper time credit the carhouse makes up a sheet listing the work of cover men.

Duplex adding machines are used to sum up hours and pay shown on the seven daily cards which represent a week's work. The tape of the adding machine is retained in the office as a permanent record and the total is transferred to the weekly payroll. For this purpose a form is used as shown in an accompanying illustration.

In preparing the payroll sheets the same stencils are used as for making out the daily time cards except that a guard is slipped over the lower portion of each stencil, and the time on and time off is, therefore, not printed. Stamping of the daily cards is done at the rate of 6,000 per hour. As there are some 4,000 platform men and 1,000 station and other miscellaneous transportation employees 35,000 cards per week are used.

Three stencils are used for each man, one for weekdays, one for Saturdays and one for Sundays. These are stored in filing cases, as shown in the accompanying illustration of the room where the preparation of the cards is done. The labor turnover on the Boston Elevated Railway, however, is comparatively small, being only 4 per cent in 1924, and the stencils are useful for a considerable time. According to agreement with the union, however, runs are picked every three months and that usually necessitates the preparation of a new stencil. Moreover, schedules are frequently changed in between the dates of picking runs. This also may necessitate changes in the stencils.

When a new time-table goes into effect each carhouse prepares and sends in to the payroll department a form known as a run guide, showing the number of the run which each man has picked for weekdays, Saturdays, Sundays and holidays. In addition to this a report is made each week showing the additional names placed on the payroll, changes in classification, rate of wages, etc., or the names of employees dropped from the payroll.

Despite the large number of calculations required in the preparation of payrolls very few errors are made. There are three calculations per card and more than 100,000 calculations per week. Mistakes, however, average only about 75 for each weekly payroll. From the payroll office the cards go to the auditor's office and are there checked up. Only about five mistakes per week escape detection by the bureau of audit.

A somewhat serious problem is created by the rapidity with which these cards accumulate. It is the practice to keep the cards for seven years. Those for the preceding three or four weeks are kept on hand in the payroll office and after that time they are sent to the storeroom, where they remain available if needed.

WEEKDAY TIME TABLE NO. 103 NORTH POINT CAR HOUSE. IN EFFECT ,192

RUN NO | REPORT TIME | SHEET 2 | ROUTE 1035 BAY VIEW-ESSEX + WASH. STS. | SUPERSEDING NO. 186 | LENGTH OF DAY | PLATFORM TIME | TOTAL M.M. | TIME COND.

ROUTE 1047
COVER ST. — BERKELEY + BOYLSTON STS.

RUN NO	REPORT TIME																										
91	555	A1070	600	615	645	710	740	1070 ----	871			959	1000	1030	1100	1130	1200	1230	100	130	200	230	313	913	735	745	750
			633	658	728	756	807						1019	1049	1119	1149	1219	1249	119	149	219	249					
92	540	A1070	545	600	630	700	730	800	830	900	930	959				1017 ----	----	----	----	----			340	955	802	812	817
				618	644	716	746	819	849	919	949					1152	1840	186	216	304							
93	701	A1070	706	720	750	815	845	915	945	1015	1045	1115	1145	1215	1245	116			0905	0905	0905		605	1059	741	751	756
				738	804	833	904	934	1004	1034	1104	1134	1204	1234	104				432	506	540						
94	120	1066	126	215	305	353	0946	1066 527	606				814	815	845	915	945	1015	1045	1070 ----			1129	1004	756	806	811
							446						834	904	934	1004	1034	1104	1115								
95	939		245	315	345	415	440	510	540	1070 ----	621			800	830	900	930	1000	1030	1100	1070 ----		1144	900	722	732	737
			304	334	404	434	459	524	556	607				819	849	919	949	1019	1049	1119	1130						

ROUTE 1066
BROADWAY + DORCHESTER AVE — SOUTH STA "L"

101	715	ⓒ	1046										1017	1021	09-05	09-05											
			720	825	932	1038	1144	1240					316	413	453	537											
102	719		724	809 811	855	934						1215	105	155	245	335	419	09.46 512					552	1032	756	806	811

Typical Time-Table Used by the Boston Elevated Railway

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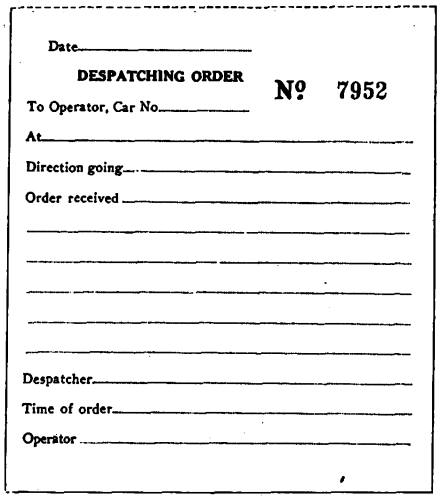
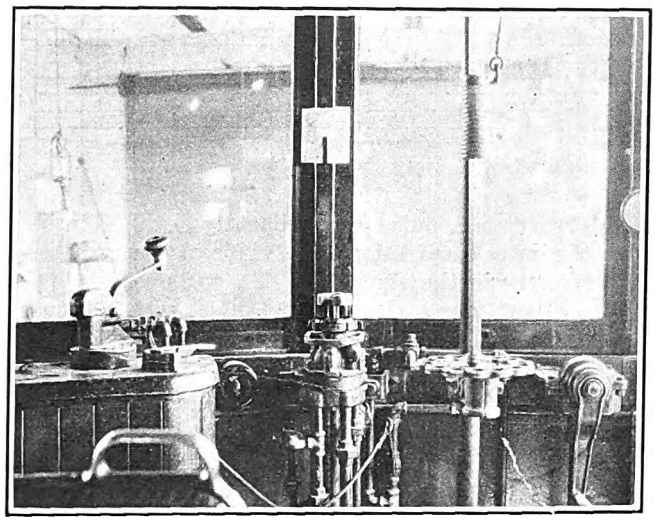
Telephone Dispatching on Shore Line Railway

A Duplicate Train Order Is Carried Under a Clip on the Vestibule Window Post in Full View of the Operator

WHEN the New Haven & Shore Line Railway was rehabilitated in 1923 and operation was resumed under the present management after a four-year cessation, there were no signals on the property, its predecessor company having preferred to use telephone dispatching. Not wishing to make a large outlay to install signal equipment the new management decided to continue the telephone dispatching system, but several important changes have been made in it. This railway operates a 34-mile single-track line between New Haven and Saybrook. The run is made in two hours, and as the headway is one hour under normal conditions there are four cars on the road.


Date
DESPATCHING ORDER
No 7952
To Operator, Car No.
At
Direction going
Order received
Despatcher
Time of order
Operator

Dispatching Order Form Used by Shore Line Railway



Dispatching Orders Are Attached to the Front Vestibule Window Post Directly in Front of the Operator

Fourteen turnouts are located along the line averaging about 2½ miles apart. The schedule calls for positive meets at Guilford, the mid-point of the line, and at turnouts between that point and the two ends of the line. Headquarters of the railway are now located at Guilford instead of at Saybrook as was the case formerly. All turnouts are connected by telephone with the dispatcher's office at Guilford. When cars are on time no calls are made excepting when the day operator is relieved. It is a standing order that relief operators report to the despatcher before commencing their runs. In case of trouble they telephone from the nearest instrument.

A daily dispatcher's report of the kind shown in an accompanying illustration is used. Each telephone booth is equipped with a pad of dispatching orders which are written out by the operator when he receives his instructions from the dispatcher. The wording of the dispatching order follows the wording of the dispatcher's report, which is written during the telephone conversation.

Duplicating pads are used at the telephone stations. The original order is then slipped under a clip on the left-hand front vestibule window post where it is directly in front of the operator until executed. A pink carbon copy is dropped into a locked box in the telephone booth. Under this arrangement the dispatcher's report, the operator's order and the carbon copy should agree in every detail. In case of any confusion as to the meaning of orders it is possible accurately to trace the responsibility.

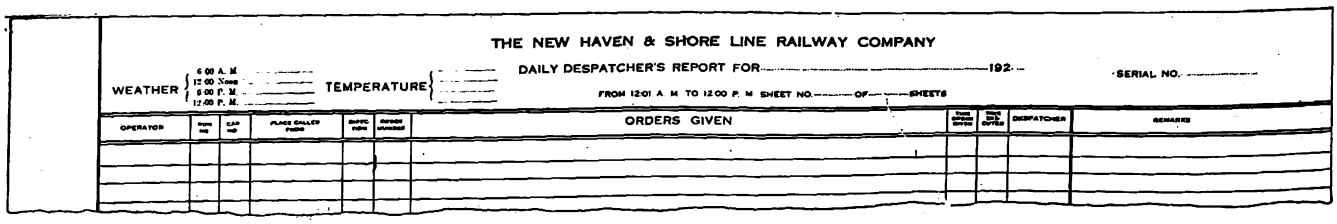
Trainmen Talk Safety to Passengers

SAFETY EDUCATION WEEK was observed in Nashville, Tenn., from May 3 to 9. The Nashville Railway & Light Company, feeling it to be the company's civic duty to assist in this movement and also recognizing the opportunity afforded to further good will and bring about a closer friendly relationship with its patrons, trained seven car operators to deliver four-minute talks on its cars.

The training of the platform employees extended over a period of ten days previous to the opening of Safety Education Week. On Monday morning, May 4, these operators boarded cars during the rush hours from 6 to 9 a.m. and 3 to 6 p.m., and delivered the talks from the front platform. The talks were so scheduled during the week that a speaker addressed the passengers on every car operated during the peak periods of riding in the morning and afternoon.

The Nashville Railway & Light Company operates a maximum of 146 cars and transports approximately 35,000 passengers during the rush-hour period. By dividing the system into divisions, the speakers boarded cars on four routes during the morning rush hours and on four other routes during the evening rush hours each day. In this way, practically every patron was reached by at least one talk during the week.

Speakers on practically every car were applauded and many passengers shook hands with the speakers and complimented them at the close of their addresses. Favorable newspaper comment was also received.


THE NEW HAVEN & SHORE LINE RAILWAY COMPANY
DAILY DESPATCHER'S REPORT FOR 192
SERIAL NO.
WEATHER 6:00 A. M. 12:00 Noon 6:00 P. M. 12:00 P. M.
TEMPERATURE
FROM 12:01 A. M. TO 12:00 P. M. SHEET NO. OF SHEETS

OPERATOR						ORDERS GIVEN			DISPATCHER	REMARKS

The Wording of the Dispatcher's Report Form Is Identical with That of the Order Written Down by the Car Operator

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Three Motive-Power Units Are Coupled Together Semi-Permanently to Form the Largest Locomotive in the World

Economies Expected from Electrification of Virginian Railway

Largest Locomotives in the World, Equipped with Split-Phase, Constant-Speed Electric Motors, Will Haul Heavy Coal Trains Over Severe Mountain Grades—Automatic Renegeration Is Provided—Electric Operation on 133 Route-Miles Will Be Inaugurated This Year

ELECTRIFICATION of the Virginian Railway from Mullens, W. Va., to Roanoke, Va., is progressing steadily and it is expected that electric operation of this section will be inaugurated before the end of 1925. About 133 route-miles or some 213 track-miles will be included in the undertaking, the cost of which will be about $15,000,000 as outlined in ELECTRIC RAILWAY JOURNAL for May 5, 1923, page 777. Substitution of powerful electric locomotives in place of the present steam locomotives is expected to result in important operating economies.

The Virginian Railway was built for the sole purpose of moving coal from the New River and Pocahontas fields to tidewater at Norfolk. Heavy rolling stock and long trains have always been characteristic of its operation. The part of the road which is being electrified has offered particularly difficult operating problems because of the heavy grades. East of Roanoke the grades are easy and the movement of trains on this part of the road has never presented serious difficulties.

Nearly all of the Virginian coal tonnage originates west of Elmore. At present, trains of approximately 5,500 gross trailing tons are made up in the yard between Mullens and Elmore and are moved up the 2 per cent grade between Elmore and Clark's Gap by means of a road engine and two pushers. The combined weight of the locomotives in this train, including their tenders, is approximately 1,270 tons, and their combined tractive effort rating is 409,400 lb. From Clark's Gap the 5,500-ton train is taken into Princeton with the single road engine. Princeton is a terminal point under steam operation and trains of 8,000 trailing tons are operated from there to Roanoke with one road engine, two switchers to start out of the yard and a pusher up the grade between Whitehorne and Merrimac.

Under electric operation coal trains will be made up in the Mullens-Elmore yard with an electric road engine at the head end of the train and a similar pusher at the rear end. These will handle 6,000 gross tons from Elmore to Clark's Gap. The speed will be 14 m.p.h., which is at least double that obtained at present with steam. At Clark's Gap the train will be increased 50 per cent to 9,000 tons, and one electric locomotive will take it from there to Roanoke. It will not be necessary to use pushers out of Princeton nor up the Whitehorne grade.

Westbound trains will consist almost entirely of empty coal cars and will be handled with one road locomotive at a speed of 28 m.p.h. except from Fagg to Merrimac,

SPECIFICATIONS OF VIRGINIAN LOCOMOTIVE UNIT

Total weight of unit	425,300 lb.
Classification of wheels	2-8-2
Weight on drivers	309,300 lb.
Number of driving axles	4
Number of idle truck axles	2
Capacity at one-hour rating	2,030 hp., 14.1 m.p.h. 2,375 hp., 28.3 m.p.h.
Starting tractive effort at 25 per cent adhesion	77,325 lb.
Maximum starting tractive effort at 29.9 per cent adhesion	92,500 lb.
Tractive effort—hourly rating	54,000 lb. 14.1 m.p.h. 31,500 lb., 28.3 m.p.h.
Speed—hourly rating	14.1 m.p.h., 28.3 m.p.h.
Tractive effort—continuous rating	45,000 lb., 14.2 m.p.h. 26,250 lb., 28.4 m.p.h.
Speed—continuous rating	14.2 m.p.h., 28.4 m.p.h.
Maximum speed	38 m.p.h.
Total wheelbase	37 ft. 6 in.
Rigid wheelbase	16 ft. 6 in.
Length over all (between pulling faces of coupler knuckles)	50 ft., 9 in.
Width over all	11 ft., 3 in.
Height from rail to locked position of pantograph	16 ft., 0 in.
Diameter of driving wheels	62 in.
Diameter of idle truck wheels	33 in.
Voltage and type of contact line	11,000 or 22,000-volt, single-phase overhead
Number and type of motors	Two type 452-A
Method of drive	Flexible gears, jackshaft and siderods
Gear ratio	21:100
Type of control	Electro-pneumatic (HB)

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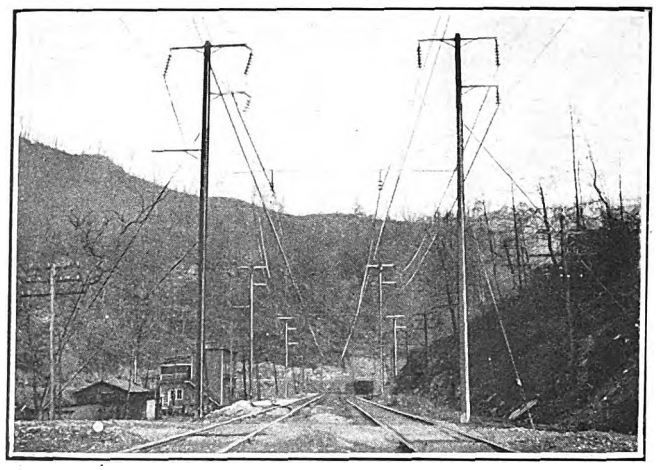


Typical 11,000-Volt, Single-Phase Overhead Line Construction

from Kellysville to Princeton, and from Rock to Elmore. The weight of these trains will be about 2,800 tons.

To haul these heavy trains over the severe mountain grades the largest locomotives in the world will be used. Each of these consists of three semi-permanently coupled motive-power units. Thirty-six units, or twelve complete locomotives, are being built by the Westinghouse Electric & Manufacturing Company. These are of the split-phase constant-speed type. Current is taken from the 11,000-volt overhead wire through a pantograph to the main transformer. Single-phase power is changed into three-phase power by the main transformer and a rotating phase converter, whence it is fed to the motors. The latter are induction motors arranged for two comparatively constant running speeds of 14 and 28 m.p.h.

Acceleration to the running speeds is obtained by varying the resistance in the secondary circuit of the motors, a liquid rheostat being provided for this purpose. The amount of resistance is determined by the height of the electrolyte in the rheostat, and this is directly controlled by the engineman through the master controller. The master controller essentially consists of two parts, a speed drum for changing the motor connections to secure the desired running speed, and an acceleration drum. An auxiliary controller is provided in which are placed switches for operating the pantograph, buttons for independent operation of the different rheostats, and a button for tripping the circuit breakers.

An interesting feature of these locomotives is the oil-insulated, force-cooled transformer. Oil is continuously circulated through a special radiator by a motor-driven centrifugal pump, and air for the radiator is supplied by a blower driven by the same motor which drives the pump. By using this type of transformer, the advantages of the oil-insulated transformer are secured without the space required by the self-cooled type.

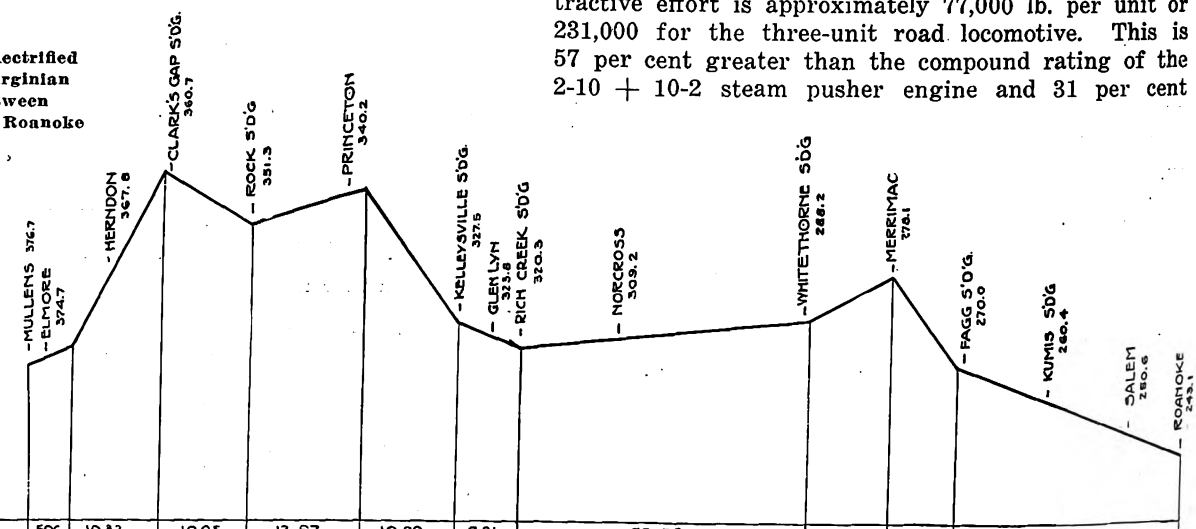
The locomotives are automatically regenerative. When descending a grade of such degree that the net tractive effort becomes negative, the motors become generators and return power to the line. Thus, it is necessary to use the air brakes only to bring the train to a complete stop. This results in no inconsiderable saving in brakeshoes and brake rigging maintenance.

While the motive-power units will at first normally be used in groups of three as road locomotives, the control, which is of the electro-pneumatic type, is arranged to permit the operation of four cabs together. Thus future traffic conditions are amply provided for, both from the standpoint of power supply and locomotive capacity.

Each motive power unit has the Mikado or 2-8-2 wheel arrangement, the weight per cab being approximately 425,000 lb., so that the weight of the three-cab road engine is 637.5 tons. Each driving motor has mounted at each end of the shaft a pinion which meshes with a flexible gear, and the gears are mounted on a jack shaft, the power being transmitted from the gear centers to the drive wheels by means of side rods.

Maximum tractive effort of each motive-power unit as limited by electrical capacity is 92,500 lb., which occurs at an adhesion slightly under 30 per cent. At the conservative starting adhesion of 25 per cent the tractive effort is approximately 77,000 lb. per unit or 231,000 for the three-unit road locomotive. This is 57 per cent greater than the compound rating of the 2-10 + 10-2 steam pusher engine and 31 per cent

Profile of Electrified Section of Virginian Railway Between Mullens and Roanoke



MILES *		506	10.32	10.05	12.97	10.90	7.21	32.72	9.51	7.43	27.56
ELEVATION		1427.03	1528.42	2525.90	2237.61	2438.16	1674.13	1534.95	1707.65	1966.32	1445.86	926.0
COMPENSATED GRADE PER CENT.	EAST	+.531	+1.979	- 396	+.402	-1.259	-.340	+.168	+.585	-1.252	-.313
	WEST	-.228	- 1.681	+ 710	- 198	+1.395	+.391	-.024	-.475	+1.400	+.401
MAXIMUM GRADE %		1.21	2.11	1.25	0.60	1.50	0.808	0.20	0.60	1.5	0.9
AVER. CURVE Deg		3.79	3.73	3.93	2.55	1.70	0.64	1.80	1.35	1.85	1.10
MAX. CURVE Deg		12°	12°	12°	8°	8°-10'	3°	8°	8°	8°	8°
MILES from NORFOLK (From Mile Posts)		316.13	371.67	361.56	351.33	338.40	327.49	310.29	297.99	278.10	270.67	243.11

* SURVEY EQUATIONS INCLUDED

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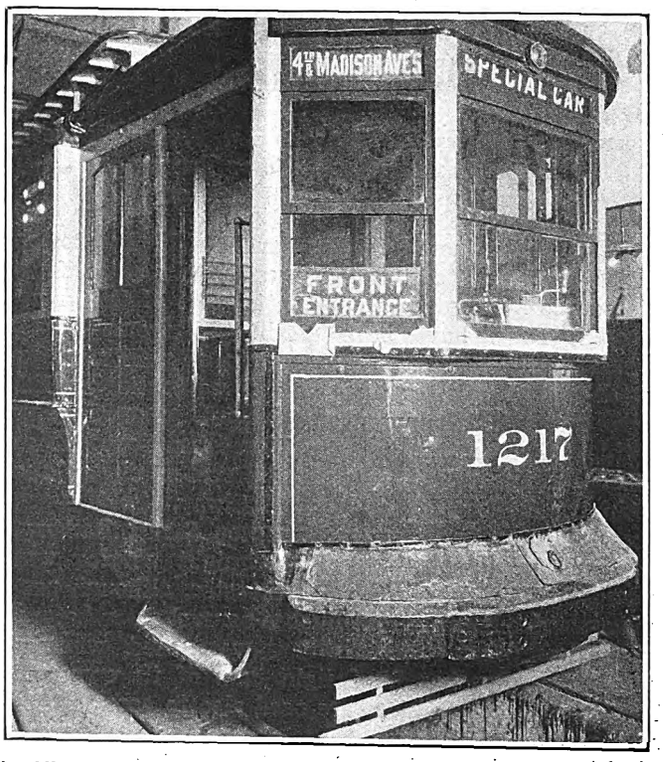
greater than the simple rating. The continuous tractive effort of the three-cab locomotive is 135,000 lb. at 14.2 m.p.h. and 78,800 at 28.4 m.p.h.

Power for the electrification will be supplied from a power plant being constructed at Narrows, Va. From this new station power will be fed both ways on 88,000-volt transmission lines and from these lines to the overhead catenary system by means of transformer stations located along the right-of-way. To provide for the application of greater power to trains with growth of traffic the transformer stations, trolley line, and locomotives have been designed for a voltage of either 11,000 or 22,000.

The principal savings due to electrification will be reduced maintenance of equipment costs and the transportation expense. A considerable reduction in each of these accounts is expected. The cost of maintaining steam locomotives, of the type used by the Virginian, is heavy on account of expensive boiler and firebox repairs which cannot be avoided. Electric locomotives have no similar inherent maintenance expense.

Costs of electric energy for the trains will be less than the cost of coal for steam locomotives. This is due to the more efficient burning of the coal in the power house and to the absence of large standby losses, which are of necessity a part of steam locomotive operation. This reduction in energy cost, however, is offset by the maintenance and depreciation of the transmission and distribution system.



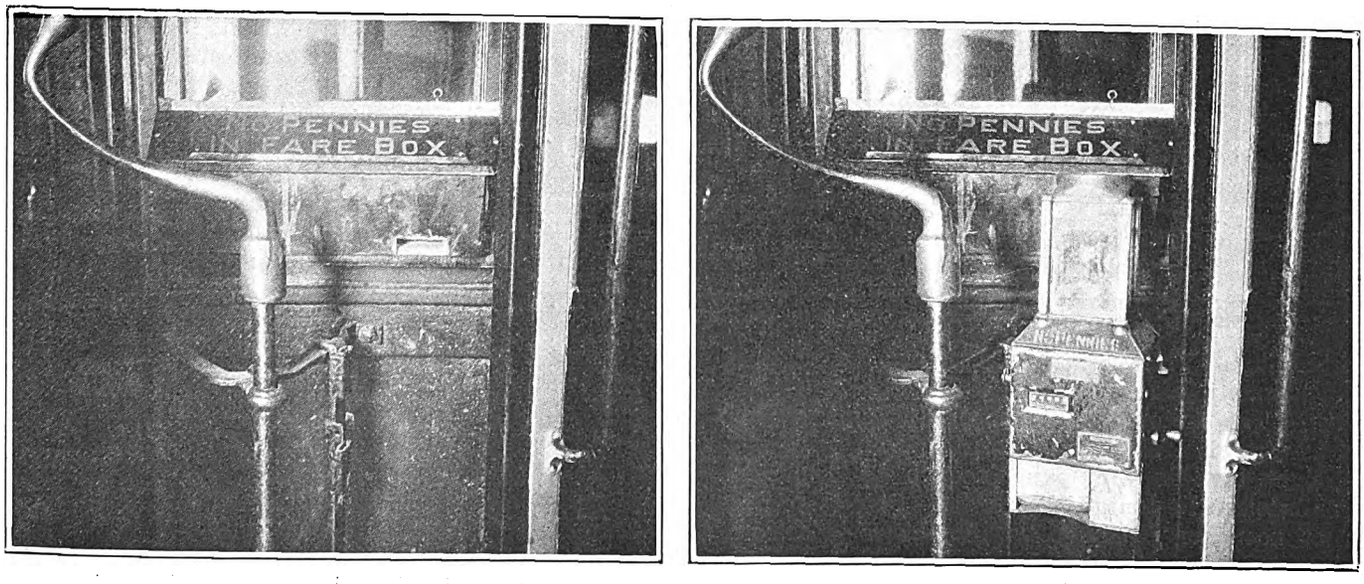
An Illuminated Sign Is Used in the Lower Right-Hand Window to Indicate that Entrance Is at the Front

Using Sign Lights to Illuminate Fare Box

SOME of the cars used by the New York & Harlem Railroad, New York, N. Y., are arranged for either one-man or two-man operation. When used on one-man cars the fare box is located against the front end just to the right of the entrance. An illuminated sign is displayed in the lower right-hand window. In one-man operation the sign reads "Front Entrance," and when operated by two men the sign is changed to "Enter at the Rear."

By locating the fare box near this illuminated sign the same lamp that is used for the sign lighting illuminates the fare box. A slot has been cut in the box which incloses the sign, and the fare box is installed so that the lower edge of the top is just above this slot. The light from the lamp in the sign box passes through the opening and illuminates the change tray in the fare box. An accompanying illustration shows the hole in the sign box and the fare box in position.

The Chicago Surface Lines, Chicago, Ill., adopted a new and distinctive headgear for supervisors to increase their utility to the public. Flare caps, resembling those of the traffic policemen alongside whom they work, have replaced the regulation company hats. A big number shield like that worn by members of the police department spreads across the front. The supervisors have become noticeable figures with a big part to play in expediting loading and offering solicitous attention to patrons.



At Left, a Slot at the Bottom of the Box for the Illuminated Sign Permits Light to Pass Through to Illuminate the Fare Box; At Right, Fare Box in Position Illuminated from Lamp in Sign Box

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Interline Freight Traffic Development

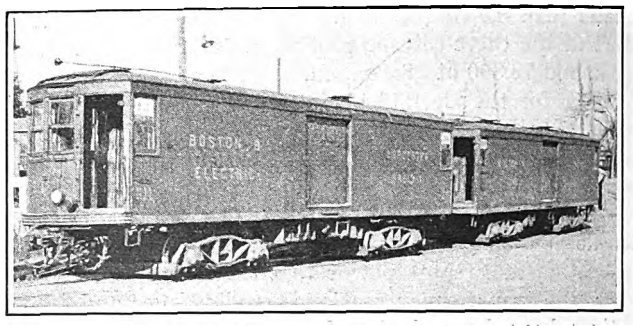
Overnight Delivery Is Made to All Points Between Springfield and Boston—Motor Trucks Are Used for Pick Up and Delivery

FREIGHT business has been developed by the Boston & Worcester Street Railway until the revenue from this source now forms a substantial part of the gross. Through rates have been established from Lowell, Lawrence and Boston on the east to all points on the Boston and Worcester lines as well as to Springfield, Holyoke and Northampton on the west. Participating in this joint service are the Worcester Consolidated Street Railway, the Springfield Street Railway, the Fitchburg & Leominster Street Railway, the Holyoke Street Railway and the Northampton Street Railway.

It was not until 1913 that freight service was inaugurated by the Boston & Worcester, although passenger service had been established several years before. At the beginning only four cars were used, whereas the railway now has 22 freight cars of its own and the cars of other carriers are used also to some extent in interchange service.

Rolling stock consists of fourteen motor cars and eight trailers. These are 45 ft. long and are equipped with automatic air brakes and Brill arch-bar freight trucks. The motor cars have multiple-unit control. Two-car freight trains are operated.

Freight stations are maintained in all important towns between Boston and Worcester. Cars leave Boston at noon for Framingham, Southboro, Marlboro, Hudson and Worcester. Other cars leave at 6 p.m. for those points and also for Wellesley Hills, Natick, Fayville, Westboro and Shrewsbury. Eastbound cars leave Worcester at 2 p.m. and at 5 p.m. Possession of a double-track line all the way from Boston to Worcester makes it possible to operate freight service independently of the passenger schedule. Motor trucks operate out of Boston to serve Lowell and Lawrence.



Two-Car Freight Trains of This Type Are Operated by the Boston & Worcester in Conjunction with Five Other Electric Railways in Massachusetts

Shipments from points on the Boston & Worcester lines are accepted only to points within the state of Massachusetts and vice versa. Freight received at the terminal in Boston at 5:30 p.m. is delivered to all points on the lines of the company and also in Springfield by 7 a.m. In Holyoke and Northampton delivery is made before 10 a.m. Two general methods are followed in making shipments, station to station and pick-up and delivery. An arrangement has been made with local trucking companies to assist with the latter class of business.

Charges are based on the kind of material handled and on the distance. A minimum charge of 50 cents is made. The general scheme followed is shown in the accompanying table. Rate reference numbers refer to the zone in which the point of delivery is located and class numbers to the character of the material.

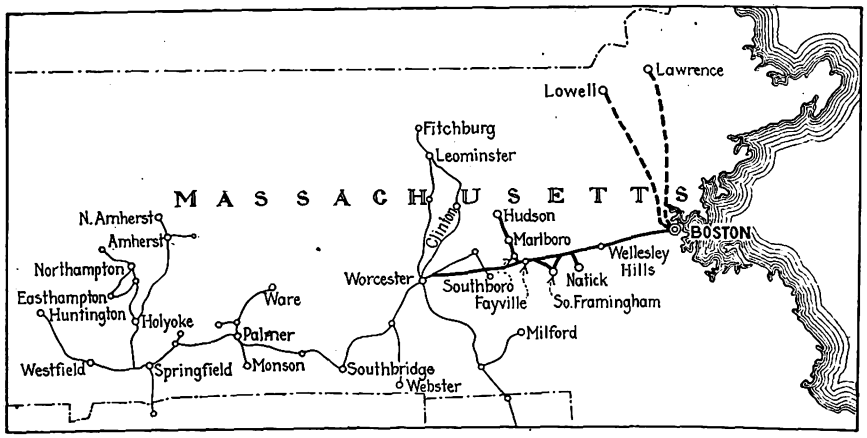
Westbound from Boston the railway has an average of 25 carloads of freight per day. Miscellaneous local freight constitutes the bulk of the business. Some carload lots of barreled sugar are carried. Shoes are shipped in large quantities from the manufacturing towns of Marlboro and Hudson. Much leather is also carried inbound to those towns. It is the practice also to spot cars for local express companies, the latter loading and sealing the cars. Eastbound the traffic is somewhat lighter than westbound.

Freight traffic on the Boston & Worcester increased every year from 1913 up to 1924. Last year a slight decline occurred due to the general business depression in this district. Now, however, the traffic shows signs of picking up again.

Unregulated motor truck competition has been injurious to the freight business of the electric railways in Massachusetts. Had all of the traffic of this kind which has at various times been routed via the Boston & Worcester line been retained, the present volume would be double what it is. It is thought by the railway management that truck competition is not profitable to its operators. In support of this opinion is the rapidity with which these undertakings change ownership. Moreover, the trucks are comparatively lightly taxed. Public sentiment in favor of heavier taxation for motor truck freight carriers is increasing and it is hoped by the management that in the future the railways will be given better protection.

TABLE OF CLASS RATES FROM BOSTON IN CENTS PER 100 LB.

Rate Reference Number	Classes 1	2	3	4	5	6	Rule 25	Rule 26
6	45	37	32	25	20	20	32	26
7	50	41	33	25	20	20	36	27
8	50	42	34	25	20	20	36	27
9	50	43	36	27	23	23	37	29
10	51	44	36	27	23	23	39	29
11	53	44	36	27	24	24	39	29
12	54	46	36	27	25	25	39	29
13	56	47	37	28	25	25	40	30
14	56	47	37	29	25	25	41	30
15	57	49	38	29	25	25	41	31
16	58	49	39	29	25	25	42	31
17	58	50	39	29	28	28	42	31
18	59	50	40	30	28	28	43	32



Area of Central and Eastern Massachusetts Covered by Interline Freight Service

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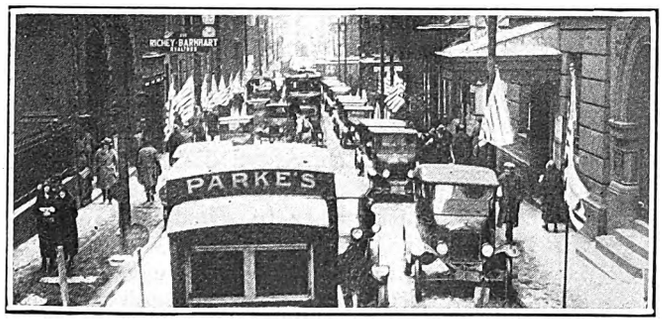
New Traffic Regulations Aid Railway Operation in Pittsburgh

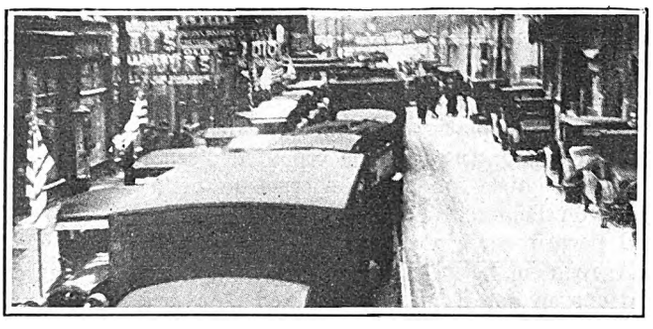
Elimination of Parking on Nearly All of the Streets Where Cars Operate in the Congested District Has Speeded Up Service — Construction of a Half-Mile Extension Will Make Possible Still Further Improvement Through Rerouting— Co-operation of the Public Was Instrumental in Securing Adoption of the New Plan

PROHIBITION of parking alongside of railway tracks in the downtown business section of Pittsburgh has effected a notable improvement in transportation service. The present regulations governing the matter of parking are strict, and they are rigorously enforced. Nevertheless there has been but little objection raised against them. This is largely because the Pittsburgh Railways secured the indorsement of all the more important civic bodies before the plan was put into effect.

Prior to the adoption of the no-parking plan, a short-looping scheme for street cars had been proposed by the company, as told in ELECTRIC RAILWAY JOURNAL for Nov. 22, 1924, page 899. It was pointed out by the management that there had been but three major changes in the street locations and widths in the Golden Triangle, as the congested district in Pittsburgh is known, since the first horse car was operated in 1859. At that time the city had a population of 77,000. The present population of the city is nearly ten times that number.



On Narrow Streets Traffic Movement Was Seriously Impeded by Lack of Adequate Regulations



When Parking Was Permitted All Moving Traffic Used the Car Tracks

The Golden Triangle has an area of only 218 acres, of which 63 acres or approximately 30 per cent are utilized for streets and alleys. Into the narrow confines of this area is poured every day a tremendous volume of vehicular traffic. A check taken in 1917 showed 47,321 vehicles entering and leaving the Triangle daily, not including street cars. A similar check in 1920 showed 60,519 vehicles, an increase of 25.6 per cent. In December, 1923, a similar check showed 82,840 vehicles, an increase of 33 per cent. Figures for 1923 showed a growth of 74 per cent over those for 1917.

Eight years ago the maximum number of vehicles remaining or parking in the Triangle at any one time was approximately 2,500. By 1923 it had reached 6,656, an increase of 166 per cent. Just prior to the enactment of the new regulations the number was even larger.

Besides the increasing number of vehicles entering this area every day the major causes of congestion were the narrowness of the streets, bad street intersections (the Triangle has comparatively few streets running straight through and many intersect at angles, making the flow of traffic difficult), parking of commercial and pleasure automobiles, and the number of vehicles and streets cars making left-hand turns.

The situation had reached a point where it was a menace to the future of downtown Pittsburgh. Although the ultimate remedy was thought to be the establishment of a rapid transit system, it was desired to take some preliminary steps to relieve congestion until such facilities could be provided. Two temporary measures were suggested as possible methods of relieving conditions. These alternatives were, first, the prohibition of parking within the congested area, or second, the removal of street cars from that district.

It was to accomplish the second of these objects that the Pittsburgh Railways suggested the short looping plan. This would have created seven major and two minor loops for street cars in the Golden Triangle. In only two instances would there have been overlapping of important loops in a way that might have caused traffic congestion. The various loops were scattered along the outer edge of the congested district as shown on the accompanying map. From an operating point of view this routing possessed several important advantages. On the other hand, many persons going downtown would have been obliged to walk several blocks to reach their ultimate destinations, and to walk the same distance to reach a street car when homeward bound.

Approval of this plan was granted by the Traction Conference Board on Jan. 31, 1924. Protests were made, however, by the Pittsburgh Real Estate Board, the Downtown Business Men's Association, the Retail Merchants Association, and the Water Street and Lower Downtown Triangle Improvement Association. Their objections were based on fear of losing business if the cars were relegated to the outskirts of the congested district. These bodies suggested certain modifications

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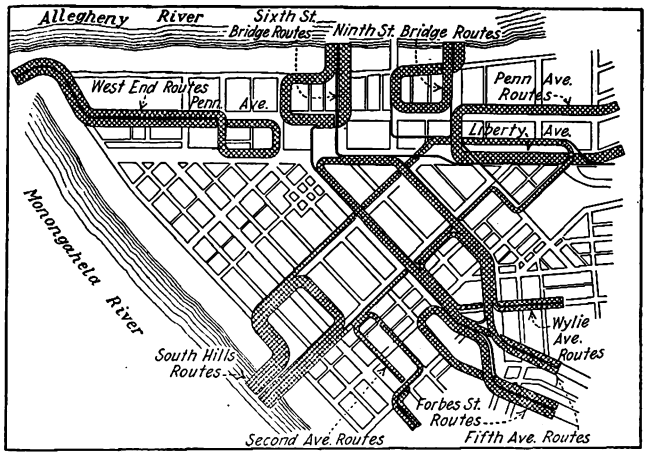


Short-Looping Plan First Proposed by Pittsburgh Railways to Reduce Congestion in the Downtown District

in the plan and conferences were held between their representative and officials of the railway. As a result of numerous conferences of this kind a modified plan was prepared.

Four principal provisions were included in the amended plan. These were:

1. New traffic ordinances embodying no-parking regulations on the principal trolley streets in the downtown district.

2. A larger number of traffic officers to enforce the regulations.

3. Establishment of a new system of tagging automobiles for violation of the ordinance, and increasing the amount of the fine for repeated offences.

4. Franchise for the construction of a new single track on Diamond Street to complete a separate loop, and permit certain changes in car routes.

Agreement between the railway and the various associations on details of the modified plan was reached on Feb. 14, 1925. This was subsequently referred to and approved by the Traction Conference Board and the City Council. Approval for the stringent no-parking regulation was secured largely because the plan had the support of the various civic associations. It was the feeling of the railway that the modified plan was theoretically less well adapted to the needs of the situation than was the short-looping plan, but in its desire to co-operate with the mercantile interests, the company was willing to accept the modified plan.

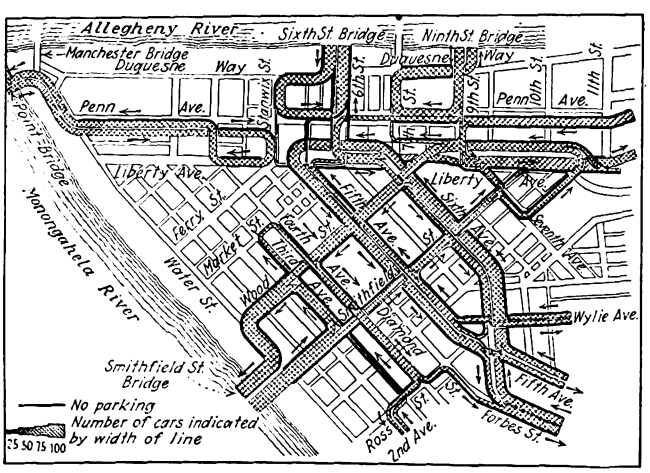
Under the new traffic regulations streets in the Golden Triangle are divided into three classifications. On Fifth and Oliver Avenues and on Sixth Street, all extremely heavily traveled thoroughfares, no parking is permitted at any time. On practically all other streets where the railway operates in the downtown district parking is forbidden between 8 a.m. and 6 p.m. Elsewhere one-hour parking is allowed. The relation between the no-parking streets and the car routes is shown on an accompanying map.

On certain one-way streets parking is permitted on the right-hand side. This, however, is not a handicap to the railway. As all such streets are rather narrow it is impossible for vehicles to pass standing street cars on the right, and no steady flow of traffic could be maintained on that side of the street. Parking, therefore, creates no interference with the flow of vehicles, which continues uninterrupted on the left-hand side of the street.

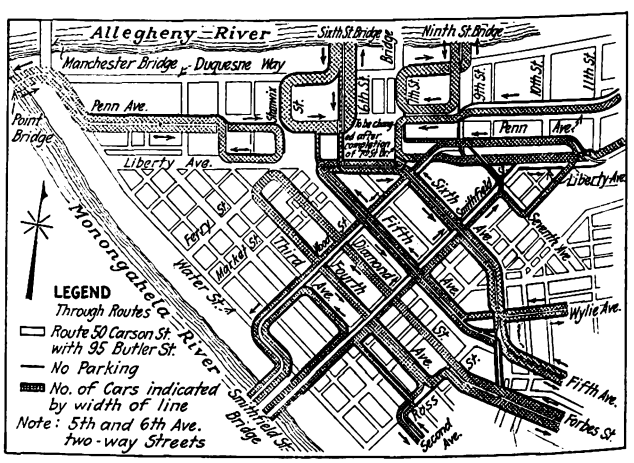
On all such streets where parking is permitted on one side only a space designated as a loading zone has been set aside on the parking side and plainly marked. These zones vary in length from 40 ft. to 100 ft., but in no case cover more than one-half of the entire length of the block. In this zone vehicles may stop only to pick up or discharge passengers or to load or unload merchandise. The latter operation is not allowed to consume more than twenty minutes.

From the railway point of view there is practically no difference between the elimination of parking between 8 a.m. and 6 p.m. and its total elimination, because serious congestion exists only during business hours. Since the passage of this ordinance the car running time through the congested districts has been reduced about 25 per cent. Moreover, it has been possible to keep cars much closer to schedule. Whereas it used to be the practice to turn back 50 or 60 cars every day in order to fill breaks in headway it is now necessary to turn back only two or three for this purpose.

Violation of the provisions of the new ordinance is punishable by a fine of $3 for the first offense, $4 for the second offense within a period of six months, $5 for the third offense and a fine ranging from $10 to $25 for the fourth offense within six months. Previously the fines were $1, $3, $5 and $10. Simultaneously with the passage of the new regulations the City Council authorized the addition of 125 patrolmen to the existing police force. A large part of these are used in traffic regulations.



Parking Is Now Forbidden Along Nearly All Present Trolley Routes in the Golden Triangle



Completion of the New Diamond Street Loop Will Eliminate Many Turning Movements

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Enforcement of the new ordinance has been strict, but there has been little complaint. The merchants who were instrumental in securing the adoption of the plan have given it their hearty support. The great majority of the people, being street car riders, are thoroughly in sympathy with it. Numerous commendatory letters have been received by the railway, telling how much more quickly it is possible to travel by trolley.

Retail trade in the Triangle has been slightly smaller in volume during the past few weeks than it was during the same period a year ago. Analysis of the situation has shown, however, that the decrease is not due to the no-parking regulations. Outside the area where these are operative, the falling off has been even more noticeable.

On March 23 the City Council approved a franchise for the construction of new track on Diamond Street. Work was commenced on this project on May 19. Its completion will permit certain changes in routing, as shown on an accompanying map, and reduce the number of crossing and turning movements in the congested district. When this has been accomplished the second important step will have been taken to relieve the situation in the downtown section, and it is expected that these arrangements will suffice for some years to come, or until some rapid transit system has been built to serve the city.

Passengers Helped to Find Their Way

MORE than 50,000 street car riders visited the St. Louis Zoological Gardens in Forest Park on Sunday, April 26. Once there they found that some thoughtful person had worked out a system of directing signs that carried visitors depending on street cars for transportation to the nearest car lines over the shortest and most direct route. Black and white signs, in keeping with the dignity of the gardens, were placed at convenient places indicating the routes to be taken to the cars. The name of the United Railways was not on the signs. The larger signs, placed at the bear pits, the monkey house and the pond of the sea lions, read:

"Follow the trail of arrows to the street cars."

Smaller signs with directing arrows read:

"To the street cars."

At the boulevard just to the south of the monkey cage many car patrons have wandered away from the direct route to the loading platform of the railway. There a neat sign read:

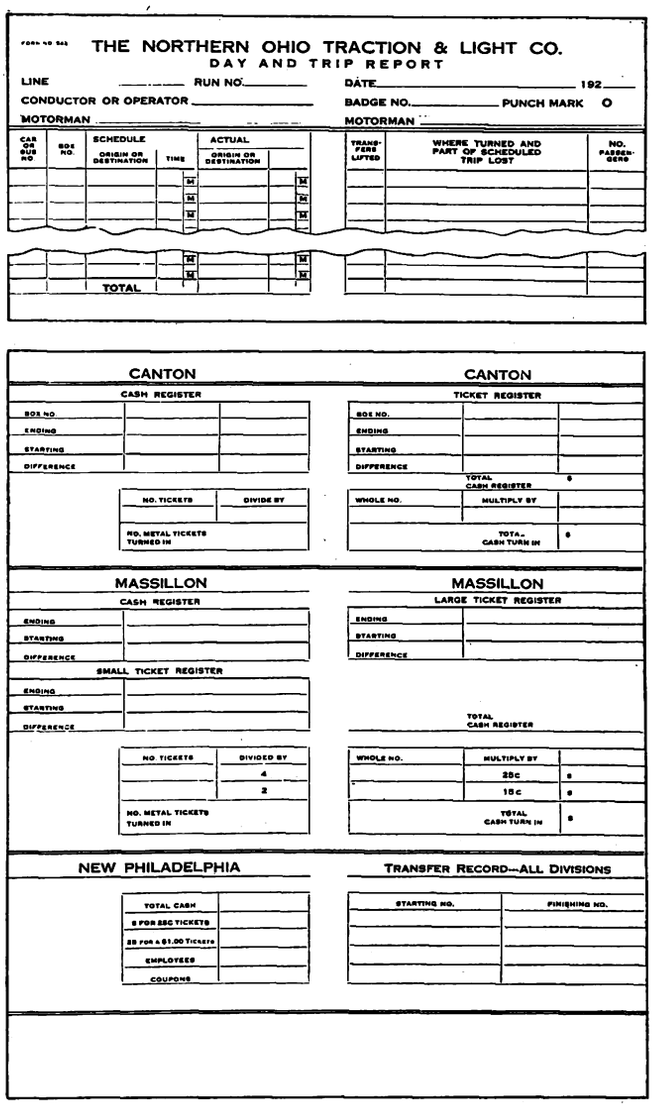
"Straight ahead across the boulevard to the street cars."

This sign is reinforced by a number of small arrow signs converging on the path directly across the boulevard to the cars.

The zoological gardens are the most popular part of Forest Park, but were considered out of the way for street car users. Officials of the railway recognized this condition and they established a loading loop immediately south of the gardens on the Market Street car line. A cinder path was built to the gardens with the consent of the Park Department officials. Apparently the public did not learn of this path, for park traffic department officers of the railway found that comparatively few patrons utilized the loading and unloading station. Thousands came out of the park far to the east and west of the station, and some were forced to walk back a quarter of a mile to get to the cars. Investigation revealed three old tin signs directing park visitors to the cars, but none of them was so placed that it directed the public to the path to be taken to the loading platform.

Uniform Trip Sheet for Cars and Buses

AFTER making a trial for some time of separate forms of trip sheets for cars and buses, the Northern Ohio Traction & Light Company, Akron, Ohio, recently adopted a day and trip report that is applicable to all cars and buses operated on the system. This form, a reproduction of which is shown herewith, is 8½ in. wide and 9¾ in. long, arranged to fold into the standard form of cover used by operators.



This Trip Sheet Is Used for Both Cars and Buses of the Northern Ohio Traction & Light Company

On the front spaces are provided for recording line, run number, date, name and badge number of conductor or operator and motorman. Spaces are provided to record by trip the vehicle and fare box number and the schedule and actual leaving time from each terminal. Corresponding to each trip the records of transfers collected and passengers carried are given.

On the reverse side space is provided for cash register, ticket register and transfer record for the cities of Canton, Massillon and New Philadelphia. It is believed that the use of this standard form of trip sheet will simplify the auditing by making all the records uniform.

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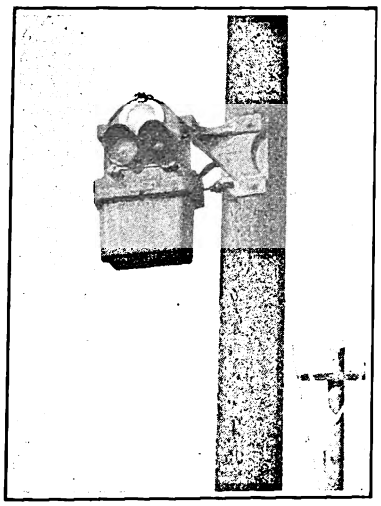
Permissive Signals at Junctions

Distant Repeater and Counting Features Facilitate Car Operation on Single-Track Line—Details of the System Are Given

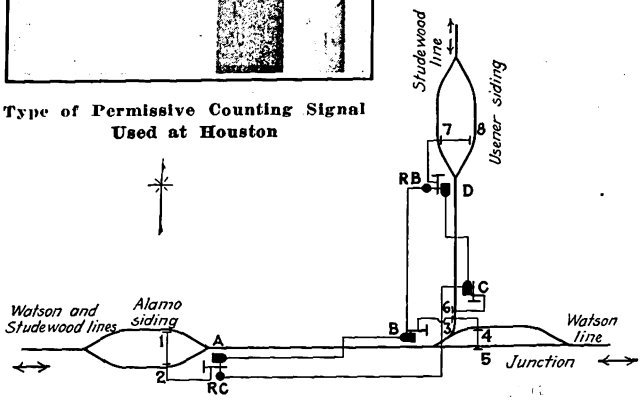
AUTOMATIC signals of the car-counting or permissive type, made by the Nachod Signal Company, are used by the Houston Electric Company, Houston, Tex., to protect cars operating through a junction of single-track lines. These signals are part of an extensive system covering the single-track lines in the city and suburbs. The installation was begun in 1920.

A block of signals *A-B* extends from Alamo siding to Junction, with its contactors 1 and 2 connected to signal *A* on Alamo siding. Contactors 3, 4 and 5 are connected to signal *B*, the latter two being on Junction siding. All contactors are of the non-moving part type and are directional. Signals *C* and *D* are on a piece of single track between Junction and Usener with contactor 6 connected to signal *C* and contactors 7 and 8 connected to signal *D*.



Type of Permissive Counting Signal Used at Houston

There is a distant repeater, *RC*, of signal *C* located on the same pole with signal *A*, which shows yellow when signal *C* is red. In addition there is a repeater, *RB*, of signal *B* located on the same pole with signal *D*, which shows red when signal *B* is red.



Layout of Signals at Junction Point Showing Method of Repeating Indications

Studewood cars operate between Usener and Alamo sidings both ways and the Watson cars operate between Alamo siding and Junction both ways. An eastbound Watson car will pass under contactor 2 provided signal *A* does not show red, regardless of whether *RC* shows yellow or dark. This will set signals *B* and *RB* at red (stop) and signal *A* at permissive. Should *RC* have been showing yellow at this time, it would indicate that there is a Studewood car proceeding toward Junction, having at contactor 7 set signal *D* at permissive and signal *C* at stop. The first-mentioned car in passing under contactor 5 would clear signals *A*, *B* and *RB* to the normal dark or neutral. The Studewood car, passing under contactor 6, would clear signals *C* and *D*, and at contactor 3 immediately set signals *B* at permissive and *A* at stop. Later these signals would be cleared at contactor 1.

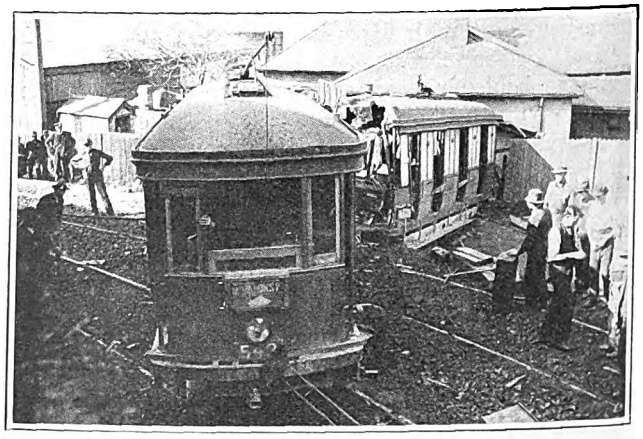
When an eastbound car, which might be either a Watson or Studewood car, is in the block moving eastward with signal *RC* dark, then a southbound car will be stopped at Usener by signal *RB* at red until the first-mentioned car has passed out of the block either at contactor 5, or continued through the second block *CD* and out at contactor 8. If *RC* is yellow an eastbound Studewood car will stop, but the Watson car may enter the block under this indication. A Studewood car southbound will always be stopped by signal *RB* at red. All signals have counting relays, so that following movements may be made through either of the blocks.

Runaway Train in Sydney

A CURIOUS accident to a two-car train occurred some time ago on the North Sydney division of the New South Wales Government Tramways. Much of the traffic on this division in the morning and evening rush hours is to and from the ferry to Sydney. There are 124 cars on this division and many grades, some of them more than 10 per cent. Train operation is common, each car of a two-car train being single truck and equipped with motors and with a controller at the outer end of each train. One motorman and two conductors are used.

In the case of the wrecked train, a defect developed in the controller on the front platform. In such cases the rules permit the motorman to operate the train from the controller on the rear platform, taking the necessary equipment with him. One conductor is then placed on the front platform to warn the motorman in the rear of any impending danger.

No difficulty was experienced in the operation of this train until a short distance of the terminus, where there is a sharp down grade. The motorman then discovered that he had left his air-brake handle with the conductor on the front platform, apparently relying on the conductor to control the movement of the train. As the conductor was not qualified to do this, the cars attained high speed and jumped the track when rounding a curve shortly before the terminus was reached. Several persons were injured and two were killed. The accompanying illustration shows the wrecked train being pulled back to the track. The accident was the most disastrous which has ever occurred on the Sydney tramway system.



Train Which Jumped Track in North Sydney, N. S. W.

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Traffic Increasing on the Beaver Valley Bus Lines

Service Rendered by Railway Subsidiary Reaches New Territory and Has Replaced Car Service on One Line—Revenue from Private Hire Business Amounts to 10 per Cent of Total—Operation of Additional Bus Lines Is Planned

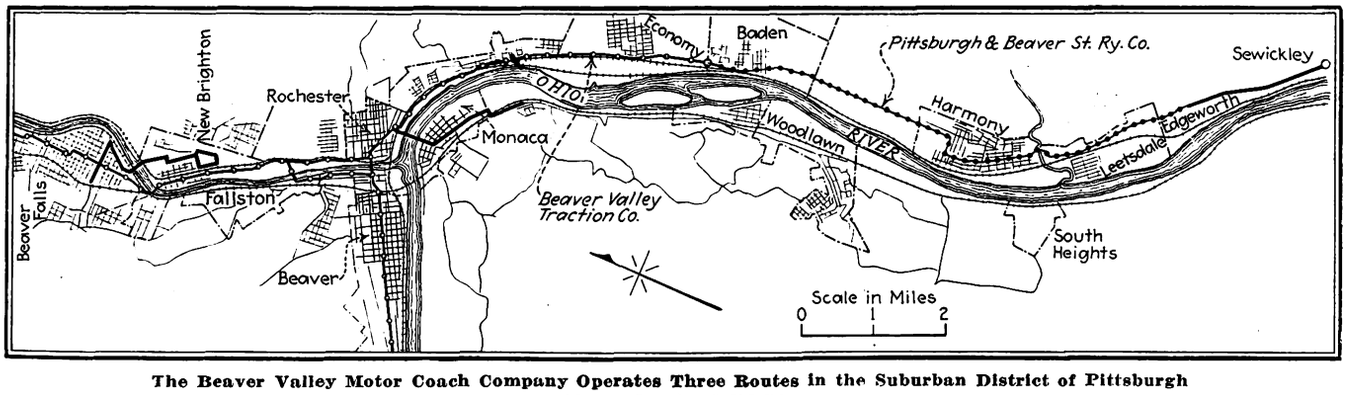
BUS operation was undertaken for the first time by the Beaver Valley Traction Company in July of last year. Under the name of the Beaver Valley Motor Coach Company, buses are now operated as feeders to the railway lines that serve the Beaver Valley and also on one route formerly served by trolley cars. All told, the company operates six buses of the street-car type on three routes. The accompanying table indicates these routes, their length, the rates of fare, the headway and the number of buses needed to fill the schedules, which average 8 m.p.h.

Earnings per bus-mile show a general increase in traffic during the ten months of operation. A temporary increase occurred in April, when railway operation in Ambridge was suspended for two weeks, as told in ELECTRIC RAILWAY JOURNAL for May 23, 1925, page 826, and buses were used to carry all the local traffic in that town. At present, due to business depression in this area, the earnings are running somewhat below the level attained in the early part of the year.

The motor coach company was incorporated in February, 1924, and in the period from July 15 to Sept. 15, 1924, installed bus service upon three routes, each under different circumstances and in separate sections of the territory served by the traction company.

Operation was first commenced on a 2-mile route from Leetsdale to Sewickley. This district was formerly without local transportation service of any kind. At Leetsdale is the southern terminus of the Pittsburgh & Beaver Street Railway where the cars of the Beaver Valley Traction Company operated by agreement. Sewickley is the northern terminus of the Pittsburgh Railways.

The Lincoln Highway connects these towns and also the Borough of Edgeworth, which lies between, as shown on the accompanying map. Between Sewickley and Pittsburgh there is considerable commuting via the Pennsylvania Railroad. By continuing the bus route through the town to the railroad station a large number of commuters are accommodated.



The Beaver Valley Motor Coach Company Operates Three Routes in the Suburban District of Pittsburgh as Shown by the Solid Lines

A flat fare of 10 cents is charged on this route, which was started July 16, 1924. The headway is 30 minutes during the day and 20 minutes in the rush hours. Service is withdrawn after 8 o'clock in the evening.

The monthly record of bus-mile earnings is shown in the accompanying table. Revenue increased from 20 to 36 cents per bus-mile since operation started and now is large enough to meet the cost of rendering the service.

On the route from Beaver Falls to New Brighton buses replaced a single-track street car line 2.7 miles long. This trolley line had failed to earn its operating expenses for many years past with a nickel fare and a twenty-minute headway. Request had been made of

MONTHLY RECORD OF BUS-MILE EARNINGS, IN CENTS

	Route 1	Route 2	Route 3
July (fifteen days), 1924	20	..	..
August	22	..	..
September	22	29	14
October	26	31	15
November	29	31	19
December	31	35	23
January, 1925	34	37	28
February	36	37	32
March	35	37	31
April	33	32	29

DETAILS OF BUS ROUTES OPERATED BY BEAVER VALLEY MOTOR COACH COMPANY

Route	Date Opened	Length in Miles	Fares—One-Way Cash	Fares—Ticket	Headway—Minutes Normal	Headway—Minutes Rush	No. of Buses Normal	No. of Buses Rush
1. Leetsdale to Sewickley	July 16, 1924	2.0	10	none	30	20	1	2
2. Beaver Falls to New Brighton	Sept. 1, 1924	2.7	10	7@50c.	20	15	2	3
3. Rochester to Colona	Sept. 15, 1924	2.2	10	none	30	30	1	1

Buses owned: One 25-passenger White-Bender, two 25-passenger Mack-Bender, three 24-passenger Pierce-Arrow-Thompson.

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the railway company to repair its pavement, and this would have necessitated tie removal, which, in turn, would have demanded providing a new and substantial substructure. The cost of doing this work would have reached $125,000, whereas the investment in necessary bus equipment was but $21,000.

Since inaugurating bus service, Sept. 1, 1924, the development of traffic has been such as to necessitate a fifteen-minute service for a two-hour period during the evening rush hour. In this case the cash fare is set at 10 cents with seven tickets for 50 cents. Tickets are used by 60 per cent of all passengers carried.

The third bus line of the Beaver Valley Motor Coach Company is operated from Rochester to Colona. Between these towns an independent bus line operated on a 5-cent fare was already in existence. Upon application to the Public Service Commission a certificate of convenience and necessity was granted to the company, however, and service was started on Sept. 15. The fare on this line has always been 10 cents, but owing to the depression in the steel business, the revenue of the bus line was small for a period of several months. More recently it has increased to a point where it about equals the operating expenses.

The Beaver Valley Motor Coach Company now has an application before the Public Service Commission of Pennsylvania for an additional route from Rochester to Woodlawn, a distance of 7 miles. This line would serve communities which at present lack adequate local transportation. Recently the commission granted an application to this company to operate a bus line from Beaver Falls to Beaver by way of Fallston. Although the Beaver Valley Traction Company now operates a railway line from Beaver Falls to Beaver, this bus route would serve in part new territory and would afford a more rapid means of transportation between the terminal towns. Fare for the through trip is to be 25 cents, whereas the fare on the street car line is 15 cents. The higher fare is warranted because of the more direct and rapid means of communication.

A substantial part of the total revenue of the company has been obtained from the operation of private hire or chartered buses. This has amounted to as much as 10 per cent of the gross receipts from bus operation. It is hoped to increase the earnings from this source by extensive advertising and publicity work.

As one step in the encouragement of party bus service a circular has been mailed to every organization in the Beaver Valley district. The next mailing will probably cover all of the customers of the associated light companies. It is expected that the chief business will be into Pittsburgh. The rate for this trip of 30 miles for a party of 20 to 22 passengers in a 24-passenger bus will work out about 3.5 to 4 cents per passenger-mile. This compares with 3.6 cents per mile on the steam railroad for one-way rates, but the actual comparative rate on the railroad is 1.9, obtainable by ten-trip tickets good for three months and for any number of persons in the party; thus five persons could use one ten-trip ticket on an excursion journey. On the other hand, of course, the bus party is taken from door to door so that the bus rate is justified through the higher class of service.

Soon after the Sewickley-Leetsdale service was started, the company sent postcards, with return card attached, to residents of the community to be served, using the mailing list of the electric light company. On these cards the following questions were asked:

1. Do you make frequent trips that would permit you to use this service?
2. Do you travel by train to Pittsburgh frequently?
3. Is our coach connection between the two street railways of advantage to you?
4. What do you recommend to improve our service to you?

Replies received indicated that the service was greatly appreciated by residents of the district. These cards were followed up from time to time with other requests for comments or statements from the company, all with the idea of maintaining prestige for the service and to keep the company's name in the public mind.

Costs of Operation

Depreciation is charged at 5 cents per bus-mile. Under this arrangement the investment will be amortized in about five years. There is also a general repair reserve fund for which 3 cents per bus-mile is charged. Unusual repairs necessitating the expenditure of more than $200 are charged against this fund instead of being allocated to the operating account. By this means the monthly expenses are more or less stabilized, and costs for one month do not vary greatly from those of another.

Expenditures for fuel, labor, and materials used in maintenance average about 5 cents per bus-mile. White, Mack, and Pierce-Arrow buses are used. Fuel and maintenance costs vary only slightly between the different types of bus.

Items listed above come to about 13 cents per bus-mile. A somewhat greater expenditure is required for drivers' wages, insurance, interest, general overhead, etc.

The satisfactory revenue showing of the regular routes operated by the Beaver Valley Motor Coach Company is attributed by C. D. Smith, general manager, to the combination of an adequate fare and the application of modern principles of merchandising transportation service. By co-operating with the Beaver Valley Traction Company the bus company has been able to protect the railway from independent competitive bus operation.

Good Employee Safety Record on Beaver Valley Lines

NOT a single fatal accident to an employee has occurred on the lines of the Beaver Valley Traction Company, New Brighton, Pa., during the past four years. Neither has there been a permanently disabling accident, and only four occurred which caused more than ten days disability. During 1924 there was a total of only 24 such accidents, a decrease of 47 per cent from the preceding year. The decrease in accidents causing disability of less than ten days was 185 per cent from that of 1923, and the number of working hours lost was 233 per cent less. On the basis of this record, the company was the winner of the Rice safety award for the best record in accident prevention. In competition with the railway were the industrial plants and railways of twelve counties in western Pennsylvania. The award was originated by the late Cecil G. Rice at the time he was president of the western Pennsylania division of the National Safety Council, and was presented to the company that shows the greatest reduction in employee accidents for the year 1924 as compared with the average for 1921, 1922 and 1923.

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Camshaft Control on Locomotives Built at St. Catharines

Layout of Apparatus Is Arranged for Easy Inspection and Repair—Two Units Were Built by Railway to Care for Growing Freight Business

INCREASE in traffic on the Niagara, St. Catharines & Toronto Railway, a part of the Canadian National Railways system, reecntly caused the company to build two new freight locomotives. After the amalgamation of the Canadian National and the Grand Trunk Railways it was decided that the Niagara, St. Catharines & Toronto Electric Line should handle all freight on the Merritton-Port Dalhousie division of the Grand Trunk. This added so largely to the volume of such business being handled that it was decided to augment the motive power.

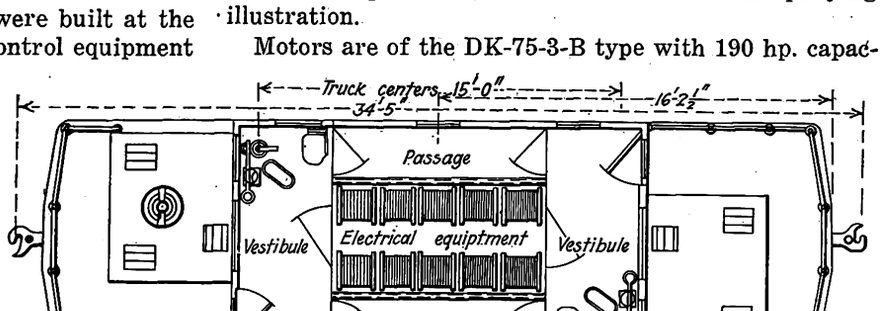
Accordingly two 50-ton locomotives were built at the shops in St. Catharines. Motors and control equipment were furnished by the English Electric Company of Canada, Ltd. It is said that this is the first English Electric camshaft control equipment used in America. The electric equipment is assembled in two groups, each of which consists of two motors and control. These groups are placed in parallel or in series position by means of a remote-control switch. With the change-over switch in either position the two motors of either group may be connected in series or parallel with each other, through the operation of the camshaft governed by the master controller. Control apparatus is actuated by current taken from the line.

Each pair of motors is provided with a DK S-500 Form B circuit breaker of the hand-setting type. This type is preferred in order to insure a brief examination of the control compartment by the motorman after the circuit breaker has opened and before it is closed.

The controller consists of a number of steel cams which are mounted on a mica-insulated steel shaft driven by an electric motor through flexible worm gearing. The cams are set at different angles and each one in its turn closes a contactor. Only two of these contactors are fitted with arc chutes. Line breakers interrupt the normal working current and thereby save wear and tear on the remaining contactor tips, which break only a small equalizing current. The master controller is fitted with the usual notch-regulating device and has nine series and six parallel notches.

An important feature in connection with these locomotives is the rapidity with which the various parts can be inspected and removed for repairs. All the apparatus is directly under the eye of any one entering the control compartment, as shown in an accompanying illustration.

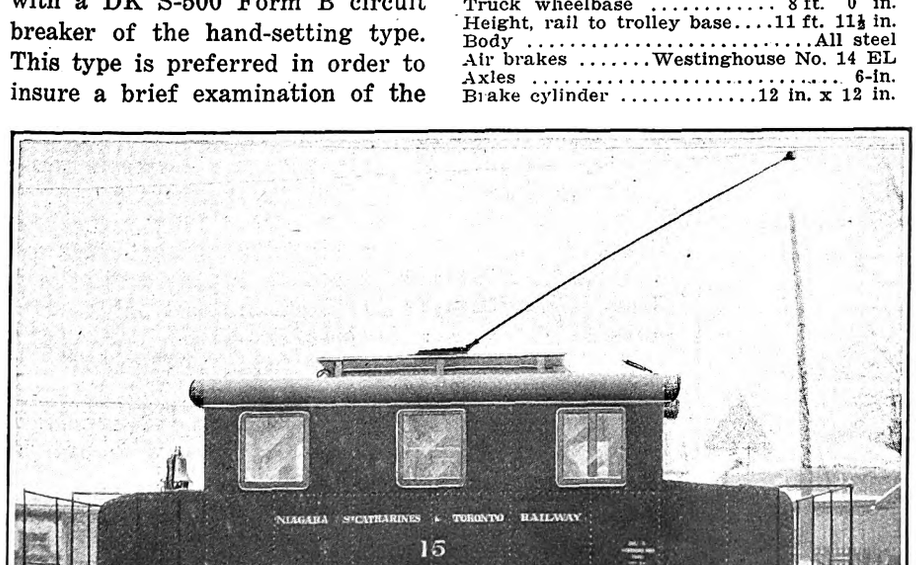
Motors are of the DK-75-3-B type with 190 hp. capac-

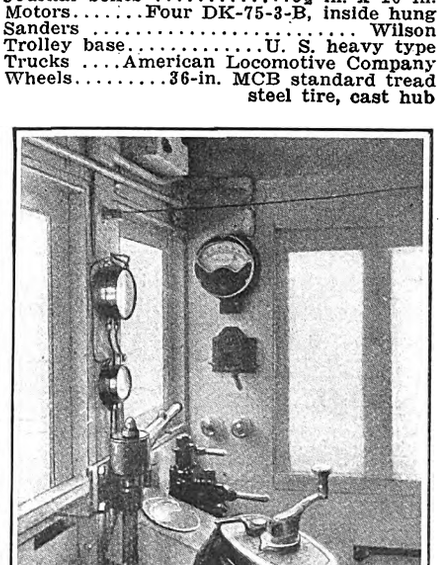


Layout of Apparatus in the New Freight Locomotive of the Niagara, St. Catharines & Toronto Railways

SPECIFICATIONS OF 50-TON FREIGHT LOCOMOTIVE OF NIAGARA, ST. CATHARINES & ONTARIO RAILWAY

Weight:	
Body	39,804 lb.
Trucks	24,400 lb.
Electric equipment	31,900 lb.
Air equipment	4,620 lb.
Total	100,760 lb.
Bolster centers, length	15 ft. 0 in.
Length over all	34 ft. 5 in.
Truck wheelbase	8 ft. 0 in.
Height, rail to trolley base	11 ft. 11½ in.
Body	All steel
Air brakes	Westinghouse No. 14 EL
Axles	6-in.
Brake cylinder	12 in. x 12 in.
Compressor	General Electric CP-30, 37 cu.ft. capacity
Control	DK, M7, camshaft type
Couplers	Sharon 5-in. shank
Hand brakes	Peacock and Dayton ratchet mast
Heater equipment	Consolidated
Headlights	C-H. luminous arc
Journal boxes	5½ in. x 10 in.
Motors	Four DK-75-3-B, inside hung
Sanders	Wilson
Trolley base	U. S. heavy type
Trucks	American Locomotive Company
Wheels	36-in. MCB standard tread steel tire, cast hub





The Body of the New St. Catharines Locomotive, Shown at Left, Is Divided into Three Sections with a Cab at Each End and an Equipment Compartment in the Middle. At Right, Master Controller Which Operates the Camshaft Control in the Compartment

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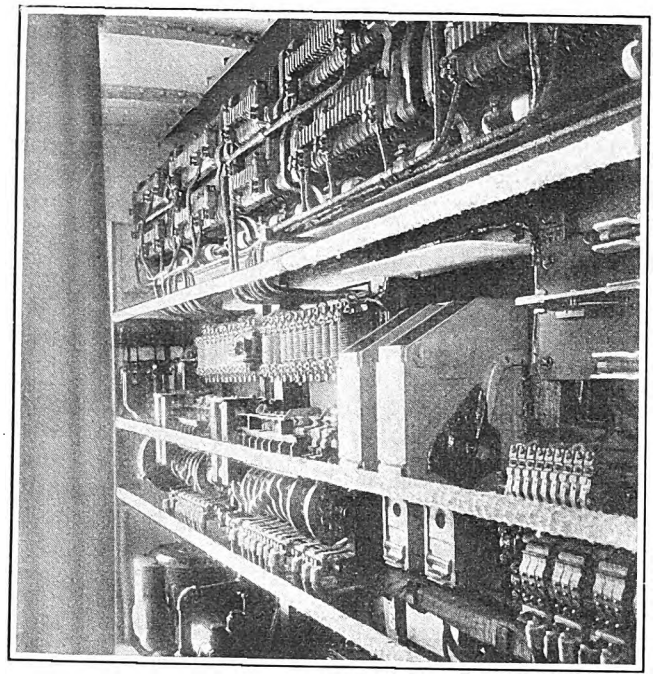


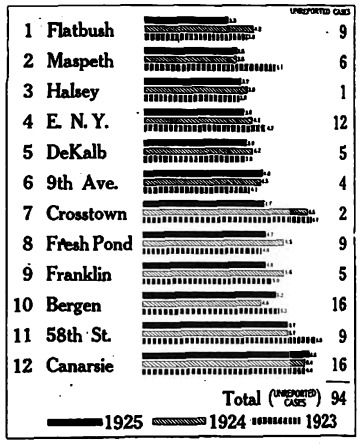
Electrical Equipment Is so Arranged that It Can Be Inspected Easily and Removed for Repairs

ity at 270 amp. and 600 volts. The locomotive will start a train weighing 710 tons and reach a speed of 16 m.p.h. in one minute on level tangent track. Helical gears with a ratio of 81/15 are used. The wheels are of 36-in. diameter. Weights and specifications of various other equipment used on these locomotives are given in the accompanying table.

Arousing Interest in Safety Reduces Accidents

Charts Bring Home to Trainmen in Brooklyn a Realization of Serious Condition Existing During the Winter

LAST January, when Brooklyn was buried in snow and ice and the already congested street traffic was further crowded by the encroachment of piles of snow along the sides of the highways, accidents on the various surface lines operated there reached a peak. The combined accidents of all classes on all divisions of the surface lines of the Brooklyn-Manhattan Transit Corporation and the Brooklyn City Railroad reached a record total of 2,898 for the month. This number led the officials of these companies to undertake a vigorous safety campaign to cope with this situation. The results have been fully up to the expectations and desires of the officials, as indicated by a drop to 1,958 accidents in the month of March, which showed a material reduction, being lower than the corresponding number for the same month in either one of the two preceding years.



A Wall Chart in Colors Is Used to Show Comparative Accident Records on the Brooklyn Surface Lines

The procedure followed in this campaign was very simple and direct. It was dictated by the necessity of securing immediate results. Led by Clinton E. Morgan, vice-president and general manager of the Brooklyn City Railroad, in his capacity as operating manager of the joint operations of surface lines of the two companies, meetings were held in all the depots. The men who operate the cars were addressed. Charts were used which showed graphically and with startling simplicity the serious condition confronting the companies. Assisting Mr. Morgan were F. W. Lawrence, safety supervisor; William Siebert, superintendent of surface lines of the B.-M. T., and A. L. Hodges, assistant secretary and treasurer of the Brooklyn City Railroad. First, they showed the men of each operating depot the way in which accidents had increased in number and seriousness on the whole road. Then they went into details of the various classes of accidents and numbers of each on the various lines. Thus actual conditions on the lines where they operated were brought home to the men. Instructions were given in ways and means of avoiding some of these accidents.

Meetings are held each month at which the figures for the preceding month are discussed. Prior to the meetings, however, graphic charts printed in colors were posted in all depots showing the comparative statistics of accidents by divisions for the current year and the preceding two years. One of these charts is reproduced in the accompanying illustration. The heavy black lines, indicating the March, 1925, record of accidents per 10,000 miles, show that in the majority of the divisions there was a decrease.

It is said that the posting of these charts has aroused a healthy interest among the car crews, and the spirit of competition between divisions has been stimulated. Naturally this has resulted in a desire to secure the leadership in minimum number of accidents.

The competitive idea in securing accident reduction is also carried out in the mechanical departments, where each shop is pitted against all the others in a race to show the greatest number of months per year with a 100 per cent safety record. This 100 per cent record is defined as "no time lost by any employee during the month on account of accidents at work." Two shops have attained perfect records for nine consecutive months, as shown in the "box score" which has been adopted for posting in the shops.

Mechanical Department Safety Box Score

Shop	1924 June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1925 Jan.	Feb.	Total
Canarsie	x	x	x	x	x	x	x	x	x	9
Flatbush	x	x	x	x	x	x	x	x	x	9
Crosstown	x	x	x	–	x	x	x	x	x	8
Montrose Avenue	–	x	x	x	x	x	x	x	x	8
Ridgewood	x	x	x	–	x	x	x	x	x	8
58th Street	–	x	x	x	x	x	x	x	x	8
De Kalb Avenue	–	x	x	x	–	x	x	x	x	7
Maspeth	x	x	x	x	–	x	–	x	x	7
23d Street	x	–	x	–	x	x	x	x	x	7
Bergen Street	–	x	x	x	x	x	x	–	–	6
Electrical Repair	x	–	–	x	–	x	x	x	x	6
Queens Plaza	x	–	–	–	x	x	x	x	x	6
East New York Surface	–	–	–	–	x	x	x	x	–	4
36th Street Repair	–	x	–	x	–	x	x	–	–	4
Ninth Avenue	–	–	–	–	x	–	x	–	x	3
East New York Repair	–	–	–	–	–	–	x	x	–	2
East New York Inspection	–	–	–	–	x	–	–	–	x	2
Fresh Pond	x	–	–	–	–	–	–	–	–	1
39th Street	–	–	–	x	–	–	–	–	–	1
52d Street	–	–	–	–	–	x	–	–	–	1

The "Box Score" Shows the Shops that Had No Time Lost by Any Employee on Account of Accidents in Each Month

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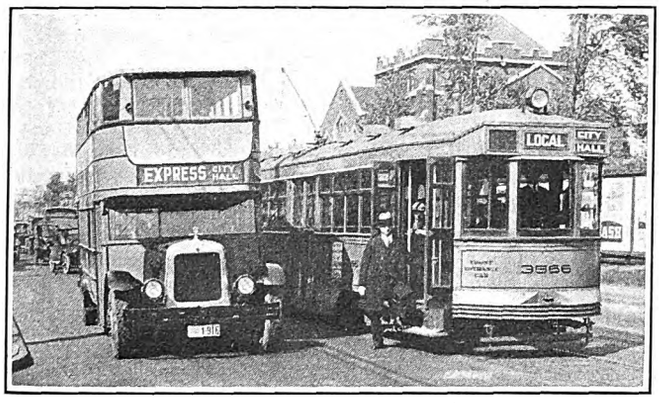
Experiments with "Four-Track" Bus and Car Service

IN ITS studies on co-ordinated rail and bus service in Detroit, the Department of Street Railways of that city recently conducted a test on Gratiot Avenue. The purpose of this test was to determine the saving in time possible to passengers if a co-ordinated express and local service was given by bus and car on Gratiot Avenue. To secure immunity from traffic delays, the test was made early Sunday morning, April 26, between 1:30 a.m. and 3:30 a.m., between Seven-Mile Road and Cadillac Square. This is a one-way distance of 7.8 miles. A double-deck coach (totally inclosed type) and a Peter Witt car were used.

The run inbound from Seven-Mile Road was made with both vehicles in local service, i.e., making all schedule and compulsory stops. The schedule stops, of which there were 62, were fifteen seconds each, and five "compulsory" stops were made in only sufficient time for the car or bus to be brought to a stop and restarted.



Bus and Car Used in Test of Co-ordinated Service, Detroit

The total number of local and compulsory stops was 67, or 8.59 per mile. The elapsed time for each vehicle on this run was practically the same, being 47 minutes 40 seconds for the coach and 47 minutes 50 seconds for the car.

The run outbound from Cadillac Square was made with both vehicles in express service, i.e., they made 25 scheduled stops and three "compulsory" stops, the durations being the same as during the local run and the total number of stops averaged 3.58 per mile. The elapsed time for this express run was 28 minutes seven seconds for the coach and 29 minutes for the car. This test showed that under the conditions under which it was run, a saving of about nineteen minutes could be made by either vehicle when the number of stops were reduced in the proportion named. Views of the bus and car used are shown above.

Whether this differential of nineteen minutes could be maintained throughout the day is considered debatable by the department. It might easily be done if automobile parking was prohibited, if all or most of the other vehicular traffic was directed to other streets, and if the fullest use was made of the traffic signals at all important intersections, but it is felt that such restrictions might bring forth some protest from other users of the street. On the other hand, it is a fact that some economical traffic congestion alleviation means must be devised sooner or later.

While the illustration shows the bus marked as express and the car marked as local, the department does not consider that the test was sufficient to determine which type of vehicle would make the better express unit in this service. This phase of the question will receive further consideration.

Operations of Twelve Large Properties Compared

FOLLOWING the practice of several years past, statistics of six of the largest surface lines and an equal number of rapid transit companies for their latest year are published herewith. In our issue of this paper for May 2, 1924, an analysis of operations on 93 city properties was presented. While these 93 properties represented a total of $354,000,000 in gross earnings, the selected twelve companies in the larger cities took in $336,000,000. They operated about one-ninth of the track mileage in the United States. While six of the companies are classed as rapid transit, only three of them operate elevated or subway lines exclusively, the other three having combinations with surface lines. Each of the twelve companies earned above $8,000,000 last year, and the average receipts exceeded $28,000,000.

The six surface companies showed practically no change from 1923 in gross earnings, and the same is true of operating expenses, including taxes and depreciation. In the rapid transit group the gain in receipts and in expenses was about 2.5 per cent. The operating ratio, including taxes and depreciation charges, averaged 83.74 per cent for the surface properties, compared with 2.87 in the previous year, and ranged from 80.17 to 89 per cent. For the rapid transit lines, the average operating ratio was 71.83, compared with 72.4 in the previous twelve months, and ranging from 56.4 to 80.5. Selecting the three roads which operate subway or elevated lines exclusively, the average was 66.23, as against 68 the year before.

Greater service was rendered by each car in the surface lines group, as indicated by the annual miles operated per car. This figure averages 35,083, compared with 34,752 in the preceding year. Rapid transit lines, on the other hand, showed a decrease, namely, 42,355 miles per car, as against 42,475. Total passengers per mile of single track operated varied from 948,394 to 2,244,152 on the surface lines and from 1,423,671 to 1,546,435 on the rapid transit lines. For the former group there was a decrease of 6.8 per cent and for the latter an increase of 3.1 per cent. It should be understood, however, that several companies, especially rapid transit lines, do not keep account of transfer or free passengers. For that reason an exact comparison is not possible. Revenue passengers on surface lines decreased 1.7 per cent, while car mileage was increased 1.6 per cent. On the rapid transit lines there was a gain of 2.2 per cent in passengers and 3.6 per cent in car mileage.

STATISTICS PER CAR-MILE AND PER CAR-HOUR ON TWELVE LARGE ELECTRIC RAILWAYS

	Six Surface Roads						Six Rapid Transit Roads					
	1919	1920	1921	1922	1923	1924	1919	1920	1921	1922	1923	1924
Transportation revenue per car-mile, cents	38.9	44.7	47.8	47.8	48.3	47.6	33.1	38.0	38.0	40.8	39.4	39.6
Expenses and taxes per car-mile, cents	32.5	37.6	43.2	43.2	43.4	41.9	25.9	30.6	33.4	31.1	32.3	30.5
Transportation revenue per car-hour, dollars	$3.26	$4.00	$4.03	$3.14	$4.11	$4.03	$4.21	$4.63	$5.21	$5.14	$4.85	$4.80
Expenses and taxes per car-hour, dollars	$2.75	$3.37	$3.62	$3.64	$3.59	$3.50	$3.25	$3.70	$4.13	$3.81	$3.84	$3.66
Operating ratio, per cent	83.06	87.45	85.08	83.34	82.87	83.74	74.00	77.26	77.92	71.63	72.40	71.83

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Association News & Discussions

California Superintendents Discuss Operation

REPRESENTATIVES of the operating departments of California electric railways, organized as a superintendents committee of the California Electric Railway Association, held their semi-annual meeting in Sacramento, May 8 and 9. Publicity and advertising men, who constitute the public relations committee of the state association, met with the superintendents and participated in the program.

In a talk on "Employment and Training," A. W. Brohman, superintendent Market Street Railway of San Francisco, said that the intelligence test, somewhat similar to that used in the United States Army during the world war, had been discontinued because it proved to be merely a test of mental agility and not of ability and resourcefulness. All instruction on the road is given by a single instructor. This occupies seven to ten days, in which the new man studies all lines of his division. The plan of having one man in charge of a new man through his breaking-in period has been found highly beneficial, Mr. Brohman said.

Weekly meetings of the line instructors, follow-up men, dispatchers and division superintendents are held for general discussion of common problems. Mr. Brohman concluded his talk with the following quotation from the annual report to the stockholders:

"Notwithstanding the great increase in automobile traffic there has been no material increase in the number of accidents or expenditures for claims. Accidents involving fatalities were fewer than ever before in the history of the company or its predecessor. This we believe is due entirely to the training system for carmen which was inaugurated a few years ago and has continued to develop satisfactorily, and will unquestionably continue to reduce both labor turnover and the number of accidents and heavy expense incident thereto."

Discussion on traffic congestion was directed by George B. Anderson, manager of transportation Los Angeles Railway. He reviewed some of the material that he had presented to the American Electric Railway Association as chairman of the committee on traffic congestion and pointed out that automobile owners and drivers are highly organized to advance their own interests, while the majority users of transportation, the street car riders, are left without representation except by the electric railways. It becomes their moral obligation therefore to act in behalf of this majority by initiating measures of traffic relief. The subjects that these measures must deal with were enumerated as automobile parking, one-way streets, protection for principal street car arteries similar to that given to principal automobile boulevards, segregation of traffic, prohibiting jaywalking, prohibition of parades where they interfere with essential traffic, left-hand turns, street car safety zones, protection of boarding and alighting passengers and examination of applicants for automobile drivers' licenses.

Bus operation was discussed by F. Van Vranken, manager Los Angeles Motorbus Company. Tire mileage was a leading topic of general discussion following his paper. In this connection it was stated that all the double-deck buses operated by the Los Angeles Motorbus Company and the Los Angeles Railway are equipped with pneumatic tires.

Ben S. Allen, manager public relations department, Key System Transit Company, spoke for the public relations committee on methods of co-operation between the operating men and the men directing public relations. He emphasized that the giving of adequate service by courteous trainmen is essential to good will because passengers who have to hold onto a crowded car by their eyebrows are not likely to feel friendly toward the transportation agency.

A review of recent state legislation affecting the electric railway was made by W. V. Hill, manager of the association. He said that the session closed without any bills inimical to the state railway interests being passed, although several were proposed.

A banquet was held at the Hotel Senator on May 8 and the following day the delegates were guests of the Sacramento Northern Railway on a trip over its interurban to Chico. The next joint session of the superintendents committee and public relations committee will be held in Los Angeles in November.

Commerce Chamber Elects Officers

CONCLUDING sessions of the United States Chamber of Commerce were held in Washington on May 22. The subjects considered were general in their nature. The principal business of the afternoon session was the election of officers and directors for the ensuing year. The officers elected were: President, John W. O'Leary, Chicago; regional vice-presidents, Louis E. Pierson, New York; William Butterworth, Moline, Ill.; Robert R. Ellis, Memphis, and Paul Shoup, San Francisco; honorary vice-presidents, Owen D. Young, New York; Henry M. Robinson, Los Angeles, and R. W. Boyden, Boston; treasurer, John Joy Edson, Washington.

Among the seventeen directors elected the following are best known to electric railway men: Philip H. Gadsden, Philadelphia, Pa., for the Second District; A. J. Brosseau, New York City, for the Manufactures Department; Paul Shoup, San Francisco, Cal., for the Foreign Commerce Department, and A. L. Humphrey, Pittsburgh, Pa., for the Transportation and Communication Department.

HOUSING AND CIVIC DEVELOPMENT

Problems of civic development as related to city planning, building construction and home ownership, the first dealing especially with such systematic layout as will bring proper functioning of utilities, were considered in papers presented before the Civic Development group and in discussion of the papers which followed.

The speakers were Dr. John M. Gries, chief of the Building and Housing Division, Department of Commerce, "The Building Congress—Its Purposes and How It Is Achieving Them in Five Cities"; Thomas Adams, general director of plans and surveys, Regional Plan of New York and Its Environs, New York City, "Economic Use of Land in Urban Communities"; and Morris Knowles, civil engineer and city planner, Pittsburgh, "Housing in Relation to Citizenship." Numerous delegates participated in the discussions. John S. Lonsdale, of St. Louis, presided.

Dr. Gries told of the experiences in

COMING MEETINGS OF *Electric Railway and Allied Associations*

***June 2-4*—Central Electric Railway Association, French Lick Springs, Ind.**

***June 3*—Central Electric Railway Master Mechanics' Association, special meeting, French Lick, Indiana.**

***June 3-5*—Iowa Electric Railway Association, Waterloo, Iowa.**

***June 10-12*—Canadian Electric Railway Association, Montreal, Quebec.**

***June 26-27*—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.**

***July 22-25*—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.**

***Oct. 5-9*—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.**

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New York, Boston, Philadelphia, New Jersey and Oregon in the organization of all interests concerned with the construction industry into building congresses to co-operate in problems common to all, jurisdictional disputes among labor and differences among builders, supply men, etc. The congress must be purely local to succeed, he said. Settlement of differences by arbitration he mentioned as one of the important aims. Governmental agencies should not undertake work of this character unless private industry defaults, Dr. Gries said. He urged building interests to confer in each community regarding the construction program in order to avoid peaks and valleys and thus stabilize conditions.

"Efficiency is born of order and beauty," asserted Mr. Adams, who declared that city planning means more than to devise means of moving streams of automobiles through the streets.

Mr. Adams emphasized the necessity of sound zoning laws to control development of urban property. He cited specific instances of excessive taxation due to lack of a plan in developing a city's growth. Transportation, sewage, electric and other utility systems often are unnecessarily wasteful because of haphazard development, he said. He advanced the suggestion that it would be more profitable to use some suburban properties for agricultural purposes until conditions justified improvement than to permit them to lie idle until this time arrived. Land must increase 10 to 15 per cent in value annually in order to justify investment in its development, he said. He told of experiences of some cities which laid costly public service lines without ability to put them to use.

Mr. Knowles urged home ownership to bring improved citizenship. The great question is proper financing, he said. Operative-builders offer the best hope to stop the decline in home ownership, he said, pointing out evils in government assistance and in industrial homebuilding.

Insurance a Topic

At the Insurance Group meeting, casualty insurance and accident prevention were discussed by George W. Wells, Jr., insurance commissioner for Minnesota, and fire insurance and fire prevention by Stacey W. Wade, insurance commissioner for North Carolina. H. A. Smith, president National Fire Insurance Company, described the insurance service of the chamber for 1924-1925.

According to Mr. Wells, the policyholder should be vitally interested in getting the maximum service from the reservoirs of insurance funds and that the supply in them is conserved so there is no unnecessary drain to pay for losses that could have been prevented. Among things the policyholder should do are: (1) Read the contract and know just what it contains; (2) place insurance only with carriers authorized to do business in this country; (3) safeguard legislation interests; (4) reduce waste.

Forty-two states, said the speaker, now require practically that employees injured as the result of industrial accidents be indemnified according to a definite schedule regardless of the question of negligence of the employer. This is now taken as an accepted condition of doing business. Legislators alone are not responsible for this trend. They are influenced by the opinion of constituents. Insurance companies have no voice in forming these laws. Policyholders themselves are at fault because legislators do not know what they are thinking. While the individual cannot do much, co-operation through chambers of commerce or trade associations should allow groups of policyholders to speak with authority.

American Association News

Exhibit Space Application Forms Go Out Monday

By F. C. J. Dell
Director of Exhibits American Electric Railway Association

APPLICATIONS for exhibit space for the October convention will be mailed from association headquarters on June 1. June 30 is the last day to file space requests in order to have them considered by the committee when it meets to make the initial space assignment early in July.

The hotel managements are making arrangements to take care of the largest crowd of convention delegates ever assembled in October. Many companies postpone this until after the vacation season. This procrastination often results in disappointments.

Railway companies and car manufacturers will have an excellent opportunity this year to show city or interurban cars. The Atlantic City authorities have provided a specially built track down Arkansas Avenue which will extend from the trolley tracks on Atlantic Avenue to the foot of the Boardwalk. A temporary curve will connect this track with the trolley tracks. Cars will come in over the Pennsylvania Railroad carded to the Chelsea yard and will be run down to Arkansas Avenue and over to the foot of the street opposite the Pier. The association has received a special rate from the drayage contractors, which will materially reduce the cost to exhibitors. The association has never, until this year, had proper space to show cars at Atlantic City. The platform which was usually provided at considerable expense only accommodated four or five cars and the exhibitors were put to great expense to get the cars over to and placed upon this platform.

Railway companies will again be given an opportunity to exhibit on the Pier. Last year some half dozen railways used space for various purposes. Among them were the Chicago Rapid Transit Company, the Chicago North Shore & Milwaukee Railroad, the Public Service Railway and the United Railways & Electric Company of Baltimore. These exhibitors used their booths to show what they were doing in the way of bus operation, general advertising, safety work, maintenance and engineering work, record keeping, etc., and to give their delegates headquarters on the Pier.

Space applications have been sent to all railways and it is expected the response to the opportunity presented will be quite general, especially from the larger companies.

The executive committee has set aside a special day for the inspection of exhibits. Wednesday, Oct. 7, will be devoted entirely for this purpose. No meetings of any kind will be held and the delegates will be free to devote the time to looking over the various displays.

At a recent meeting of the executive committee the following resolution was passed:

"Whereas certain manufacturers of automotive equipment have in past years brought buses to our Atlantic City convention and parked such vehicles at advantageous points in the vicinity of prominent hotels and extended invitations to railway delegates to accompany their representatives on demonstrations trips; and

"Whereas such practices tend to defeat the purposes of the exhibition by reason of such railway delegates absenting themselves at various times from the exhibition proper and thus perhaps neglecting the study of exhibits of other manufacturers; and

"Whereas the action of this committee last year in withholding its approval of such practice proved to be so satisfactory for all exhibitors at the convention; therefore, be it

"Resolved, That this executive committee in meeting assembled this 14th day of April, 1925, hereby again votes to look with displeasure upon any manufacturers having exhibits at any place other than that designated by the association."

This action by the committee is for the benefit of the convention as a whole, as the most important thing about any convention is to keep the delegates together all during the meeting. No one manufacturer should be given the opportunity of having any advantage over any other manufacturer. Besides, it places some restraint upon those manufacturers who are not connected with the association as members, but who do take advantage of the convention and come to Atlantic City with the idea of demonstrating their products in hotel rooms or upon the streets. Therefore, the executive committee's action is nothing more or less than a protection to all association members and exhibitors.

If you have not already done so get your space applications into headquarters without delay. If for any reason you have not received applications it is suggested you communicate promptly with association headquarters.

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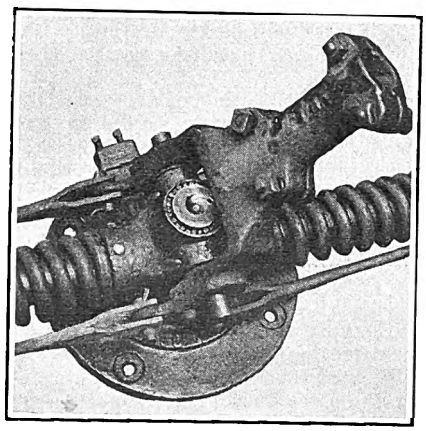
Maintenance of Equipment

Roller Bearings for Worn Trolley Bases

SPINDLES and inside bearings have become worn, so that repairs are necessary on a number of U. S. No. 1 trolley bases used by the New York State Railways, Utica lines. These are reconstructed in the Utica Park shop of the company in the following manner. The spindle is



Reconstructed Trolley Base on Which Cold-Rolled Steel Rollers Are Used in Center Bearing

turned down slightly and a small cut taken off inside the bearing. This leaves a space so that cold-rolled steel rollers can be installed.

With the first reconstruction, ⅛ in. diameter rollers are used. The size is increased to 7/64 in. and to ¼ in. as further wear takes place. This type of construction is made just as cheaply as boring out and rebushing could be done, and at the same time the advantages of a roller bearing are obtained.

Keeping Down Number of Joint Failures

ON THE Eastern Massachusetts Street Railway system an extensive welding program carried on during the past four years has raised the mileage of welded track to 58.3 per cent of the total. This company has 331.9 miles of paved track, of which 149.7 miles, or 45.1 per cent, is welded, and 305.2 miles of unpaved track, of which 221.5 miles, or 72.5 per cent, is welded.

Altogether there are 99,629 welded joints on the system. During the past four years there have been 1,360 failures, or 1.365 per cent of the total. In 1924 only 386 failures occurred, or 0.388 per cent. Plate failures have been more numerous than any other kind, with rail failures second. Detailed figures concerning failures are given in accompanying tables.

RAIL JOINT FAILURES ON EASTERN MASSACHUSETTS STREET RAILWAY

	1921	1922	1923	1924
Joints welded	34,771	37,415	17,841	9,602
Plate failures	151	114	258	292
Rail failures	126	69	125	85
Weld failures	96	24	11	9
Total failures	373	207	394	386

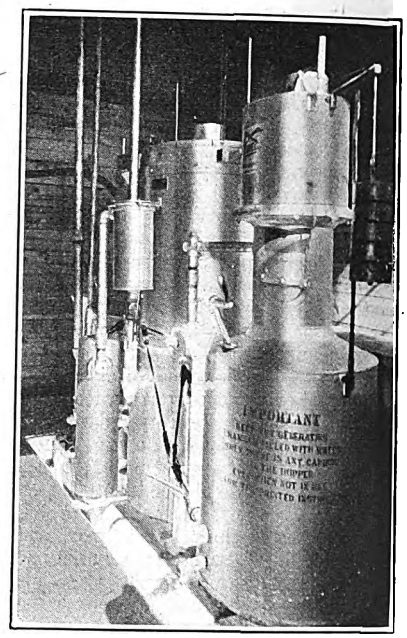
CLASSIFICATION OF RAIL JOINT FAILURES FOR 1924 BY TYPE OF RAIL

	Old Plates	New Plates	Rail	Welds
7-in. and 9-in. grooved girder rail	12	..	28	..
70-lb. and 75-lb. T-rail	117	3	32	3
60-lb., 58-lb. and 56-lb. T-rail	145	5	22	6
50-lb. and 48-lb. T-rail	10	..	3	..
Total	284	8	85	9

Welding has been done by the metallic arc process, particular attention being paid to the training of the men, as explained by Frank B. Walker in a paper recently presented before the American Welding Society, an abstract of which was published in ELECTRIC RAILWAY JOURNAL, May 2, page 698. Careful training and inspection are believed by the management to be the reasons for the low proportion of failures.

Acetylene Generators Prove Economical

LOW-PRESSURE oxweld acetylene generators of the twin type have been installed by the New York State Railways in its overhauling shops at Utica, Syracuse and Rochester. The accompanying illustration shows the installation in the Utica Park shops. The outfits have a capacity of 100-lb. nut carbide 1¼ in. x ⅜ in. and produce 100 cu.ft. of acetylene per hour. An advantage of the twin type of generator is that an uninterrupted flow of gas can be maintained, as one generator can be charged while the other is generating. The equipment is installed in a concrete foundation with drains in the floor so that refuse runs into the sewer. So that the refuse will settle before it goes to the sewer a sump is provided outside the building. This is cleaned out at frequent intervals. The company reports a saving of approximately two-thirds over the cost of buying gas.



Acetylene Generator Installation at Utica Park Shops

Preventing Converter Brushes from Being Raised

ROTARY converters in substations of the Interborough Rapid Transit Company, New York, N. Y., which are started from the alternating-current side are provided with brush-lifting devices to avoid excessive sparking at the commutator while starting. Movement of the brushes up and down is controlled from a lever with handle. The intention of this device is to provide for lifting of brushes while the machine is at rest, and while no current is passing from the brushes to the commutator. When at times they were lifted while the machines were loaded disastrous results followed and in some cases the machines were badly damaged. To prevent such occurrences, a special interlocking device has been applied to these rotary converters to prevent improper use of the brush-lifting device.

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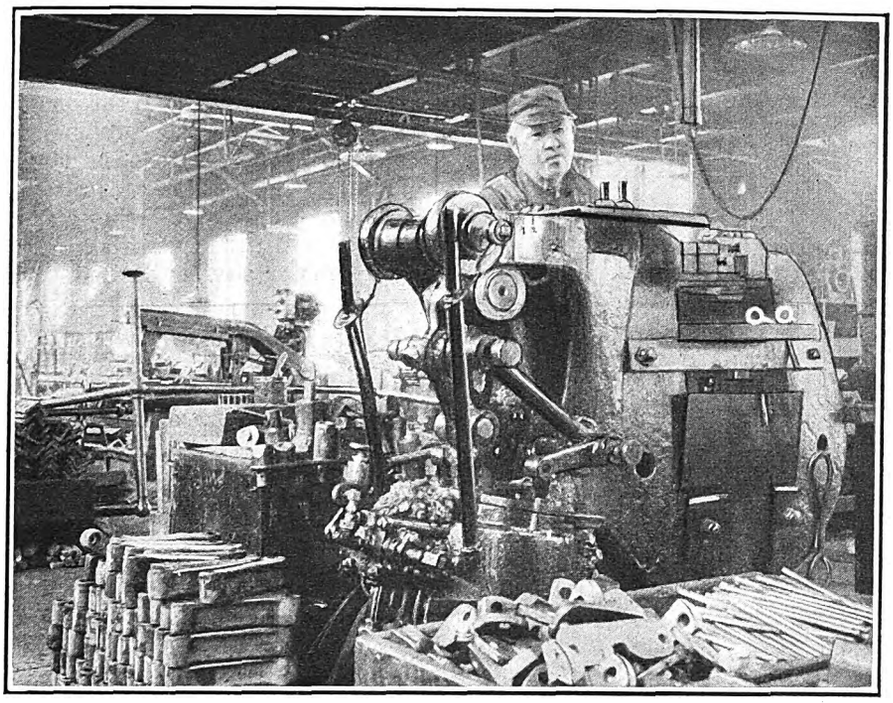


Gear Case Clamps Are Made on This Rivet Machine at a Rate of More Than 100 per Hour

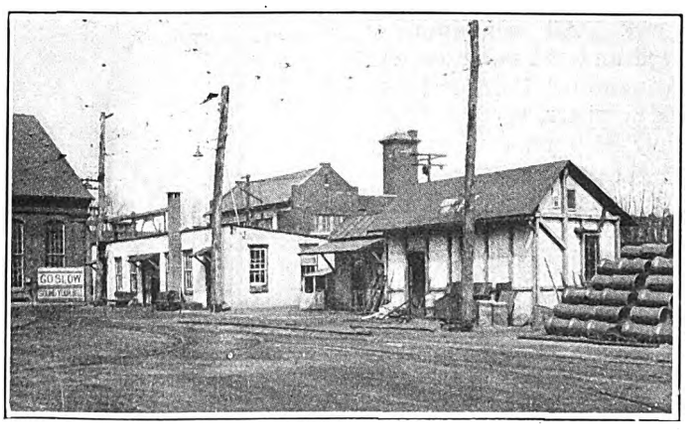
The safety equipment consists of two control switches operated by push buttons, the push buttons in turn being closed or opened by the handle of the brush-lifting device. With the operating lever in the down position, that is, with the brushes raised from the commutator, one control switch is opened by the lever pressing against a push button. This opens the circuit to the closing coil of the positive switch and so prevents the operator from picking up "load" while the brushes are off the commutator. With the brush-lifting lever in the up position, that is, with the brushes in contact with the commutator, the other control switch closes the circuit so that the operator is able to open or close his main switch and to drop or pick up load as he may desire. A small movement of the brush-lifting lever away from its up position closes the circuit to the push button and trips the main positive switch so as to cut the rotary converter off the direct-current bus. This occurs before the brushes can be raised from the commutator and the machine is thereby saved from flashing over.

Making Gear Case Clamps on a Rivet Machine

MUCH time has been saved in the Homewood shops of the Pittsburgh Railways by the practice of making gear case clamps on a rivet machine instead of doing this work by hand. The machine used is a Hanna riveter, made by the William K. Stamets Company, equipped with a special die for the purpose. Five movements of the machine are made. The first bends a steel rod to U-shape. The eye at the end is made in two more movements, and as there are two eyes this makes a total of five. About 30 seconds is required for the entire process. Previously gear case clamps were made by the blacksmith at a rate of ten per hour.

Work Car Crews Have Comfortable Quarters

HEAVY material used by the United Railways & Electric Company of Baltimore on track maintenance and reconstruction jobs is transported by work cars from the Columbia Avenue storage yard to the location where it is needed. Crews to operate these cars are under the direction of the superintendent of work cars, who has his office at the storage yard. Because the transportation of such material cannot always be arranged so systematically as is the operation of passenger cars, work crews often have a certain amount of spare time on their hands. Comfortable quarters and recreational facilities have been provided for these men in the building shown at the left in the accompanying illustration. This serves also as an office for the superintendent of work cars. As all cars must pass the building when leaving the yard he is able to keep a careful check on their operation.



Building at Left Provides Recreational Facilities for Crews of Service Cars in Baltimore

New Equipment Available

Portable Oil Burning Furnace

A KEROSENE oil furnace mounted on wheels has recently been placed on the market by the Chausse Oil Burner Company, Elkhart, Ind. This furnace is intended particularly for use in electric railway shops for melting lead, babbitt, cyanide for case hardening, or boiling water, heating pipe and conduit to be bent, and expanding collars, gears, etc., which are to be shrunk on axles.

The machine is a combination of a Chausse oil burning torch with a retort. The forge weighs about 160 lb. empty and it has a width of 20 in., length of 36 in., and height of 33 in. The heating chamber is 14 in. x 14 in. x 16 in. high and is lined with firebrick with a flame entrance from the bottom. The kerosene tank holds 12 gal., which is sufficient for twelve

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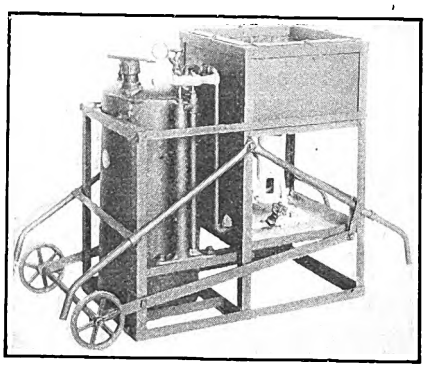
hours operation at maximum temperature. The burners consume 1 gal. per hour and will deliver sufficient heat to melt 200 lb. of lead in from 20 to 30 minutes from a cold



Portable Oil Furnace for Shop Use

start. The maximum temperature generated by the burner is 1,800 deg., and any reduction in the amount of heat generated will, of course, decrease the fuel consumption. Pressure on the tank is maintained between 10 and 20 lb. by a Chausse hand pump. The wheel mounting of this machine is a convenient feature. When stationary, the forge sets horizontally on a firm base. By lifting on the handles at the end opposite the wheels, the wheels are lowered and the machine can be moved about without tilting. When tipped down again, the wheels rise so that the base forms a firm support.

Lock for Fare Boxes

SECURITY against being picked or vibrated into release is provided in a four-way lock now being placed on the market by the Cleveland Fare Box Company, Cleveland, Ohio, particularly for locking its fare boxes. A number of electric railways have already adopted this as their standard for fare-box equipment. The four-way lock is opened by a four-sided key, each side of which is specially grooved to fit a particular lock. All sale numbers are registered and the patentee will register the name of the purchaser and the lock numbers, so that duplicate keys may be purchased only by the owner.

The lock body is machined from a solid block of bronze, all other parts being of brass, with the exception of the shackle and shackle stop pin. The shackle is open-hearth, cold-rolled steel, case hardened for theft and rust protection. The shackle stop pin is of music wire, spring steel copper plated. The lock has a grooved slot in the shackle which locks in the grooved slot of the bolt in such a manner that it is impossible to vibrate it out of a locked position. The lock can be oiled to increase its life and also prevent freezing when exposed to moisture in cold climates.

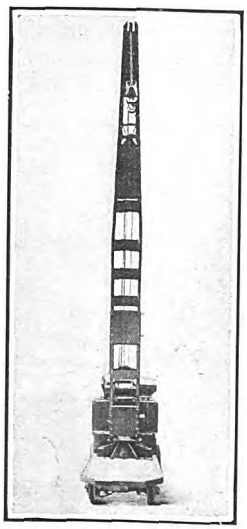
The size of the lock is 2 in. x $1\frac{7}{16}$ in. The shackle is of $\frac{3}{8}$-in. steel, and the clearance between the top of the case and the under side of the shackle is $1\frac{1}{2}$ in.

Telescoping Boom for Truck Cranes

USERS have found that long crane booms are sometimes a hindrance rather than a help, while short ones do not provide for a sufficient boom range. To meet these conditions an improved form of telescopic boom has been designed by the Ellwell Parker Company, Cleveland, Ohio, for its type C.K. portable electric cranes, with four settings between 12 and 17 ft. The boom is of all-steel construction and is raised or lowered by special cables operated from an electric motor-driven hoist unit with two grooved drums. The second drum carries separate $\frac{3}{8}$ in. plow steel non-twist cables to a two-part line-hook block sheave on the boom tip.

The heavy side panels of the boom are latticed and gusseted with a continuous $\frac{1}{4}$-in. steel plate extending from the hoist cable sheave to the boom elevating sheave. The lower box or enveloping section of the boom is of plate steel, providing a strong support for the telescopic portion.

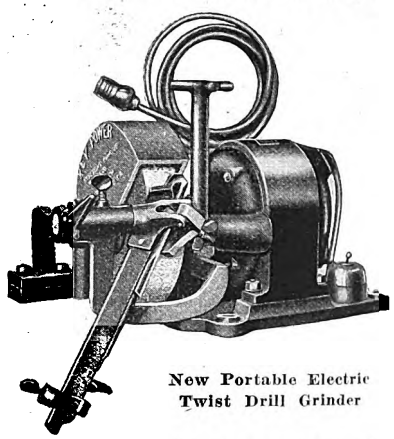
The distance from the top of the boom to the hook is but 23 in. This has been accomplished by suitably locating the trip switch. This design has advantages when handling loads in low head room, or for reaching over a gondola car, or motor truck. The steel crane column is supported on ball and roller bearings. This column, set in a heavy pedestal, is firmly anchored to the main frame. The boom is furnished with either a hand or motor slew as desired.



Portable Electric Crane with Telescoping Boom

Portable Electric Twist Drill Grinder

EFFICIENT work at a rapid rate by unskilled workmen is a feature of a portable electric twist drill grinder called the "Keypower," which is being manufactured by the



New Portable Electric Twist Drill Grinder

Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.

The grinding action is produced by light pressure of the drill against the face of the grinding wheel. This light pressure method of grinding permits rapid work, and prevents burning of the steel or drawing the temper of the tool. The tool or drill is held firmly in place by means of a wedge-shaped tool holder that assures uniform results and eliminates the uncertainty of hand application. No water is necessary during the grinding process, since there is a continuous air circulation on the face of the wheel that cools the tool.

A Westinghouse $\frac{1}{4}$-hp. motor provides the motive power. An attachment cord enables the machine to be plugged into any ordinary socket. It is capable of redressing all shapes and kinds of edge tools and is fitted for grinding $\frac{1}{4}$ in. to $1\frac{1}{2}$ in. drills.

This device has been found particularly useful by construction gangs and in railway repair shops and yards, due to its portability, the machine weighing only 60 lb. With it tools can be ground right on the job. A heavy hood over the grinding wheel gives ample protection to the operator.

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The News of the Industry

Relief Sought for Continuation of Tri-City Operation

Relief measures which the Tri-City Railway of Illinois expects to ask of the Illinois Commerce Commission have been disclosed to the municipal government in a conference between members of the City Council and railway officials. These measures are:

1. Further extension of service by buses instead of track construction and electric line extension.
2. Increase of approximately 40 per cent in fares through the abandonment of the identification card and 5-cents-a-ride plan and the substitution of the 10-cent fare with three rides for 25 cents.
3. Arbitration of employees' wages on the basis of the company's ability to pay rather than the demands of the unions.
4. Abandonment of certain lines on streets where repaving is contemplated by the city, including Fourth Avenue west of Fifteenth Street.

The traction lines were represented by President R. B. MacDonald and T. C. Roderick, general manager. If relief is not secured the company states that it will not be able to continue to operate the railway in Rock Island and Moline. Figures presented by the company showed a deficit in 1924 of $12,323. Gross earnings were $755,622, operating expenses and taxes $767,946. Last year the number of revenue passengers carried on the Illinois lines was 10,574,361, whereas in 1923 it was 11,761,675. In 1920 the number of passengers carried was 16,842,215.

The report of the traction company also indicates that in the last five years the company failed by $1,358,977 to earn the amount allowed it by the State Commerce Commission, that body's findings allowing a return on investment of $315,000 annually.

Trainmen are at present receiving a wage of 58½ cents an hour. Their wage contract expires on June 1, 1925, and their working agreement contract expires June 1, 1926.

Decline in Traffic in Baltimore Explained

Elimination of certain fare zones in Baltimore, Md., and the increased use of the automobile are held to be largely responsible for a decrease in traffic in Baltimore, according to a statement issued by the United Railways & Electric Company. The company feels that the increase in fare put into effect last June has been a negligible factor in the decline. In support of this claim statistics are cited from other cities in which there have been no recent increases. They disclose that the decline has been greater than in Baltimore.

In making comparisons the company cites that in January, February and March of this year the total number of revenue passengers was 55,599,351, compared with 58,770,572 for the corresponding period of 1924. It is stated by the company that this difference of approximately 3,000,000 is an apparent difference so far as individual car riders are concerned. It is a difference largely due to the fact, it is claimed, that since June, 1924, many Baltimore passengers have paid one fare less than they did before that time because of fare zone extensions made at the time the 7½-cent fare became effective. In other words, there are now many lines on which patrons formerly counted as three revenue passengers, but on which they count now as only two, and there are others that have been reduced from two to one. The company says that a fairly accurate estimate of the loss in revenue passengers due to these changes in zones and fares is 2,075,083, making the comparable figures 58,770,572 for 1924 and 57,674,434 for the first three months of this year, a difference of 1,096,138, or 1.86 per cent, compared with a loss of 4.04 per cent for the eight cities chosen for purposes of comparison.

Ruling Hits Taxis

West Virginia Decision Enjoins Taxi Men from Soliciting Business Along Railway Route Between Princeton and Bluefield— Argues State Must Protect Public Servants— Over-rules Former Decision

WHAT is said to be the first decision of its kind not only in West Virginia, but in the United States as well, is that in which the Supreme Court of West Virginia has awarded an injunction to the Princeton Power Company against C. K. Calloway and two other taxi drivers enjoining them from soliciting passengers along the electric railway lines of the company between Princeton and Bluefield, W. Va. The Circuit Court of Mercer County had handed down a finding in favor of the taxi drivers, but the Supreme Court over-rules the lower court.

The Supreme Court in its finding held that the policy of the state as evidenced by the road law and by the statutes relating to the Public Service Commission was not to invite or encourage ruinous competition between public carriers, but on the contrary was intended to protect such public servants in the enjoyment of their rights so that the public might be served more efficiently and economically. With the burdens and duties thus imposed upon a carrier and public control thereof established by law, the Supreme Court believed that the state was under the moral, if not the legal, obligation to give reasonable protection consistent with the public weal to the rights and franchises of such public service corporation. As evidence of the protection which the state intended giving public carriers with permits under the state road law, the act of 1923 amending the state law of 1921 provided that no such permit should be issued until it had been established to the satisfaction of the commissioners that the privilege is necessary or convenient to the public, and that this service is not being adequately performed by any other person.

The court ruled that if the plaintiff instead of operating an electric railway was engaged in operating a bus line over this highway between these terminals under a certificate of convenience, there would seem to be no doubt about its right to protect by injunction its business against unlawful interference; that the plaintiff in this case held a license to operate its electric railway between certain cities, and at great expense had constructed its line and procured the necessary equipment of cars and devoted its capital and property to the public use. It had thus placed itself under the power and control of the Public Service Commission and of the courts to require of it proper and adequate service for the public.

The court reviewed the charges of the company and answers of the respondents. The Princeton Power Company sought injunctive relief on the ground that such operation meant irreparable injury to it and was illegal because no certificates of convenience for such operation had been authorized by the State Road Commission. The plaintiff alleged that the defendants were not entitled to operate automobiles for carrying passengers for hire over fixed routes and between fixed terminals and in opposition to the railway business; that defendants had no certificates except as incident to their general taxicab business, but that, in violation of the rules and regulations promulgated by the State Railroad Commission, each of them had been engaged in the business of operating automobiles over the highway between the cities of Princeton and Bluefield. By this means these taxicab drivers were carrying a large number of passengers, depriving the Princeton Power Company of said business and the compensation therefor, the rate charged by the defendants being 50 cents instead of 40 cents charged by the plaintiff for the same service.

The taxi men made certain admissions, but denied that the Princeton Power Company was furnishing adequate transportation facilities for the transportation of passengers between the cities of Bluefield and Princeton, and also denied that its vehicles were

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fully adequate for said purpose. They admitted that they had no permit or certificate authorizing them to operate their cars over the regular route between the fixed terminals, and that no other person or corporation had any such certificate or permit, and as the State Road Commission had not established any regular route over and along said highway, the same was open and free to all persons having licences to operate taxicabs and other vehicles.

In conclusion the court said:

The defendants, with licenses to operate jitneys only, and who have never obtained certificates of authority to operate buses between the fixed terminals of the plaintiff, nor given bond or otherwise qualified to serve the public served by the plaintiff nevertheless declare their purpose and right to continue their unlawful practice of running their jitney cars over the public road between said terminals, regardless of the rights and obligations of the plaintiff. For this the authorities hold they may be enjoined. Our conclusion is to reverse the decree below, and to enter such decree here as we think the Circuit Court should have pronounced, enjoining the defendants and each of them, until they shall have acquired authority and have certified so to do in the manner provided by law, from operating their cars along or over the public road between the cities of Princeton and Bluefield, or any substantial part thereof, except as may be necessary to travel the same as incident to their ordinary taxi business, and from soliciting patrons or business at either of said terminals, or at any point along the said road, with intent of carrying persons or property regularly over said road or substantially the same route.

Fact-Finding in P.R.T. Fare Case

J. Rowland Bibbins has been retained by the city of Philadelphia to make a detailed study of the transit situation in connection with the fare determination now pending before the Pennsylvania Public Service Commission. He will aid the City Solicitor, Joseph P. Gaffney, in concluding promptly the city's final presentation before the commission.

Mr. Bibbins is at work with a specialized force of engineers and accountants to ascertain the basis facts of physical condition, operation, expenditures and revenue requirements as affecting the adequacy of the company's present budget appropriations and rates of fares.

The findings of facts presented from Mr. Bibbins' examination are expected to provide the basis for a reconsideration of the normal requirements of the property both for present and near future and bring the questions at issue to an early conclusion. At the last commission hearing full city-company cooperation to this desired end was offered and accepted.

While the commission has temporarily authorized the present fare, final decision rests upon the conclusion of hearings scheduled to begin this July.

Will Rehear International Railway's Rate Case

The New York State Public Service Commission has indicated it would approve an application by the International Railway, Buffalo, for a rehearing of the rate case which recently authorized the traction company to increase its fares from 7 cents to 8 cents or two tokens for 15 cents. The commission indicated that formal action on the company's application would be taken early in June.

The International now contends that after a thorough tryout of the 8-cent fare or two tokens for 15 cents, the revenue is still insufficient and a higher rate of fare should be had if the company is to restore its credit standing and pay its bond interest.

The James H. McGraw Awards for Electrical Men

To encourage individual initiative and creative thinking among electrical men, James H. McGraw, president of the McGraw-Hill Company, Inc., New York, publisher of the ELECTRIC RAILWAY JOURNAL, has established four annual awards, three to be competed for by the men of the manufacturing, jobbing and contractor-dealer branches of the electrical industry, respectively, and the fourth to be open, in addition, to men of the central-station industry.

The awards will be presented in the first three instances to that man in each field who is judged to have made the most important personal contribution to improvement or progress in the advancement of either the processes or practices or policies of manufacturing, jobbing, contracting or merchandising. A fourth award will be given to that electrical man in any of the four branches of the industry who has contributed the most valuable and useful idea for promoting co-operation between any two or more branches.

No separate award is made to men of the central-station industry exclusively, in deference to the fact that this field is already covered by the James H. McGraw prize and other annual awards, presented each year at the convention of the National Electric Light Association.

Each award will take the form of a bronze medal and a purse of $100 in gold. The Society for Electrical Development has been requested to act as sponsor for these awards and appoint a committee to prepare an appropriate medal and conduct the contest.

The first competition for these four McGraw awards will close on Sept. 1, 1925. Candidates must submit their statements not later than this date, addressed to the James H. McGraw Awards, in care of the Society for Electrical Development, 522 Fifth Avenue, New York City. Subsequent awards will be presented annually.

Any man of the electrical industry who feels in doubt as to whether a certain idea or service rendered is applicable or eligible for entry for the award is invited to communicate directly to the James H. McGraw Awards, in care of the Society for Electrical Development, 522 Fifth Avenue, New York City.

The committee of awards appointed by the Society for Electrical Development includes: W. W. Freeman, president Union Gas & Electric Company, Cincinnati, Ohio; H. B. Crouse, president Crouse-Hinds Company, Syracuse, N. Y.; W. E. Robertson, vice-president Robertson Cataract Electric Company, Buffalo, N. Y.; L. K. Comstock, president L. K. Comstock & Company, New York, N. Y.; F. M. Feiker, vice-president the Society for Electrical Development; Earle E. Whitehorne, commercial editor ELECTRICAL WORLD.

U. S. Supreme Court Decides Joint Rate and Transfer Case

The United States Supreme Court on May 25 affirmed the decision of the lower courts in granting an injunction to the Belt Line Railway Corporation, New York City, against enforcement of an order of the Public Service Commission (now the Transit Commission) establishing joint routes on the street railways of New York City and prescribing 5 cents as the maximum fare to be charged.

The case at issue involved transfers. The decision declares that receipt of only 2 cents for a passenger carried on a transfer by the complaining corporation is confiscatory.

J. H. Banton, District Attorney, the county of New York, the State of New York and the Transit Commission appealed from the decision of the lower courts. The Belt Line Railway Corporation is a minor carrier, operating the 59th Street line. It resisted an order of the Public Service Commission establishing joint routes and maximum fare in 1912. After a hearing when proceedings were started in 1920, the Transit Commission declared a 7-cent fare on joint routes proper, but the Belt Line applied for a rehearing, alleging that rate confiscatory, but before the rehearing was completed applied for the injunction.

The Supreme Court, in an opinion by Justice Butler, declares the evidence shows that passengers cannot be carried on transfer for 2 cents and that a rate of this kind is confiscatory.

Five Cents More Asked by Chicago Men

Negotiations have begun between the Chicago Surface Lines and their 18,000 employee members of the union for a new wage scale. The men demand a 5-cent increase. The company offered counter terms carrying a scale of 5 cents less than the 1924-1925 contract. The present basic wage is 75 cents and the men want 80, a restoration of the peak scale of 1922.

Besides the wage increase the men ask for an insurance plan to be paid for by the company and request that all night runs end at 6 a.m.

The company countered with an offer regarding working conditions, but the scale suggested was that of 1923, or 70 cents an hour. It was pointed out that the difference in wages and revenues since then have gone against the company more than $2,000,000 in the fiscal year ended in February, 1925.

Other terms suggested were:

Week day runs to be as near eight hours as possible; time and one half for all time over nine hours.

Night car runs shall be straight and as near eight hours as possible.

Allowances to be paid on basis of straight time only.

Percentage of straight runs to be readjusted.

Meal fall back allowance to be 20 minutes.

Negotiations are likewise going on between the elevated lines and their employees, but the outcome there will follow closely the results of the Surface Lines settlement.

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Spartanburg Favors Street Cars

By a vote of 690 to 382 the citizens of Spartanburg, S. C., recently decided against the adoption by the City Council of an ordinance to release conditionally the South Carolina Gas & Electric Company from the franchise requiring it to operate electric railway cars.

The vote at the election requires that the concern rehabilitate its railway in accordance with the terms of the franchise granted by the city to the original company about 30 years ago.

The ordinance drafted by the City Council provided that the company be relieved of the necessity of operating cars on condition that it remove its tracks and bear the expense of repairing and paving that portion of the street lying between the tracks and 18 in. on either side. In addition the railway company was to provide a bus service. The South Carolina Gas & Electric Company, recently bought by the W. S. Barstow Management Association, is at present operating one railway line, supplemented by bus service extending all over the city.

Several years ago the company, before it was taken over by Barstow, discontinued railway service in the city. Litigation was instituted by the city and carried under appeal into the United States Supreme Court. Following the purchase by the W. S. Barstow Management Association the company dropped its appeal and assured the City Council that it would restore railway service if litigation were stopped. The proposition was accepted by the city.

Some months ago the South Carolina Gas & Electric Company began operation of a single street car line which runs from Morgan Square out East Main to Pine Street and out Pine Street to East Spartanburg, thence to Clifton. The line was supplemented by bus service covering practically the rest of the city. At a meeting of the City Council several weeks ago it was decided in view of the rehabilitation program to call a special election to determine whether the utility should be allowed conditionally to run buses instead of street cars or be required to restore electric railway service on all city lines.

Department of City Transit in Pittsburgh to Supervise Utilities

The creation of a City Transit Commission in Pittsburgh, Pa., to be appointed by the Mayor subject to the approval of Council, is provided for by the recent approval by Gov. Gifford Pinchot of the bill of Representative Little, Allegheny. The measure gives the Council the right by ordinance to create the Department of City Transit and specifies the term of appointment of the five members of the commission. The department is to have the power to design, construct, manage, and supervise all transit facilities purchased, leased, located, constructed or otherwise acquired, equipped, owned, used or operated by the city. The facilities are to include both subway and ground operations and all parts of the general equipment of transportation companies. The commission is directed to carry into effect the laws of the state and the ordinances of the city pertaining to transit facilities and shall from time to time make its recommendations to the Council for the improvement and development of facilities for transportation of persons and property within the city. Engineers, draftsmen, designers and technical employees may be appointed whether or not they are residents of the city.

Drops $100 in Detroit Fare Box to Make Up Deficit

One of the routes in Detroit on which bus service has been installed as a substitute for a shuttle trolley line is on Dearborn Avenue in what is known as the Delray district. On this route an electric car ran back and forth on a single track to connect two through electric lines on adjoining avenues. This meant one or two transfers for practically every passenger, and the Delray Business Men's Association asked the Department of Street Railways to see what could be done and agreed to repay the deficit for a better service. After a traffic survey, the department decided to extend its Port Oakwood coach line so as to give through service over this section of Dearborn Avenue, and the shuttle trolley car was withdrawn.

On April 1, 1925, after about a month of bus service, the president of the Business Men's Association deposited two $50 checks in the fare box of one of the buses, in confirmation of the agreement to make up the deficit incurred by the extension of this service.

Dissension in Boston Over Arbitration Method

The time arriving for a change in wages and working conditions, if there are to be any, the carmen's union of the Boston Elevated Railway, Boston, Mass., has filed its demand for a substantial increase in wages. In the ordinary course of events these demands would go to arbitration, for the public trustees do not propose to pay the increase. The agreement provides for arbitration. Such arbitrations in the past have resulted in compromises, and increased pay.

This year the Boston Elevated has asked for a change in the method of arbitration. It suggests that the company nominate five men, from among whom the union shall select one to represent the company, and the union to nominate five men, of whom the company shall select one to represent the union, and the two men so selected shall choose the third arbitrator.

The union refuses to accept this form of arbitration and has decided to hold to the system that has been used for a dozen years. In accordance with that decision it has selected James H. Vahey to represent it again. Mr. Vahey has been its counsel and arbitrator for many years. The Elevated has selected Roland W. Boyden as its repersentative. Mr. Boyden was the United States government's unofficial observer at the Reparations Commission conferences in Europe. These two men will select the third man to sit with them if the new wage proposition has to be arbitrated in the old way.

New York Central Suggests Use of Diesel Locomotive

The New York Central Railroad, which has been ordered by the Public Service Commission of the State of New York to carry out extensive electrification projects on certain of its lines entering New York City, has presented a petition to the commission intimating that the road has a method of solving the elimination of steam locomotives in a way other than by electrification.

The railroad says that development of the internal combustion engine for use as motive power for railroad operation has now reached a stage that promises a practical solution of the problem of substitution for steam locomotives a method of propulsion which eliminates many, if not all, of the objectionable features of steam railroad operation while retaining its effectiveness at an expense of installation and maintenance below the present cost of installing and maintaining any system now known which uses electricity as the propelling energy.

It is estimated that on one division installation of the third-rail system would cost $9,000,000. Since the electrification order, the New York Central has been investigating the Diesel-electric engine now on test in the Baldwin Locomotive Works. Officials of the road have inspected the engine and it is understood have made preliminary arrangements to purchase a number of the new locomotives. They contend that the new motive power is particularly adapted to use on the Putnam Division.

The last order of the Public Service Commission of the State of New York, issued April 30, was in effect that New York Central shall by July 1, 1925, submit to the commission a statement of the details of plans of electrification of the main line Putnam Division and Saw Mill River Road branch north of the Yonkers branch. Further interest of the road in connection with the Diesel-electric locomotive is directed toward the west side improvement along Riverside Drive.

Wage Agreements in Illinois Cities

Railway employees of the Illinois Power & Light Corporation, operating in Bloomington and Normal, Ill., have accepted the wage scale of 51 cents an hour tendered by E. O. Brown, general manager, representing the company. There were three dissenting votes to the acceptance after a conference which lasted several hours. Prior to April 30 the scale averaged 49.625 cents an hour.

Similarly after a conference employees of the company at Peoria, Ill., have agreed upon a 5-cent an hour increase for trainmen and motor coach operators and a 2-cent increase for shop men.

The scale is retroactive to May 1 and will be in effect a year. It adds about $25,000 annually to the labor overhead. The maximum pay will be 55 cents under the new scale. The men sought a 10-cent increase. The company offered a 2-cent raise.

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Rehearing on Tax Issue Denied City of Seattle

The city of Seattle, Wash., recently lost another point in its opposition to the payment of three-fourths of the 1919 taxes of the Seattle Municipal Railway system, purchased in that year from the Puget Sound Power & Light Company, when the United States Circuit Court of Appeals at San Francisco denied the city's appeal for a rehearing. The court had recently decided that the traction company's claim constituted a cause of action in equity and must be tried on its merits. Unless the city asks a writ of certiorari in the United States Supreme Court the power company's action to recover three-fourths of the taxes will be heard in the federal court in Seattle.

The appeal that was made for a rehearing was on the ground that the court passed on issues that were not before it. The amount involved, with interest, is approximately $650,000.

Men Seek Arbitration

William O. McGowan, chairman of the union's joint conference board, recently announced that the men employed in the twelve divisions of the Eastern Massachusetts Street Railway, Boston, Mass., had voted to reject an offer made by the company in answer to its request for a wage increase. The men have decided to ask for arbitration.

Demands made by the men for higher wages and better working conditions have been the subject of conferences for some weeks now. The men are asking an increase in wages from the present rate of 54 cents to 70 cents, as the basic rate, and a differential of 8 cents in favor of the one-man car operators. The new scale, if a new one is awarded, will be retroactive to May 1, the date of the expiration of the old agreement.

Binghamton Paper Wants Franchise Settlement

The Binghamton *Press* is pulling for a new franchise for the Binghamton Railway, Binghamton, N. Y. It seems that the Binghamton Railway has been living from year to year. Yes, living from year to year. Theoretically the company and the city are in mortal combat, but practically all is harmony. The city is jealous of its supposed rights over the matter of fares, and so while it has from year to year permitted the increased fare to be charged, the case on its merit is before the courts. It has, in fact, been there six years. In a recent issue the *Press* said editorially:

> The question to be determined is whether (under the original franchise fixing a 5-cent fare) the city still retains the right to determine what the fare shall be or whether this right may be exercised by the Public Service Commission without approval by the city.
>
> If the Appellate Court sets aside the writ of prohibition and a trial court decides that the Public Service Commission has exclusive authority over the fare that may be charged the railway will be in a position to go ahead with its plans for financial reorganization.
>
> If the city has that right, the situation will not be so simple. For the city has been granting an extension of fare for only one year. It might refuse to renew the 7-cent fare agreement.
>
> Such a refusal, in our opinion, would not be justified. But as long as it remains possible capitalists are going to be slow about investing money in the local company.
>
> The interests of the city and the interests of the street car company are to a large extent identical. The people of Binghamton want to deal fairly by the company. They must do so if they are to get the service they require.
>
> But it is hardly just to the company to ask it to accept a fare agreement running for only one year. And if the city wins its case in the higher court (as we hope it will) some arrangement ought to be made, a new franchise if necessary, that will protect the rights of the city and will strengthen the financial position of the company.

"Now, My Idea Is This!"

Guy C. Hecker, special engineer of the American Electric Railway Association, attained to the editorial page of the New York *Evening Post* on May 25 in one of that paper's "daily talks with thinking New Yorkers on subjects they know best." His subject was "Standardization as It Affects Our Electric Railways." He told about the comprehensive program of standardization that has been carried on since 1906 under the auspices of the American Electric Railway Engineering Association.

There is nothing particularly new to the industry in this review by Mr. Hecker of the work that has been carried on, but it was an achievement on his part to be able to bring the work to the attention of the general public, and then to do it as clearly and forcefully as he did in the interview. On the general subject of standardization Mr. Hecker said:

> There can no longer be any question of the vital necessity, not only in the electric railway and railroad industries, but in all industry, for co-operative effort on a nation-wide scale to bring about simplification and standardization, with its enormous possibilities for lower cost of production.
>
> The railroads and electric railways are the arteries and veins of the country. Upon the intelligent and economical expansion of these facilities depends, to a great extent, the future progress of the nation. These vital industries can effect economies through standardization which will contribute materially to the progress and growth of the nation's business and social life.

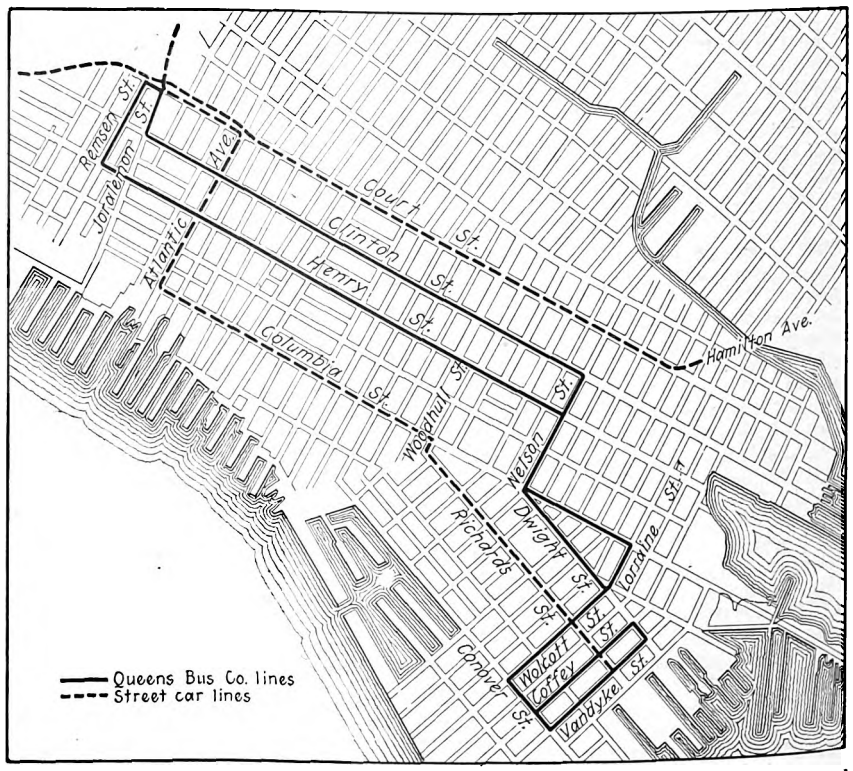
Compromise in Freeport Results in Franchise Adoption

Two years of strife between the Illinois Northern Utilities Company and the City Council of Freeport, Ill., has ended with the adoption of an ordinance granting to the company a railway franchise covering a term of twenty years. The company has been operating for two years without a franchise on all of its lines except the Homer Street extension. The company has refused to accept a franchise which required it to pave between the rails.

A compromise was reached whereby the company agrees to pay for the foundation for the pavement between the rails.

Three Brooklyn Roads Enjoin Bus Company

The Brooklyn City Railroad, the Coney Island & Brooklyn Railroad and the Nassau Electric Railroad have secured from Supreme Court Justice John MacCrate, Brooklyn, a temporary injunction to restrain the Queens Bus Lines, Inc., from operating two bus lines in competition with surface lines of the three companies. The restraining order was obtained on Friday, May 22, was served at once and the following day at 2 p.m. the bus line withdrew service. The case is returnable on June 1. The bus lines run from Borough Hall to Erie Basin and Park Circle to Erie Basin. William N. Dyckman, representing the Brooklyn City Railroad, alleged that the bus lines were being operated without a permit from the Board of Estimate or a certificate of convenience and necessity from the Transit Commission.



Territory in Downtown Brooklyn in Which Competitive Bus Service Has Been Restrained

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Recent Bus Developments

Indiana Interurban Develops Intensive Bus Program—Activity Reflected in More than a Dozen Other Items

INDICATIONS that the Union Traction Company of Indiana plans to enter the bus field somewhat more extensively than heretofore were seen on May 14 in petitions which the company filed with the Public Service Commission. One petition asked for permission to abandon car service on three city lines in Muncie, another asked for authority to supplant railway service with bus service, a third sought permission to operate a bus line between Indianapolis and Kokomo, and the fourth was an application for permission to operate a bus line from Indianapolis to Muncie. Both of the overland routes parallel interurban lines operated by the company between the same points. Each petition was filed in the name of Arthur W. Brady, receiver.

The three Muncie lines which the company seeks to abandon are the Avondale, Beacon and West Side lines. The ground for the abandonment set out was that the cost of operating the lines several months had exceeded the gross revenue and that serious deficits had been incurred. The low earning power of these lines in the last three years had been due to the operations of "jitneys" in the streets, the petition said.

The applications for bus lines in each case asked for beginners' permits. In the case of the Muncie city lines the traction company set out that it would operate in competition with three present operators, who, the traction company's petition contended, are operating illegally and without right either under statute or city ordinance. Sixteen buses are to be acquired for use on the three city lines. In regard to the Kokomo line the company said it would operate six buses and would compete with three bus companies.

Further expansion of its bus system is planned by the New York State Railways in the application of its subsidiary, the Rochester Railway Co-ordinated Bus Lines, Inc., to the City Council for permission to operate a bus line in north side suburban and city territory, to connect with the proposed Irondequoit line and to intersect four city railway routes. This application follows appeals for the route by residents of the territory. The plea for a franchise asks for the right to run either buses or trackless trolleys. It is expected that buses will be installed first, and later, if traffic conditions warrant, they will be supplanted by trackless trolleys. The railway now operates successfully a crosstown trackless line over the Driving Park Avenue bridge.

The Twin City Motor Bus Company, auxiliary of the Twin City Rapid Transit Company, Minneapolis, Minn., has applied to the State Railroad and Warehouse Commission under the new bus control law for retention of its present bus routes from St. Paul to White Bear and Bald Eagle, Minn.; St. Paul to Dellwood via Glouster; St. Paul to White Bear, Minn.; St. Paul to Lake Elmo and Stillwater; also a bus line between Glen Lake and the Minnetonka suburban line of Minneapolis, which is operated to carry electric railway passengers on transfer to and from Glen Lake Sanitarium. The company has also applied for maintenance of its interurban line on University Avenue between Minneapolis and St. Paul, 11.2 miles, and for a new route on Lake Street and Marshall Avenue, 11.5 miles, which in part is the same route as that already maintained by an independent bus company, between the business centers of the two cities. The Twin City Rapid Transit Company is considering the question of operating ten double-deck buses from downtown to the city limits on Nicollet and Lyndale Avenues. The route must be approved by the City Council, and then by the State Commission.

The Capital Traction Company, Washington, D. C., recently applied to the Public Utilities Commission of the District of Columbia for permission to run a bus line with a 25-cent fare from Chevy Chase to the Capitol. The company plans to operate on a 20-minute schedule buses accommodating between 30 and 35 passengers. The company will also apply for a permit to operate a bus looping through Chevy Chase, D. C., as a feeder for the Connecticut Avenue car line with an 8-cent cash fare, six tokens for 40 cents and 2 cents additional for a transfer to the street car.

Members of the City Council of Dubuque, Iowa, have approved the Dubuque Electric Company's plan for the operation of buses to supplement its electric railway service in sections of the city not reached by railway lines. A fare of 10 cents will be charged. There will be no interchange of transfers between the two modes of transport. The new service will be distinctly separate from the traction system. Investment in the new service will be about $50,000. Pay-as-you-enter buses of 25 or 29-passenger capacity will be used. The system will probably be in operation June 20.

Franklin T. Miller, receiver of the Boston & Worcester Street Railway, has been authorized by the Massachusetts Supreme Court to operate bus lines in Boston, Waltham, Newton, Marlboro, Worcester, Ashland, Brookline, Grafton, Hopkinton, Hudson, Natic, Northboro, Shrewsbury, Southboro, Sudbury, Watertown, Wayland, Westboro and Weston.

The Board of Public Utility Commissioners of New Jersey recently approved the application of the Public Service Railway to suspend service on a portion of the Governor Street line in the city of Paterson conditionally on the substitution of five buses to serve the Governor Street route. The city of Paterson, the Public Service Railway and the Public Service Transportation Company agreed that bus service be substituted for trolley service.

Notice has been given by the Indiana Public Service Commission of a hearing at Indianapolis on the application of the Chicago, South Bend & Northern Indiana Railway for authority to operate a bus line from South Bend to Michigan City. The line will pass through the towns of LaPorte and New Carlisle.

Formal approval has been given by the New Jersey Board of Public Utilities Commissioners for the abandonment of electric railway service by the New Jersey Interurban Company between Phillipsburg and Port Colden, N. J., and the substitution therefor of a bus service by the New Jersey Interurban Coach Company between Phillipsburg and Hackettstown. Service on the line, which has been in operation about twenty years, was discontinued last January as the result of heavy snowstorms.

Through interstate bus service was established May 20 between Indianapolis and Louisville by the Interstate Public Service Company. Two buses will leave each terminal daily. The service parallels the Interstate company's traction lines. Passengers bound for the terminals will be taken on at any intermediate point, but none will be taken on at the terminals for any of the intermediate points. For several months the railway has been operating a bus line between Indianapolis and Franklin and only recently bought the competing Jackson Highway line to Franklin. It has for a short time been operating buses to Seymour, touching Greenwood, Franklin, Edinburg and Columbus, and had a line between Scottsburg and Jeffersonville.

The Boston Elevated Railway, Boston, Mass., is charging a 6-cent fare on all its buses where formerly the charge was 5 cents. General Manager Dana secured approval of the 6-cent fare from the authorities in all the cities and towns in which the company operates. Many of the city authorities objected at first, but have since withdrawn their opposition.

The Des Moines City Railway will operate a system of passenger, freight and express buses to various points in central Iowa, if a proposed line to Newton proves a success, President Frank C. Chambers recently stated. The Des Moines & Central Iowa Railroad, a subsidiary of the company, was granted a permit to operate to Newton, Mitchellville and Colfax.

After a survey of traffic conditions between Baltimore and Washington, officials of the Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., have decided not to install any bus equipment for use on the Washington Boulevard between Baltimore and Washington. George T. Bishop, president, said that it was quite evident that a bus line between Baltimore and Washington would be operated at a loss. He further stated that the decision did not mean that the company had discarded the idea of using buses to supplement its regular train service, but that, on the contrary, the company expected to install buses as feeders to its railroad lines wherever public convenience required them.

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Sale of Tickets Withdrawn at Youngstown

Tickets which were being sold by the Youngstown Municipal Railway, Youngstown, Ohio, so as to provide 25 rides for $1.25 have been withdrawn after a trial period of three weeks. From the test made with them it appeared the sales would not justify any expectation of building traffic. The idea behind the plan was to restore in a measure the 5-cent fare. It was distinctly stated at the time the tickets were put on sale that the plan was an experiment. No transfers were issued on fares paid by use of the ticket. During the time of the experiment there was no change in the rate of fare which had existed previously, namely, 8 cents cash or seven tickets for 50 cents, with a 1-cent charge for transfer on either cash or ticket fare.

Taxicab Ordinance Recommended for Los Angeles

Steps to eliminate cruising taxicabs from the downtown section of Los Angeles have been taken by the public safety committee of the City Council in recommending adoption of a new taxicab ordinance. The new measure is intended to give the Board of Public Utilities jurisdiction over the "for hire" automobiles and taxicabs. Designated stands in the downtown district will be assigned to taxicabs under the new plan. The present stands are assigned only in the outlying districts. Use of the stands would be prohibited during the no-parking period between 4:30 and 6 p.m.

Higher Fares Sought in East St. Louis

The East St. Louis & Suburban Railway, East St. Louis, Ill., has applied to the Illinois Commerce Commission for authority to increase its rates in the city of East St. Louis. The present cash fare is 8 cents, two tokens for 15 cents and four tokens for 30 cents. The company seeks to raise the cash fare to 10 cents, but would continue to sell four tokens for 30 cents if the application for the new rates is granted.

W. H. Sawyer, president of the company, said that the increased fare is needed to offset loss in patronage due to increased automobile traffic. He said that about 75 or 80 per cent of the patrons purchase tokens and that the requested increase would affect only the occasional rider who purchased a single fare. The effect, as a result, would be only moderate, and the application was considered necessary by the company because automobile traffic had decreased the car traffic approximately 5 per cent. The added income would barely equal the loss, he believed.

Fares Increased.—Street car fares in Ames, Iowa, have been increased from 5 to 7 cents by the Fort Dodge, Des Moines & Southern Railroad. The company, however, has conceded the sale of seventeen tickets for $1. C. H. Crooks, president of the company, said increased operative and fixed charges made the fare advance necessary.

News Notes

Token Carriers for Sale.—The International Railway, Buffalo, N. Y., is selling thirteen tokens and a metal token carrier for $1. Passengers are told by the railway that these token carriers cost about 4 cents each in large lots, but that they are being sold below cost to facilitate the handling of tokens. The company reports that an unusually large number of passengers are buying their tokens in $1 lots rather than two for 15 cents as heretofore.

Higher Fare Permitted.—Following a hearing on Jan. 28, at which both sides were represented, the North Carolina Corporation Commission recently granted in part the petition of the Tidewater Power Company for increases in city and suburban railway fares in and near Wilmington. The commission granted requested increases of 5 cents on most of the suburban lines out of Wilmington and modified a request for an increase within the city. The company was permitted to change its fares from 7 to 8 cents instead of from 7 to 10 cents. Four tickets will be sold for 30 cents, which was also proposed under the 10-cent fare. A request to sell a weekly pass for $1.25 was also allowed.

Lower Fares for Washington, Pa.—To encourage more short-haul travel, the Pittsburgh Railways reduced fares on May 18 on its Washington local lines from 6 cents to 5 cents cash and cut the price of the weekly pass from 95 cents to 75 cents.

Electric Car for Economy.—As a means of reducing operating costs on its branch line, the Halifax & Southwestern Railway has decided to install electric service between Lunenburg and Mahone Junction.

Pottsville Adopts Weekly Pass.—The East Penn Electric Company was to establish on May 25 the weekly pass in Pottsville, Pa., at the cost of $1.25, against a cash fare of 10 cents and a token fare of 8⅓ cents. An important change is to be made in the manner of selling tokens. Instead of offering them at twelve for $1 through a single sales place they will be available on the cars at three for 25 cents.

Increased Fare Proposed.—The Rochester, Lockport & Buffalo Railroad Corporation, Rochester, N. Y., has filed with the Public Service Commission a new local passenger tariff, effective June 16, proposing an increase of ¼ cent a mile in commutation fares, cash ticket fares and mileage book price. The redeemable excess fare regulation is changed so that excess charge will be made on fares over 12 cents instead of 16 cents. In a statement accompanying the tariff the corporation states that its passenger revenue for the year 1924 showed a decrease of $38.000 as compared with 1923 and for the first four months this year a decrease of $8,000 as compared with 1923. In the same time taxes have increased substantially, the statement says. The passenger revenue in 1924 was $396,858, against $434,854 in 1923. For the first four months of the present year the passenger revenue was $136,969, against $145,001 for a similar period in 1924.

New Fares Approved.—The Public Service Commission has approved a new schedule of fares on the lines of the Southern New York Railway, effective June 14. Local fares for 30-trip family tickets, good for transportation of purchaser and member of his family within 30 days from date of sale, are as follows: Between West Oneonta and Oneonta, $3.75; Laurens and Oneonta, $7.50; Index and Cooperstown $2.85; Cooperstown and Fly Creek, $5.75; Cooperstown and Toddsville, $3.75. These rates will be good in either direction between these stations.

One-Man Cars Under Fire.—Considerable pressure is being exerted upon the Portland Electric Power Company, Portland, Ore., to eliminate one-man cars in the congested district. F. I. Fuller, vice-president of the company, has consented to use a "loader" in the loop district to assist passengers to board the cars. Mr. Fuller has protested a ruling that allows autos to park for one hour while street cars are limited to a maximum of three minutes.

Service of 47 Years Commended.—Because of his 47 years in the service of the United Railways & Electric Company, Baltimore, Md., John Lessner, veteran line superintendent, was fêted and eulogized by officials recently. Mr. Lessner, who had been a line superintendent since 1895, was, at his request, relieved of these duties on Jan. 1 and placed in charge of the Park Terminal carhouse, where center several of the lines over which he had exercised supervision for many years. President Emmons and Vice-President and General Manager Palmer spoke highly of his valuable service.

West Penn Applies for Passes.—Application is to be made by the West Penn Railways for a $1 weekly pass to cover local riding in Connellsville and South Connellsville, Pa., against a cash fare of 8 cents and a ticket fare of 6¼ cents. The company also plans to install a Sunday-holiday pass for May 30 or May 31 for 50 cents between any point in Greensburg and either the Trafford City or McKeesport terminus. The regular fare to Trafford City, eight zones from Greensburg, is $1.28 round trip cash fare or $1 ticket rate.

Must Decide on Franchise.—The City Council of Decatur, Ill., has notified the Illinois Power & Light Corporation to give an answer before May 29 on the railway franchise which has been under consideration several months. Terms of the franchise have been practically agreed upon except for sections covering paving of three streets. Unless an agreement is reached soon, the city will not be able to pave the streets this summer. A referendum will be necessary to decide whether a clause for the purchase of the utility will be included and then another referendum upon the franchise proper.

Electric Line to Open Its Summer Resort.—The Denver & Interurban Railroad (Kite Route) will reopen for the season on May 24 its beauty spot in the Rockies, Eldorado Springs, located about 30 miles north of Denver.

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Foreign News

Fare Reductions in Britian

In spite of trade depression and widespread unemployment, various British tramway undertakings are reducing fares. Perhaps it is encouraged by the fact that in regard to most of the undertakings (apart from London) traffic receipts as compared with a year ago show a rising tendency. The Torquay Tramway Company has reduced the fare for the three-mile journey between Torquay and Paignton from 3d. to 2d. Sunderland Corporation Tramways has returned to pre-war fares. In Sheffield children under fourteen years of age may now travel the whole length of any tramway route, in some cases more than 4 miles, for a halfpenny. The Glasgow Tramway Committee is recommending to the Town Council the adoption of a maximum fare of 2d. between the center of the city and suburban termini. Halifax is reducing fares by 25 per cent.

Russian Electrification Progressing

A beginning has been made on the program for the development of electrification of the railways of the Soviet Union, according to bulletins received from Moscow by the Russian Information Bureau in Washington. Several of the Moscow suburban lines are being electrified, and also the Suram mountain pass section of the Transcaucasian Railroad, between Tiflis and Batum. In all 94 miles is being completed. An additional 105 miles will shortly be begun, including the electrification of the Leningrad suburban railways. The general electrification program calls, first, for the electrification of suburban and mountain lines and eventually for the establishment of electric trunk lines adapted to the transport of trains up to 7,000 tons.

Urban trolley systems are also increasing their mileage this year. Before the war 35 cities had electric railways. During the World War and the civil wars about half of the lines went out of business. By 1920 fifteen had ceased operations altogether and eight were running only four months of the year. By the end of 1924 the pre-war mileage was restored and lines had been opened in three additional cities. The volume of traffic has doubled in three years, though still somewhat below the pre-war figures. About 1,000 new cars will be needed this year, of which 385 are already being built in domestic factories.

French Company Earns Nearly Four Million Francs

The Compagnie Générale Française de Tramways, which operates the street cars of Le Havre, Marseilles, Orléans, Nancy and the Cambria-Saint Quentin interurban line, made a profit of 3,799,023 francs as a result of 1924 operation, according to its annual report. Operating agreements in the various cities will come to an end on Dec. 31 next, by virtue of an accord entered into with the various municipalities in 1919.

Only in Le Havre has a definite rearrangement been reached. Here all the fixed property and rolling stock have been kept up to as high a state of efficiency as possible. Advances have been made to the company by the Havre municipality. Extension of the lines and other work is far advanced with a view to more favorable operating arrangements to be made during the present year, before the expiration of existing franchise and the adoption of the new agreement.

At Orléans and Nancy, as well as at Le Havre, salaries of employees have been raised. A corresponding rise in fares has been put into effect and others are in prospect.

The Marseilles lines are to be extended in accordance with an agreement signed with the municipality last year. The question in Marseilles is complex and the service in all respects is arduous. The city itself has started a supplementary bus service, which has given rise to much criticism.

For the Compagnie des Tramways de Cambrai et de Saint Quentin, in the reconstructed war zone, an agreement has been arrived at with the municipality of Saint Quentin for the reconstruction, modification and operation of the line, a large part of which was destroyed during the German occupation. War damage funds have helped to improve the possibilities of this line, which is one of the few interurbans of importance in France.

At the Cambrai end, also in the war zone, the situation is less satisfactory, the demands of the company having been met with indifference. War damages for this terminal have not yet been assessed or even urged by the municipality, although it is said the company expects municipal co-operation. It is possible that there will be an entire reconstruction and a new agreement for the Cambrai section. As it is considered desirable to delay a definite agreement until the line is rehabilitated and construction of the company's own power plant is completed, a temporary agreement to run for two years has been made.

Austrian Hydro-Electric Affects Transport Progress

Exploitation of hydro-electric power in Austria is making notable progress by reason of the potential demands to be made upon Austria's water-power resources by various electric transport schemes. Electric traction has been recently extended to the trains running through the Arlberg tunnel on the international line. The Landeck-Bludenz line will be electrified in the course of the year. Work during the year will include electrification from Bludenz to Buchs and Bergenz to link up the Austrian electric system with that of Switzerland.

Buses Compete with Glasgow Municipal Tramways

Privately owned buses are competing with the municipal tramways and especially with the suburban steam railways. The buses come from the country into the center of the city and return. The strangest part of the matter is that not one of these buses is licensed by Glasgow. That has come about in consequence of the peculiar provisions of the Glasgow police act of 1866 covering stage carriages and stage coaches. The stage carriage is defined as a passenger vehicle running between the city and any place within 5 miles of its center. A stage coach is a vehicle carrying passengers for longer distances. The stage carriage is required to be licensed by the magistrates, but not the stage coach. The latter, however, is forbidden by the act of 1866 to take up or set down passengers within the 5-mile radius. As a fact, the buses do pick up and set down passengers in the city and thus should be licensed.

James Dalrymple, tramway manager at Glasgow, has been trying for some time to get the authorities to prosecute the proprietors of the buses for using them as stage carriages and thus plying for hire without a license. It seems probable that a test case will be brought. If the bus owners then apply for licenses, Mr. Dalrymple thinks that the magistrates, in conjunction with the tramway committee, should lay down the condiitons on which the licenses would be granted. If the bus owners objected to the conditions, the licenses would be refused and the matter placed before the Ministry of Transport.

At Liverpool the problem has been met by the city granting running rights to a company known as Ribble Motor Services, Ltd. Passengers are picked up or set down by this company only within the city at certain specified points, and no passengers are picked up on the inward journey or set down on the outward journey while the bus is traveling within the city boundary. Thus the municipal tramways are protected.

Italian Street Car Lines Produce Little Profit

The Turin Street Car Company, controlled by Belgian capital, produced a net profit for 1924 of only 593,565 lire.

The Naples Tramways met with an operating loss of 204,272 lire, making a cumulated deficit of more than 20,000,000 lire.

The Tramways of Florence produced a deficit amounting to 1,801,552 lire, making a total corporate deficit of more than 20,000,000 lire.

Automatic Ticket Machines. — The London Underground companies have placed an order for 50 automatic ticket machines of an improved design which will still further speed up the issue of tickets to the passenger. Fifty tickets can be delivered by the "press of a button" by the new machines as against five tickets by the older type. Further improvements have also been made in the "dating" mechanism, so that each of these 50 tickets, although issued from the machine almost instantaneously, will be dated as it passes through.

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Financial and Corporate

Michigan Road Sold

Operating Officials Take Over the Muskegon Interurban, a 45-Mile Line, for Intensive Development

Sale of the Grand Rapids, Grand Haven & Muskegon Railway, Grand Rapids, Mich., by the United Light & Power Company to Sidney L. Vaughan and associates has been confirmed by Richard Schaddelee, senior vice-president of the holding company. The entire interest of the United Light & Power Company will pass to a group headed by Mr. Vaughan and William K. Morley. Mr. Vaughan has been vice-president and general manager of the interurban for several years. Mr. Morley was active manager until a few years ago.

The sale terms were not made public, but it was announced that the outstanding common stock, amounting to $1,200,000, has been acquired by the new owners. The company has outstanding $1,500,000 of first mortgage bonds which mature July 1, 1926.

The new directors are William K. Morley, S. L. Vaughan, Thomas F. Carroll, L. A. Goodrich, G. R. Wilber, H. R. Green and H. P. Rademaker, all of Grand Rapids.

Mr. Morley has been elected president of the company. Other officers are: Sidney L. Vaughan, vice-president and general manager; G. R. Wilber and H. R. Green, vice-presidents; L. A. Goodrich, secretary-treasurer; H. P. Rademaker, assistant secretary and assistant treasurer.

Mr. Carroll has been a director of the company since its incorporation in 1899 and is the corporation's general counsel. Mr. Green, Mr. Wilber and Mr. Rademaker are officials of the United Motor Products Company.

The company was organized in 1899. The road itself was completed two years later and was under Mr. Morley's management for many years. The United Light & Railways Company, later the United Light & Power Company, acquired a controlling interest in the interurban nine years ago. The company has 45 miles of main line trackage connecting Grand Rapids with Grand Haven and Muskegon.

An official statement reads:

> The Muskegon Interurban for years has been a successful company, but has recently suffered, in common with all other interurban companies, from the competition of the privately owned automobiles and more recently from the unbridled competition of the heavily subsidized common carrier freight trucks and buses, which are practically paralleling its route between Grand Rapids and the other terminals.
>
> The United Light & Power Company has been looking for a purchaser of the property for some time and finally found one in Mr. Vaughan and his associates, who hope, by careful management and the exercising of rigid economy, to continue operations, relying on good service and the good will of the territory served to enable them to do a profitable business. W. K. Morley, up to recently the active general manager of the property, and Sidney L. Vaughan, who succeeded him, carry with them the well wishes of the officials of the United Light & Power Company, which has severed all connection with the property.

A few months ago the Grand Rapids, Grand Haven & Muskegon Railway announced that it was the only interurban in Michigan that was not operated under a receivership. At that time it was declared that the courts would be asked to appoint a receiver, but no action has been taken along this line.

The policy of the company will not be changed for the present, officers announce, but Mr. Vaughan is seriously considering attracting business to his line by granting special round trip rates, with one-day privileges. These rates will be lower than the bus rates and are expected to attract considerable business because of the advantage which the interurban holds.

City Attitude at Buffalo Not Liberal

Further negotiations between representatives of the International Railway, Buffalo, N. Y., and the municipal authorities on the proposed city-company plan of service-at-cost depend upon the attitude taken by the company toward the $20,000,000 valuation on the railway property, fixed by the city committee as the basis of service-at-cost negotiations. The city is willing to admit a valuation of $20,000,000 and allow a 6 per cent return on this valuation. The valuation recently fixed by the Public Service Commission as the basis of the 7½-cent fare was $22,000,000. The company claims a valuation of $60,000,000. A 6 per cent return on the $20,000,000 valuation fixed by the city would make possible guaranteed earnings of $1,200,000 annually. The interest on the company's outstanding bond issues is $1,100,000 annually.

Surplus Over Charges Greater on Southern Property

Virginia Railway & Power Company Forging Ahead Consistently—Interesting Railway Statistics in Annual Report—Proposal Advanced for $1,000,000 Bus Program

GROSS earnings of the Virginia Railway & Power Company, Richmond, Va., for the year ended Dec. 31, 1924, were $10,454,047, a decrease over the previous year of $54,561, or 0.52 per cent. Operating expenses decreased $93,094, or 0.33 per cent. The gross income from all sources was $3,758,871, an increase of $67,506, compared with the previous year.

The expenditures for maintenance of way and equipment were $853,136, or 17.96 per cent of the gross railway earnings, as against $865,640.89, or 17.28 per cent, for the previous year.

During the year the State Corporation Commission of Virginia assumed jurisdiction over the Petersburg railways and also over the Richmond railways. In the latter case the decision of the commission was affirmed by the Supreme Court of Appeals of Virginia upon appeal taken to that court by the city of Richmond. This places all of the properties of the company under the jurisdiction of the State Corporation Commission of Virginia. According to T. S. Wheelright, the president, it affords a credit base that will enable the company properly to expand and meet the increasing demands for transportation as well as light and power service throughout the large part of the state covered by its lines.

The company now serves about 25 per cent of the population of the State of Virginia. Its light and power lines furnished electric service to 71,759 cus-

INCOME OF THE VIRGINIA RAILWAY & POWER COMPANY FOR YEAR ENDED DEC. 31

	1924	1923
Gross earnings	$10,454,047	$10,508,608
Operating expenses	6,987,270	7,080,364
Operating revenue over operating expenses	$3,466,776	$3,428,243
Other income	292,095	263,122
Gross income	$3,758,871	$3,691,365
Taxes and licenses	812,357	739,666
Income applicable to fixed charges and rentals	$2,946,514	$2,951,699
Fixed Charges and Rentals:		
Interest on outstanding funded debt	$1,288,290	$1,190,522
Interest on car equipment notes	6,000	10,000
Sinking fund payments	224,995	206,288
Norfolk Railway & Light Company rental	99,000	99,000
Miscellaneous interest	20,165	27,525
Total fixed charges and rentals	$1,638,450	$1,533,337
Surplus over fixed charges and rentals	$1,308,064	$1,418,362
Other Charges:		
Proportion of discount and premium on sale and purchase of bonds and other securities	$63,215	$36,025
Net miscellaneous charges not operation charged direct to surplus	27,072	219,042
Total direct charges	$90,287	$255,067
Surplus over fixed and other charges	$1,217,776	$1,163,294
Dividends	$538,405	.....
Additional charge to surplus	304,145	.....

RESULTS OF RAILWAY OPERATION AT RICHMOND FOR YEAR ENDED DEC. 31

	1924	1923
Revenues—Railway		
Passenger	$4,667,501	$4,927,440
Freight	12,393	12,516
Mail	1,076	1,090
Total car revenue	$4,680,971	$4,941,048
Outside operations	68,072	68,611
Total railway revenue	$4,749,043	$5,009,659
Operating Expenses—Railway:		
Maintenance of way and structures	$457,234	$471,887
Maintenance of equipment	395,902	393,753
Power	286,174	388,781
Conducting transportation	1,577,040	1,611,762
Traffic	7,058	4,537
General expenses	1,043,725	1,036,574
Total railways	$3,767,135	$3,907,296

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tomers during the past year, an increase of 5,165 customers over the previous year, and its railway lines carried a total of 75,580,824 revenue passengers for the year, a decrease of 4,566,845 compared with the previous year.

During the year the property account of the various division was credited with $2,022,028, representing the value of property reconstructed, abandoned and dismantled as unserviceable and other property transferred from one division to another, viz.:

Railway Department:	
Richmond Division	$474,653
Petersburg Division	70,235
Norfolk Division	132,520
Portsmouth Division	460,041
	$1,137,449

Properties constituting the system of the Virginia Railway & Power Company for the fiscal year ended Dec. 31, 1924:

	Total Miles of Single Track
Track Mileage:	
Richmond City	79.333
Henrico County	5.629
Chesterfield County	21.024
Prince George County	0.428
Dinwiddie County	4.250
Petersburg City	8.806
Norfolk City	84.522
Norfolk County	19.673
Portsmouth City	19.681
Total	243.346

In order to supplement its present railway service and meet the increasing demands for transportation, the company proposes to add buses to its equipment and operate a unified service by issuing transfers as between the two types of service, thus enlarging the scope and adding to the flexibility of its transportation system. To supplement the present railway service with bus operation will involve an expenditure of approximately $1,000,000.

Early in the year the company acquired 19,942 shares of a total of 20,000 shares outstanding of the capital stock of the Roanoke Rapids Power Company at a cost of approximately $1,000,000. In the light and power department capital expenditures during the past year amounted to $1,856,634.

Approximately $2,000,000 has been authorized to cover the 1925 construction program, made necessary to safeguard the service and meet the increasing needs of the communities served throughout the system. This amount includes the construction in Richmond of two automatic substations serving the railway and commercial customers in the north and west ends of Richmond, one automatic substation serving commercial customers in the far west end of Richmond, a hydro-electric generating station in South Richmond and the construction of a 110,000-volt transmission line between Suffolk and Roanoke Rapids, at an estimated cost of $800,000, including right of way, to connect the Roanoke Rapids Power Company with the power system of the Virginia Railway & Power Company. In connection with the construction of this line, substations will be erected at Suffolk and at Roanoke Rapids.

The expenditures during the fiscal year ended Dec. 31, 1924, for additions, extensions and betterments to property and charged to capital account were $2,546,556. Capital expenditures in the railway department during the year totaled $492,196. They may be summarized as follows:

Railway Department:	
Richmond Division	$316,636
Petersburg Division	73,417
Norfolk Division	88,141
Portsmouth Division	14,001
	$492,196

Buses Help Interurban Earnings

Operation of buses from its terminus at Winton Place to Cincinnati, Ohio, was partly responsible for the increase in passenger traffic on the Cincinnati & Dayton Traction Company's lines last year, according to the annual report of George P. Sohngen, receiver, filed in the Court of Appeals at Dayton. The increase in receipts over the Hamilton to Cincinnati division was put at $17,724 over those for the preceding year. Elimination of bus competition between Dayton and Middletown enabled an increase of $9,157 over 1923. Hamilton city lines, a part of the system, showed a decrease of $2,127. Gross income on the Hamilton city lines was $213,995 and operating expenses $138,599. The Dayton city lines showed a decrease of $4,178. In both cases where losses were shown traction officials blamed a general depression in business. Five divisions are included in the report. They are the Southern Ohio and the Dayton Traction Company, Cincinnati-Hamilton division, Dayton city division and C. N. & W. division, which showed a grand total of 9,425,230 passengers carried. Freight receipts showed an increase, excepting on the C. N. & W. division.

Foreclosure Decree Signed at Kansas City

Judge Kimbrough Stone at Kansas City, Mo., has signed the decree of foreclosure against the Kansas City Railways. No date has been set for the sale, however, that detail being left to John T. Harding, special master in the receivership, who will conduct the sale.

The decree signed by Judge Stone is a printed document of 173 pages. It contains a description of all of the property owned by the railway and embraces the court's rulings on the priority of the principal claimants. It does not give to the first mortgage bondholders more than the amount of their lien against the property. If the sale price is sufficient to produce more than enough to satisfy the first mortgage holders and pay their interest, the second mortgage bondholders will share, then Mr. Armour's claim will be satisfied, and finally the stockholders will participate. The court will dispense any further proceeds.

Interests dissenting from the decree's provisions have three months in which to appeal from the rulings of Judge Stone.

A new ownership of the railways by Jan. 1, 1926, is not unlikely. As soon as the appeal time has elapsed, the progress in winding up the receivership is expected to be rapid. Perhaps by late summer Mr. Harding will be ready to fix a date for the sale. Thirty days' notice will be required, then the sale will be held and the bids certified to Judge Stone. In the meantime, the court's valuation of the property will have been completed, giving the court accurate information as to what the sale value of the property should be.

Toronto Paid $671,538 Arbitration Costs

The amount of the costs to the city of Toronto, Ont., in connection with the arbitration proceedings under which it purchased the Toronto Railway was $671,538, and in connection with the appeal to the privy council against the award $25,573, a total of $697,111. Among the fees to experts the following payments were made: W. S. Murray, $26,268.99; A. S. Richey, $86,759.12; C. A. King, $36,614.20; C. R. Harte, $9,105.91; W. D. Pence, $4,136.22; T. Scullin, $1,992.10; C. H. Clark, $2,614.44; R. M. Feustal, $2,998.36; C. Remelius, $4,454; W. S. Twining, $615.32; A. T. Spencer, $1,090.00.

RAILWAY STATISTICS OF THE VIRGINIA RAILWAY & POWER COMPANY

	Richmond		Petersburg		Interurban		Norfolk		Portsmouth		Total	
	1924	1923	1924	1923	1924	1923	1924	1923	1924	1923	1924	1923
Revenue passengers	41,715,344	42,402,172	3,357,365	3,880,752	1,767,468	1,975,358	25,018,674	27,479,653	3,721,631	4,409,392	75,580,482	80,147,327
Transfers and free passengers	13,566,972	13,672,124	654,489	716,241	102,862	19,844	4,004,336	4,132,002	519,543	564,781	18,848,202	19,104,992
Total passengers	55,282,316	56,074,296	4,011,854	4,596,993	1,870,330	1,995,202	29,023,010	31,611,655	4,241,174	4,974,173	94,428,684	99,252,319
Percentage of revenue passengers using transfers	31.92	31.56	19.17	18.11	5.4	0.7	14.92	13.92	13.46	12.22	24.22	23.04
Average fare per passenger, including transfers and free	$0.0443	$0.0445	$0.0427	$0.0417	$0.1331	$0.1437	$0.0544	$0.5360	$0.0517	$0.0524	$0 0524	$0.0496
Car-miles	8,883,437	8,648,160	792,570	792,430	828,821	874,318	5,429,982	5,549,964	1,155,559	1,382,590	17,090,369	17,247,462
Car-hours	1,083,750	1,077,413	99,390	100,658	58,519	61,487	596,355	627,279	138,398	173,007	1,976,812	2,039,844
Average passengers per day	151,045	153,628	10,961	12,594	5,110	5,466	79,298	86,607	11,588	13,590	258,002	271,921
Total revenue per car-mile	$0.2781	$0.291	$0.231	$0.2566	$0.3146	$0.3407	$0.2972	$0.3115	$0.1914	$0.1901	$0.2778	$0.2905
Total revenue per car-hour	$2.279	$2.336	$1.842	$2.02	$4.425	$4.844	$2.706	$2.756	$1.599	$1.519	$2.402	$2.456
Operating expenses per car-mile	$0.215	$0.2215	$0.1731	$0.1768	$0.2391	$0.2613	$0.2364	$0.2413	$0.2058	$0.2056	$0.2204	$0.2266
Operating expenses per car-hour	$1.763	$1.778	$1.38	$1.392	$3.362	$3.715	$2.152	$2.135	$1.719	$1.643	$1.906	$1.915

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Lake Shore Electric Railway System Reports Smaller Surplus

A surplus of $92,198 was realized by the Lake Shore Electric Railway System, Cleveland, Ohio, in 1924, against $172,461 for the previous year. These figures include operation by two subsidiary railways and two power companies. The accompanying statements give the income results separately of the Lake Shore Electric Railway, the Lorain Street Railroad and the Sandusky, Fremont & Southern Railway as shown in the 24th annual report.

EARNINGS AND OPERATING EXPENSES OF THE LAKE SHORE ELECTRIC RAILWAY

	1924	1923
Gross earnings	$2,211,518	$2,235,662
Operating expenses and taxes	1,779,879	1,709,889
Net earnings	$431,638	$525,772
L. & C., T. F. & N. and 1st cons. interest	205,975	205,975
	$225,663	$319,797
All other interest	132,724	135,024
Surplus	$92,938	$184,773
Ratio of operating expenses to gross earnings, per cent	80.48	76.48
Car-miles	4,198,831	4,055,508
Income per car-mile, cents	52.67	55.12
Operating expenses and taxes per car-mile, cents	42.39	42.16
Net earnings per car-mile cents	10.28	12.96
Passengers carried	6,242,863	6,967,058
Earnings per passenger, cents	20.84	22.03

DETAILED EARNINGS AND EXPENSES OF THE LAKE SHORE ELECTRIC RAILWAY

Earnings	1924	1923
Passenger revenue	$1,290,162	$1,521,282
Mail revenue	3,671	2,876
Express revenue	180,647	316,173
Freight revenue	458,131	151,070
Transportation	187	178
All other revenue	278,719	244,082
Total	$2,211,518	$2,235,662
Expenses and taxes		
Maintenance of way and structures	$259,085	$239,401
Maintenance of equipment	158,895	153,490
Operating power plants	318,265	368,059
Conducting transportation	610,522	542,676
Traffic	15,364	8,765
General and miscellaneous	272,417	253,177
Taxes	145,329	144,318
Total	$1,779,879	$1,709,889

For additions and improvements charged to capital account the Lake Shore Electric Railway expended $145,889 and the Lorain Street Railroad $64,619.

The Lorain Street Railroad rebuilt 3,450 ft. of single track of 80-lb. rail on concrete base in Lorain. At Elyria, 2,450 ft. of single track was rebuilt with 100-lb. rail on concrete base. Five city cars were purchased and placed in service.

The Lake Shore Electric Railway rebuilt with new 100-lb. rail on concrete base 2,200 ft. of double track at Lorain.

On June 28, 1924, a cyclone struck a portion of the cities of Sandusky and Lorain, killing nearly 100 people and causing great destruction of property. At Lorain especially great damage was done, practically all of the trolley poles, trolley wires, high-tension poles and power and transmission lines of the Lake Shore Electric Railway and about one-half of the lines of the Lorain Street Railroad were destroyed. Two cars were overturned in the streets and the freight station unroofed. The loss in earnings and expense of replacement of damaged property cost the companies not less than $125,000.

EARNINGS AND OPERATING EXPENSES OF THE SANDUSKY, FREMONT & SOUTHERN

	1924	1923
Gross earnings	$119,975	$117,797
Operating expenses and taxes	113,779	108,155
Net earnings	$6,195	$6,641
Interest paid	32,250	32,250
Surplus	*$26,054	*$25,608
Ratio of operating expenses to gross earnings, per cent	94.84	94.21
Car-miles	343,432	235,882
Income per car-mile, cents	34.94	48.67
Operating expenses and taxes per car-mile, cents	33.13	45.86
Net earnings, per car-mile, cents	1.81	2.81
Passengers carried	260,468	293,500
Earnings per passenger, cents	32.35	33.33

*Deficit.

EARNINGS AND OPERATING EXPENSES OF THE LORAIN STREET RAILROAD

	1924	1923
Gross earnings	$286,458	$281,946
Operating expenses and taxes	260,424	263,569
Net earnings	$26,034	$18,377
First mortgage bond interest	27,500	27,500
	*$1,465	*$9,122
Other interest	23,662	24,318
Surplus	*$25,128	*$33,441
Ratio of operating expenses to gross earnings, per cent	90.91	93.48
Car-miles	969,292	935,332
Income per car-mile, cents	29.55	30.14
Operating expenses and taxes per car-mile, cents	26.87	28.18
Net earnings per car-mile, cents	2.68	1.96
Passengers carried	3,773,619	3,676,080
Earnings per passenger, cents	7.59	7.67

*Deficit.

New Richmond Valuation Figure $11,006,987

Allen J. Saville has submitted to the State Corporation Commission of Virginia a valuation report in which he fixes the value of the Richmond property of the Virginia Railway & Power Company at $11,006,987. Mr. Saville includes in his report a table of the percentage of net earnings which would accrue to the company if a 7-cent cash fare were made effective. This is the only fare that he mentions. He does not, however, specifically recommend a 7-cent fare.

In fixing the value of the company's Richmond property at $11,006,987, Mr. Saville has arrived at a valuation much greater than the $7,500,000 fixed for the city in the Beeler report, as of January, 1922, and far below the $16,850,000 claimed by the company as of Jan. 1, 1925.

At the same time it was announced that a separate report has been drawn up by Edwin Wortham, local engineer, for the city, and that this report fixes the present valuation at $7,301,350, which is less than the Beeler valuation.

Counsel for the city and company will have an opportunity to reply to the statements in the Saville report before the State Corporation Commission on June 3, it was announced by the commissioners.

These were the principal developments on May 23 in the Virginia Railway & Power situation. General plans for the future development of the company's traction and light properties throughout the state will await the return to this country of Charles A. Stone of Stone & Webster, who have purchased the controlling interest in the company from Frank Jay Gould.

Improvement in Honolulu in 1924

The total revenue from all sources of the Honolulu Rapid Transit Company, Honolulu, Hawaii, for the year 1924 was $1,014,349, compared with $988,928 for the year 1923. The total operating expenses for the year were $713,930, compared with $618,708 for the year 1923. The number of passengers carried was 19,576,438, against 20,317,672 in 1923. The number of transfer passengers increased from 3,873,923 in 1923 to 4,781,791 in 1924. Total passenger revenue for the year was $992,416, compared with $971,131 for 1923. These facts were made part of the manager's report contained in the annual report for the year ended Dec. 31, 1924. Manager Johnson stated that the decrease of full fare passengers carried and the unavoidable delay in securing the increase of fare resulted in a lower gross revenue for the year than was anticipated; the increase in operating expenses as shown below was due to increased maintenance of tracks and equipment, an increase in price of fuel oil, and the increase of wages put into effect in October, 1923.

HONOLULU RAPID TRANSIT COMPANY, LTD.

Operating revenues	1924	1923
Revenue from transportation:		
Passenger revenue	$990,443	$969,810
Bus revenue	11,844	4,461
Special car revenue	1,972	1,319
Freight revenue	932	2,841
Total revenue from transportation	$1,005,193	$978,433
Revenue from other railway operations:		
Rents of buildings	$2,045	$2,410
Miscellaneous	911	704
Interest	6,198	7,380
Total revenue from other railway operations	$9,155	$10,494
Gross revenue from operations	$1,014,348	$988,928
Operating expenses:		
Way and structures	$88,414	$71,561
Equipment	78,568	59,583
Power	94,812	79,481
Conducting transportation	351,110	318,657
Traffic	5,099	3,721
General and miscellaneous	95,924	85,702
Total operating expenses	$713,930	$618,708
	$300,418	$370,219
Replacements chargeable to operating expenses	25,432	34,518
	$274,986	$335,701
Taxes	$128,577	$135,343
Profit and loss	3,261	
Depreciation	45,089	37,519
	$176,928	$172,862
Net revenue from operations	$98,057	$162,838
Deductions:		
Interest	$1,506	$6,423
Dividends	75,000	190,000
	$76,506	$196,423
Balance 1924 to surplus (Deficit 1923)	$21,550	$33,584

The Kalihi Bus service was continued during the year, and with the increase of fare in October, free transfers to and from street cars were provided. This resulted in considerable increase of patronage. It is expected that with the increased patronage the service will show more profitable operation during 1925. The report states that it will be necessary to supplement the bus equipment for the Kalihi district with the addition of either one or two buses of a more improved type to maintain a favorable operating factor. The management is now studying the advisabil-

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ity of providing a cross-town bus service for Kaimuki, connecting with the Waikiki car line.

Replacements chargeable to operating expenses were made in the different departments during the year as follows: Way and structures, $15,628, equipment, $9,059; power, $385, and general and miscellaneous, $361, making a total of $25,433.

The annual report of the Honolulu Rapid Transit Company also contained a statement of the president, Alfred L. Castle. His statement explained the details of the various fare hearings during the year and gave the history of the decision of the commission in fixing a rate base of $3,250,000. He recommends the abolition of the tax to the city and the county of Honolulu, which meant 2½ per cent of the company's gross transportation revenues.

Net Earnings in Havana Decrease

Gross earnings from operation of the electric railway department of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for 1924 were $5,924,606, an increase of 1.0 per cent over 1923. The net earnings were $1,971,734, or a decrease of 7.7 per cent over 1923. According to the report of the president to the stockholders the relatively unfavorable showing of the railway department was due largely to a sympathetic strike which led to a suspension of railway service for substantially a week.

The report of the general manager, included in the report to the stockholders, states that at the end of 1923 the regular schedule covered 37 different lines, requiring 448 cars on weekdays and 445 on Sundays. One new line was added and at the end of 1924 the regular schedule called for 480 cars on weekdays and 475 on Sundays. Passenger traffic was somewhat better than in 1923, when the gain was largely offset by the loss during the strikes in April and November. The increase in operating expenses was due partly to the increase in wages and salaries, and partly to excessive congestion of street traffic which interfered with the operations of the cars.

For the first time since 1917 considerable extensions of the railway line were built, divided between the central districts of the city, where the density of traffic had increased greatly, and new outlying residential districts that are being developed. The total amount of new single track added to the system in 1924 was 8.33 miles and the total length of single track reconstructed was 2.05 miles. Fifty new model passenger cars were built and put in service and four old type cars were reconstructed. The construction of 50 additional new cars was authorized, of which fifteen were begun.

Sale of South Bend Line Under Foreclosure Ordered

An order for the sale of the Chicago, Lake Shore & South Bend Railway, known as the South Shore lines, has been issued by Judge Thomas W. Slick of the United States District Court at South Bend, Ind. Floyd O. Jellison, South Bend, was named special master in chancery to conduct the sale. The judge approved an order prepared by attorneys for the railroad and the Cleveland Trust Company, trustee for the bondholders.

The plan proposed for the reorganization of the road provides for improving the property and turning the management over to Samuel Insull and associates. After the legal proceedings have been carried to a successful conclusion and a program is finally approved by the Public Service Commission the new company will work out a new plan which will include a change from the present alternating current electrification to direct current. A review of the basis on which the reorganization will be carried out was published in the ELECTRIC RAILWAY JOURNAL for Feb. 7, page 238.

Pass and One-Man Car Subjects Injected Into Baltimore Valuation

The subject of fare structure has been brought into a hearing to determine the valuation of the property of the United Railways & Electric Company, Baltimore. The Maryland Public Service Commission is devoting about three days each week to it. The hearing was resumed on May 19 and on May 21 was resumed until May 27.

When the hearing was resumed Clarence W. Miles, people's counsel, presented a petition to the commission asking that the railway be directed to show cause why it should not put into effect a $1 weekly pass good within the one-fare city-fare zone. It also was asked that the company be required to show cause why the one-man cars should be continued in operation. Furthermore, an intensive investigation into the complete rerouting of the lines was suggested.

Counsel for the railway objected to the petition on the ground that it had no place in the hearing to determine the valuation of the property. After taking the subject under consideration, however, the commission granted the petition in part. This was done after Mr. Miles filed an amended petition in which dates were eliminated. The commission directed that the United show cause why the $1 weekly ticket should not be issued and also that the testimony must be presented before the company concludes the presentation of its direct testimony in the valuation hearing. The company also was directed to show cause why the one-man cars should be continued in operation and to make studies of the rerouting. The subjects of one-man cars and rerouting, however, are not to be considered by the commission during the valuation hearing.

The fare petition took up a large part of the time of the hearing, but Adrian S. Hughes, Jr., said that the power-distributing equipment was in approximately 90 per cent perfect condition. John E. Zimmermann of Day & Zimmermann, contractors, Philadelphia, and Albert S. Richey of the Worcester Polytechnic Institute testified as to the condition of the company's tracks. Two methods were used by Mr. Zimmermann, he testified, one indicating that the tracks are in 81 per cent perfect condition and the other showing them to be in 84 per cent perfect condition. Mr. Richey considered the tracks to be in 85 per cent perfect condition.

Ardor for Municipal Ownership Dampened

The Canadian *Financial Post* says that the predicament of the radial lines running out of Hamilton, Ont., has had the natural effect of damping the ardor of municipal ownership enthusiasists. With these lines operating at a heavy loss, and the city system showing a falling off in receipts, there is not much encouragement either for the company to renew its existing franchise, or for the municipality to take over the responsibility, says this paper. The situation demands very earnest thought. To meet the new conditions there must be a readjustment.

The same authority says that the Hamilton Street Railway has not done well. Recently it was pointed out that the franchise would expire in 1927. Competition from the automobile, coupled with a generally depressed condition of business, made inroads on the traffic of the company, with the result that car earnings fell off materially.

Philadelphia Seeks Tax Refund

Efforts again will be made by the city to obtain from the federal government the refund of $5,000,000 paid by the Philadelphia Rapid Transit Company, Philadelphia, Pa., in income taxes since 1917. Senator Pepper, Mayor Kendrick, City Solicitor Gaffney and W. W. Atterbury, vice-president of the Pennsylvania Railroad, will make a personal appeal to Secretary Mellon of the Treasury to overrule the decision by the Internal Revenue Bureau against the refund.

Last November the federal government refused to refund to the company $5,000,000 of income and excess profits taxes which both the company and the city believe were erroneously paid. The first appeal was made by the company itself. Later the city joined in the action. The grounds set up were that a section of the former federal revenue act exempted from taxation any public utility in which a municipality or other political subdivision had an interest, such as the city had in the Philadelphia railway system by reason of the agreement of 1907.

STATISTICS OF OPERATION AT HAVANA

	1923	1924
Total number of passengers carried	114,292,880	114,872,616
Passenger car-miles	17,722,683	18,028,046
Passenger earnings	$5,714,644.00	$5,743,630.80
Passenger earnings per car-mile	$0.3224	$0.3186
Total earnings from operation	$5,864,904.00	$5,924,606.26
Total operating expenses	$3,728,344.94	$3,952,872.56
Total operating expenses per car-mile	$0.2103	$0.2192
Operating ratio	63.57%	66.72%
Net earnings from operation	$2,136,559.06	$1,971,733.70

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Final Offer from City for Rainier Valley Line

One million two hundred thousand dollars is the highest figure the City Council of Seattle, Wash., is willing to authorize for the purchase of the Seattle & Rainier Valley Railway. This is $125,000 less than the amount John C. Higgins, attorney for the bondholders, had advised the Council his clients would consider. The attorney's minimum figure. $1,325,000, was based on an assertion that this amount would be required to bring in all the outstanding bonds held by the Rainier Valley bondholders.

Accountants employed by the city say that the price of $1,200,000 is still too high. Isaac Comeaux, city accountant, says $955,000 would be sufficient to take up the outstanding bonds at their actual worth. He said the Rainier company recently sold $400,000 of bonds at 75 cents on the dollar. At this figure the bonds of the company would be worth $879,000 instead of $1,172,000. He said the fact that the city was negotiating for the purchase of the line would tend to raise the quotation for the bonds, but that instead of paying this increase the city, as the only purchaser in the market for the line, should buy the bonds at the value established for them by the recent sale of the $400,000 issue.

Another important finding was that the Rainier Valley citizens will expect the city to pave between the tracks if it purchases the line, an improvement the private company has long been financially unable to carry out. This will cost $500.000 to $750,000, and will add to the interest burden without increasing revenues.

Under the proposal of the city payment for the line will be made in 5 per cent twenty-year utility bonds payable in fifteen installments beginning the sixth year after issuance.

The city is influenced by a desire to obtain use of the Rainier line along Fourth Avenue from Stewart Street to the depot as part of the present municipal system to help relieve congestion on First, Second, Third and Fourth Avenues. If the present municipal line were operated on Fourth Avenue on a rental basis with tracks in the hands of the private company as owner it would cost the city from $30,000 to $50,000 a year in rentals.

The company has 60 days in which to advise the Council whether it will accept the offer. Further, it has been advised that the offer is final with the Council.

Saltair Railway Included in Sale

What is left of the famous Saltair resort, 15 miles west of Salt Lake City, almost totally destroyed by fire on April 22, has been offered to the city of Salt Lake by President Heber J. Grant of the Mormon Church. The offer includes the Salt Lake, Garfield & Western Railway, which operates between the city and the resort. If the city accepts the gift it will assume the bonds now outstanding for the electrification of the railroad. These bonds, in the amount of $267,000, mature serially until 1941. The church now holds a mortgage given by the amusement company, which has been operating the resort, but it is announced that this mortgage will be canceled by the holders in case the city accepts the offer. Should the city take over the property it would be with the idea of rebuilding the superstructure which was destroyed by the recent fire. It is estimated that a modern structure could be built for about $250,000.

The Mormon Church had already been offered $75,000 for the property, but this was rejected. No decision has been made as yet by the City Commission as to what action will be taken.

Bondholders Set Agreeable Price.—Mayor Kendrick of Philadelphia, Pa., recently submitted by message a communication concerning the Frankford Tacony & Holmesburg Street Railway reporting the result of a meeting of the bondholders on May 13. They agreed that if the bid for the system equaled $350,000 the bondholders would be amply protected and satisfied. The city is asked to buy in the line at the receivers' sale in June. As indicated previously in the ELECTRIC RAILWAY JOURNAL it is proposed to link it up with the Frankford "L" to reach the Tacony and Holmesburg sections, after the city spends about $450,000 in new equipment. The ordinance to acquire the line is pending in the committee on transportation and public utilities.

Seek Abandonment of Line.— The stockholders of the Binghamton Railway, Binghamton, N. Y., recently voted to request the Public Service Commission for permission to abandon a portion of the former line in Johnson City. A bus line now serves the major portion of this territory. Operation of the trolley was abandoned with the construction of the Ackley Avenue pavement.

Valuations Reduced. — Valuation of the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., which in 1924 stood at more than $8,000,000, was cut to $5,224,870 this year, and the $7,548,291 valuation of the Union Traction Company last year was reduced to $4,719,686 this year by the Indiana Tax Board on May 23.

Operating Income Increases. — The Pacific Gas & Electric Company, operating in Sacramento, Cal., reports to the Railroad Commission its 1924 railway operating revenue as $747,005 compared with $783,977 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $636,927 and for 1923 as $718,794, leaving net operating revenue of $110,078 for 1924 and $65,183 for 1923. During 1924 taxes charged to operation were $47,849 and for 1923 $50,130. Deducting the taxes leaves operating income of $62,229 for 1924 and $15,053 for 1923.

Gross Income Falls Off.—The Central California Traction Company, operating from Sacramento to Stockton in California, has reported its 1924 operating revenue as $592,798, compared with $615,856 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $507,744 and for 1923 as $495,367, leaving a net operating revenue of $85,053 for 1924 and $120,489 for 1923. During 1924 taxes charged to operation were $31,911 and for 1923 $33,920. Duducting the taxes leaves operating income of $33,142 for 1924 and $86,569 for 1923. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus of $73,969 for 1924 and $102,803 for 1923.

Denver Tramway Creditors to Get Stock.—According to an order issued by Federal Judge Robert E. Lewis, creditors of the Denver Tramway, Denver, Col., who file their claims with Ernest Stenger, receiver, before June 1 will be paid with preferred stock if the claims are filed, but claims unfiled on June 1 will be forever barred. It is estimated that $150,000 will cover the amount of the claims.

Net Income Lower.—For the ten-month period ended April 30, 1925, the Brooklyn City Railroad, Brooklyn, N. Y., had a passenger revenue of $9,415,702, against $9,743,958 for the ten-month period ended April 30, 1924. Operating expenses and taxes increased from $7,983,570 in the 1924 period to $8,124,-053 for a similar period ended April of this year. After the consideration of income deductions the net corporate income for the ten-month period ended April 30 of the present year was $1,216,666, against $1,662,086 for the ten-month period ended April 30, 1924.

Abandonment Issue Deferred. — A hearing was held by the Public Service Commission on May 26 on the petition of the Kingston Consolidated Railroad, Kingston, N. Y., for consent to abandon the part of its route known as the Colonial line, except for that part running to Kingston Point. After certain proof had been submitted by the company an adjournment was taken to June 5 at Albany. On behalf of the company it was contended that the Colonial line was operating at a large loss and that it constituted a severe drain on the resources of the company. It was claimed that the increases in fare allowed in the last few years had failed of their purpose in that they had not brought about the expected revenues. The company stated that it had an application pending before the Common Council to operate a bus line to serve the territory now served by the Colonial line and a large additional part of the city.

$220,355 Available for Charages.—The San Diego Electric Railway, San Diego, reports to the California Railroad Commission its 1924 operating revenue as $1,482,831 compared with $1,374,908 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $1,220,041 and for 1923 as $1,146,433, leaving net operating revenue of $262,-790 for 1924 and $228,474 for 1923. During 1924 taxes charged to operation were $100,492, and for 1923 $98,393. Deducting the taxes leaves operating income of $162,297 for 1924 and $130,-080 for 1923. Adding to the operating income, the non-operating income of the company results in a gross corporate income of $220,355 for 1924 and $167,-223 for 1923. This represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus.

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Personal Items

Messrs. Vaughan and Morley Owner-Managers

Sidney L. Vaughan and William K. Morley are two men sold on the idea that despite the inroads of buses and the growth of the use of the private automobile there is a good future for the interurban railroad intensively developed. What is more significant, they are prepared to back that faith with their dollars and so have just taken over the Grand Rapids, Grand Haven & Muskegon Railway, of which Mr. Vaughan has for some time been vice-president and general manager and of which Mr. Morley formerly was president. Mr. Vaughan will continue with the company in the capacity in which he has served for some time, but Mr. Morley returns to the property as president.

These two men have set for themselves a difficult task, but they are well qualified by training and previous experience to grapple with the problem. Not all the terms under which they took over the road have been made public, but this much is known: a $1,500,000 first mortgage bond issue matures on July 1, 1926. Left entirely to themselves in the handling of the road, the new owners expect by intensive merchandising methods so to re-establish the credit of the company that this obligation can be met.

It does not detract from the part that Mr. Morley will play as president of the road to say that it will be largely up to Mr. Vaughan. He has been actively in charge in the past and will continue as the directing head of the company. Mr. Vaughan is a so-called old-timer. By that is meant he started in at the telegraph key back in the "old days." But Mr. Vaughan knows that old-time railroading is nothing like present-day railroading. He has thought a lot about the matter, and now he is backing his judgment with his money and the money of his associates. He has long known what he would like to do. Now he is free to do it. To his new task as owner-manager Mr. Vaughan brings a wealth of transportation experience.

He learned telegraphy while working as baggage man and tie inspector for the Chicago & West Michigan Railroad, and learned it, he says, during his leisure hours. Not only this knowledge of telegraphy, but his tenacity and ability put him in the successive positions of telegraph operator at Fremont, agent at Holton, agent at Fremont and commercial agent of the Barry Line Steamers at Grand Rapids. All this happened between 1884 and 1902. After opening a city office for the company, he was promoted in 1903 to general freight and passenger agent of the company with offices in Chicago. There he remained until 1906, when he joined the Grand Rapids, Grand Haven & Muskegon Railway as general accountant. In the following year he was appointed traffic manager to look after the increasing passenger and freight business. In February, 1922, he was elected vice-president, and in June, 1922, were heaped upon him the added responsibilities attached to the post of general manager.

W. W. Holden Railway Chairman Southwestern Body

W. W. Holden, superintendent of the traction department of the San Antonio Public Service Company, was elected to the chairmanship of the railway section of the Southwestern Public Service Association at its convention held in Houston, Tex., May 5-8. In thus moving forward another step, Mr. Holden is following out successfully a career conceived at a surprisingly early age. Long before attending college he had decided that the coming electrification of steam railroads would make electric railway work a desirable field of endeavor, and consequently he shaped his education in this direction. He was graduated from the University of Texas after having completed the work of both electrical and civil engineering courses in four years.

W. W. Holden

During an apprentice period with the Westinghouse Electric & Manufacturing Company he made every effort to continue his training for electric railway work. At the end of that time he became electrical engineer and assistant superintendent in the construction of the interurban line from Dallas to Waco and Corsicana. Upon the completion of this construction work, in January, 1914, he entered the employ of the San Antonio Public Service Company, at that time the San Antonio Traction Company. Here he served as a motorman for a three months' training period. He was sent on an extended trip of inspection to look over the practices of various other properties, and upon returning assumed charge of the transportation department in San Antonio.

Mr. Holden was made a captain of engineers during the World War and served with the Sixth Engineers of the Third Division during the war and the occupation of Germany. He returned to San Antonio in May, 1919, and resumed his position as superintendent of transportation. Later he was placed in charge of equipment as well, with the title of superintendent of transportation and equipment. At the beginning of the present year he also took over the supervision of track, becoming general superintendent of the traction department.

Mr. Holden has been a consistent advocate of the use of the bus as an auxiliary de luxe at a rate of fare higher than that charged by the railway. His experience in handling this new transportation vehicle covers a period of more than two years. His conduct of the affairs of the railway in San Antonio has also been marked by the development of engineers in each department trained to administer the routine affairs of daily operation and to take over research work.

Fred E. Henderson, through a reorganization of departments of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., assumed the title and duties of purchasing agent of the company on May 1. Besides being in charge of all the supplies he will also superintend the warehouses, stores and equipment as well as the personnel of these departments. He will continue to act as superintendent of railways, taking over the duties of purchasing agent in addition to his work as head of the railway department. Mr. Henderson has been with the company since 1904, when he was made storekeeper. He was later promoted to general storekeeper, and on the resignation of John C. Cutler was made purchasing agent for the company. He relinquished those duties when the health of the late Otto F. Koss, superintendent of railways, failed and B. C. Adams, then vice-president and general manager, promoted him to succeed Mr. Koss.

W. C. Lancaster was recently appointed chief engineer of the New York Transit Commission. He succeeds the late John H. Madden. Mr. Lancaster is a consulting engineer with offices in New York City. He recently was in the employ of the Board of Estimate as electrical engineer in charge of the design for electrification and equipment of the proposed Staten Island tunnel.

William H. Lines, construction engineer for the Portland Electric Power Company, Portland, Ore., has been appointed assistant to Franklin T. Griffith, president of the company, effective May 15. Mr. Lines joined the organization in 1912 and remained for five years, at which time he resigned to enter private business. In 1923 he returned to the Portland Electric Power Company and has remained in the capacity of construction engineer.

Frank D. True, Portland, Me., vice-president of the Cumberland County Power & Light Company, Portland, Me., and a director of the Androscoggin & Kennebec Railway, was recently elected a director of the Boston & Maine Railroad to succeed Judge Norman L. Bassett, Augusta, Me.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Recognized Types of Paving Brick Reduced

From 66 to four recognized types and sizes of vitrified paving brick is the simplification record of the paving brick industry in the short period of four years, according to announcement just made by the permanent committee on simplification of varieties and standards of vitrified paving brick of the United States Department of Commerce. At the meeting of the committee, held March 20, at Washington, D. C., one of the five remaining types and sizes of brick was eliminated, thus cutting down the officially recognized list to four in number.

The recognized types and sizes follow:

	Depth		Width (As usually laid)		Length
Plain wire-cut brick (Vertical Fiber Lugless)	3	x	4	x	8½
	3½	x	4	x	8½
Wire-cut brick (Dunn)	4	x	3½	x	8½
Repressed lug brick..	4	x	3½	x	8½

The variety eliminated by the committee after a thorough study of the shipments for the entire industry for the year 1924 was the 3-in.x3½-in.x8½-in. (Dunn) wire cut-lug brick. This particular variety had shown a consistent decline until it represented only 2 per cent of the total shipments in 1924.

Of the total 1924 shipments, 82.1 per cent were in the four types and sizes now recognized by the committee. The most marked growth of any special variety outside of the recognized list was that of the 2½-in.x4-in.x8½-in. vertical fiber (plain wire cut) brick. This size and type of brick increased from 2.2 per cent of total shipments in 1922 to 4.4 per cent of shipments in 1924. Reports from manufacturers indicated a decided trend toward a thinner brick for paving streets and highways of light or medium traffic.

Record Trade Year for the United States

American export trade, which has been steadily increasing since 1921, continued its upward course in 1924 with a gain of 10.2 per cent over the previous year. Last year the value of exports was $4,591,000,000. This is a figure even higher than that for 1921, a year in which the post-war values still influenced foreign trade figures. The increase over 1923 was $423,000,000.

It is shown that in 1923 the value of exports was only 10 per cent greater than that of imports, but in 1924 exports outdistanced imports by 27 per cent, the favorable balance of trade in 1924 being $980,000,000, or more than 2½ times the 1923 balance. With an excess of imports of gold and silver of $222,000,000, our visible favorable balance of trade, which includes both merchandise and gold and silver, was $758,000,000.

Seven countries—Great Britain, Canada, Germany, France, Japan, Cuba, and Italy—purchased nearly two-thirds of American exports in 1924, nearly $3,000,000,000 worth, according to an analysis of the world trade of the United States published by the Foreign Commerce Department of the Chamber of Commerce of the United States. These seven countries in recent years have invariably been found among the country's ten leading customers, with the single exception of Germany from 1915 through 1919. In 1924 35 countries each purchased more than $10,000,000 worth of American merchandise—96 per cent of all shipped abroad—the 80-odd markets in the rest of the world taking only 4 per cent of America's total exports.

A few import records also were made in 1924. A greater amount of standard newsprint paper, 2,714,000,000 lb., at the highest value, $101,000,000, was imported in 1924 than in any other year. The quantity was about 4 per cent greater and the value 3 per cent higher than the previous record imports of 1923.

Exhibit Space at A.E.R.A. to Be Assigned in July

Requests for space at the exhibit to be held in connection with the American Electric Railway Association convention in Atlantic City in October must be filed by June 30. Initial space assignments will be made early in July. Application forms for space are now being sent out. Whether or not intending exhibitors receive applications, it is suggested that they communicate promptly with the Association. Elsewhere in this issue F. C. J. Dell, director of exhibits of the association, explains the arrangements at greater length.

Rolling Stock

Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., is remodeling two interurban cars, at South Bend, for use on the Goshen-South Bend division. The remodeling includes the removing of the present type of seats and the installation of chairs, the laying of a heavy carpet on the floor and the removing of the wood partition between the baggage compartment and the rest of the car and putting in glass so that a clear view of the track ahead may be had by passengers. A dome-lighting system will be used with individual lights at each seat. The exterior of the car will be painted orange, with black trimmings and crimson or dark red under the window sash. The cash and ticket register will be removed, and the stove installed in the rear of the car. When completed, which will be in three weeks, the cars will be put in operation between South Bend and Goshen.

Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, recently purchased two additional Mack buses of the city type with seating capacity for 29.

Trade Notes

S. F. Fannon, industrial engineer with Sherman Service, Inc., New York, is planning to expand the scope of his industrial work by giving talks on worker co-operation to employees. The purpose of these talks will be to explain to employees the problems of their employers. A pamphlet, lately published by Sherman Service, describes the scope of these talks. For several years Mr. Fannon has been a popular speaker on industrial co-operation at meetings of various business organizations and associations. He delivered an address "A New Conception of the Job" at the meeting of the New England Street Railway Club on Dec. 4, 1924.

Beckwith-Chandler Company, Newark, N. J., has appointed J. Alex Wilson sales manager. Mr. Wilson was formerly in charge of the pyroxylin development of the company, which manufactures paints and varnishes.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued folder No. 25 on electric flashing beacons and electric traffic signals.

Walter A. Zelnicker Supply Company, St. Louis, Mo., dealers in rails and equipment, has issued bulletins Nos. 332, 333 and 334, describing contractors' equipment.

General Electric Company, Schenectady, N. Y., has recently issued a résumé of the uses and value of automatic arc welding, together with a description of the welding apparatus and generating equipment used, in a bulletin bearing the number 48937.1 and entitled "Automatic Arc Welding." It is a 20-page, paper-bound booklet.

Rome Wire Company, Rome, N. Y., has completed its magnet wire handbook containing a complete set of tables and information concerning magnet wire, especially adapted for engineering use.

Metal, Coal and Material Prices

Metals—New York	May 26, 1925
Copper, electrolytic, cents per lb.	13.612
Copper wire base, cents per lb.	15.875
Lead, cents per lb.	8.35
Zinc, cents per lb.	7.47
Tin, Straits, cents per lb.	56.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.175
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0.1575
Turpentine (bbl. lots), N. Y., per gal.	$1.07

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Wasted Government a National Menace

GOVERNMENT activities have increased greatly in the past few years. The tendency toward the injection of government in business which became general during the war has not been checked up to the present time. The able presentation of the forms of waste in government which was made by Secretary Hoover at the recent meeting of the United States Chamber of Commerce and which was abstracted in the issue of ELECTRIC RAILWAY JOURNAL for May 23, page 820, shows how far the federal government alone has gone afield in finding new activities in which to expand its efforts. Bureaus and commissions have been formed for this and that object, and the functions of existing agencies have been expanded so that all sorts of activities foreign to the original purposes of government have become a matter of course. The exposition of the subject by Mr. Hoover covered only the federal government. Every state, every city and many of the counties have likewise expanded their functions so that they too have had a similar drift from the narrow line of governmental activity.

It is high time that the swing of the pendulum be reversed. That this will be a difficult thing to bring about was indicated clearly by Mr. Hoover. It will take the combined efforts of all responsible elements in every community working together for the common cause to produce tangible results. Here is one of the great functions of the chamber in which it can be of immense value to business in general. There is no body which is so well equipped to handle a problem of this kind and no group of men so representative of the rank and file of American business as is this one. No one element in the fabric of the country will get more good out of the discussion and any results that may come from it than will the electric railways. They have been badgered by politicians, restricted in their methods of operation and financing and almost strangled with respect to fares, largely by the injection of these extraneous elements into the original function of government. For this reason every management should welcome the opportunity offered to work toward the end of a restriction of these extra governmental functions.

Spartanburg Votes to Retain Its Street Cars

JUST what is the philosophy of the people of Spartanburg, S. C., who recently refused by a two to one vote to allow the local utilities company to amend its original franchise by elimination of the clause which required the operation of street cars within the city limits? The ordinance drafted by the City Council provided that the South Carolina Gas & Electric Company be relieved of the necessity of operating street cars on condition that it remove its tracks and bear the expense of restoring the street paving. In addition the traction company was to have provided a bus transportation system.

The street car tracks have been practically in disuse for two years with the exception of one railway line. Buses have been in operation and have been giving a fairly dependable service. To all outward appearances it looked as if the bus had saved the situation and that the new management with its proposals for bus extensions had solved a problem which dates back to December, 1922, when the company abandoned several lines on the ground that they were unprofitable. Following the abandonment were discussion, disagreement and seemingly endless litigation in which the City Council, the Railroad Commission and the Supreme Court took prominent parts. Finally, in the fall of last year a new management took over the task of supplying 25,000 people with transportation service in which the bus was the principal vehicle. The controversy was over and a new era seemed to be dawning. But with the opportunity given by the City Council to the people to decide on street cars or buses because of the necessary rehabilitation program, the street car, almost a relic of the past as regards that city, came into its own again.

The reason for this attitude is not entirely obvious. Probably the public was not opposed to the new régime nor antagonistic to the methods employed. But when the issue meant tearing up the tracks the people saw the extinction of what had been an important factor in the growth of their city and they refused to sign its death warrant. They forgot the tribulations of the past few years caused by the non-functioning of these same vehicles and only remembered their pristine usefulness.

Less Unsprung Weight a Development of Importance

UNSPRUNG weight of electric railway equipment is a factor of major importance in track life and maintenance. This was emphasized by R. H. Findley of Omaha in a paper before the Mid-West Electric Railway Association, abstracted elsewhere in this issue. Unquestionably the time has arrived for careful consideration of this subject. Not only from the standpoint of track construction and maintenance costs is it important. Only when the present excessive unsprung weights which are carried on the rail are materially lowered will the problem of noise reduction be solved.

Much progress has been made already in the reduction of the total weight of electric railway equipment, and further strides in this direction may be expected. Both on city and interurban cars the universal use of lighter equipment will undoubtedly permit substantial savings both in first cost and maintenance of track. But by supporting on springs a large part of the weight which at present delivers direct hammer blows to the rail the possible savings would be materially greater than any which could reasonably be expected by mere reduction in total weight of equipment.

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Furthermore it is hard to conceive of really noiseless car operation in city streets without the general use of much more flexible roadbeds than have been possible heretofore. To build track of that type, however, which will stand up reasonably under traffic it is imperative that a much larger part of the total car weight be supported on springs.

Methods by which this development will be accomplished are hard to foresee. Some thought has been given to the possibility of taking the car motors off the axles and driving through some arrangement of bevel or worm gearing, perhaps along the lines of automotive practice. When the present axle suspension and spur gear drive were adopted the design and manufacture of gearing were crude. Automotive requirements have been responsible for a remarkable improvement. The present type of railway motor drive is so simple and reliable that there is a natural reluctance to consider seriously any complication which might increase cost. However, the demand for improvement is now becoming so insistent that some form of drive to take the unsprung weight off the car axles may be expected to attract increasing attention.

Cushioning for wheels presents another possibility. This may in itself help reduce the hammer blows on the rail. Some interesting experiments in this direction are being made, From both standpoints—track cost and noise reduction—lessening of unsprung weight demands attention from manufacturers.

Mayor Hylan's Own Board Pricks Five-Cent Fare Bubble

MAYOR HYLAN'S hand-picked Board of Transportation in a report made on May 28 buried his 5-cent fare issue under a weight of evidence heavy enough to inter permanently any seeker for office on the Mayor's policies except the Mayor himself. It may be that this time he is finished, too, but no one seems to be sure about it, though every paper in New York except the Hearst sheets expresses that hope. Certainly if figures could bury a man those contained in the report just made public bury the Mayor face down.

The system on which the Mayor has set his heart would have a length of 57 route-miles, providing single-track mileage of 170 miles, not including sidings. Without any equivocation the Mayor's board says that the continuance of the 5-cent fare depends absolutely upon the method of financing. Financing entirely with 50-year bonds would necessitate an 8-cent fare plan, whether the system be operated by the city or by a corporation.

These are plain words, but they are the words of the board itself. Moreover, the board says that on a capital outlay of $542,915,000 under the 5-cent fare plan the capital could be obtained only by putting on the users not more than 40 per cent of the original cost. This would be taken care of by the issue of 50-year bonds, the interest and sinking fund of which would be paid out of earnings. Of the remaining 60 per cent of the original investment, 35 per cent would be contributed by the city at large and would be raised by the sale of short-term serial bonds retired in annual installments during the next eight years. The report declares that this can be done without any increase in the tax rate. Finally, 25 per cent would be paid by the owners of property directly benefited by the improvement. In short, the board outlines a financial policy that, if adopted, will preserve a uniform 5-cent rate of fare by distributing the cost of the new rapid transit facilities "equitably upon the beneficiaries thereof."

It is all very cute, but the beneficiaries show signs of rebelling. The 5-cent fare may appeal to them in the abstract, but the prospects of a yearly visit from the tax gatherer in addition to the one he now makes does not appeal to them. Their spokesmen are up in arms. Moreover, there is grave doubt as to whether such assessments could be made so equitably as to be constitutional.

Electric Power Securities a Favorite Form of Investment

THE good market at present for the stock and other junior securities of electric power companies has incited some of the financial papers to publish striking comparisons of the prices for these securities in 1921 and at present. The figures show a very large rise in many cases, but this fact alone is no proof that the increase is unjustified. While some of the stock may seem high on the basis of present earnings, that of other companies is undoubtedly low, according to the same standard.

It is not surprising that at the present time there should be a demand for electrical stock. This country is in an electrical age. The uses of electrical power have been tremendously stimulated during the last ten years by the rise in wages during the same period. It is not only in the factory that appliances by which one person can do the work of two or three are being used. These improvements are sought also in the business office, on the farm and in the home. In each place the demand is due to the high cost of manual labor. Added to this, of course, is the higher scale of living at present and the greater purchasing power of the American people. Both of these reasons have stimulated the demand for more illumination and for all kinds of electrical appliances which add to the comfort of living.

Another factor in the increased demand for electric power securities is the growing recognition by the public and by courts of the necessity of fair rates for public servants. Still other factors are the engineering improvements and financial consolidations which have enabled these companies to serve an ever-increasing number of customers. During the war expansion to take care of this demand was difficult. Since 1918 the return to normal conditions in this respect has brought about a large expansion in utility enterprises.

The electric railway man naturally is interested in the effect of this situation on electric railway development. As a part of the electrical industry, electric railways must share to some extent in this growing popularity for electrical securities. One reason, of course, is that a great many of the electric railways also do a power business. Another is that much of the pioneer work in securing adjudication on franchise and rate questions will be undertaken by the power companies and its value will inure to the electric railways. Still another reason is that the engineering improvements stimulated by this expansion of the electric power industry should tend to reduce the cost of energy to railway companies which purchase power.

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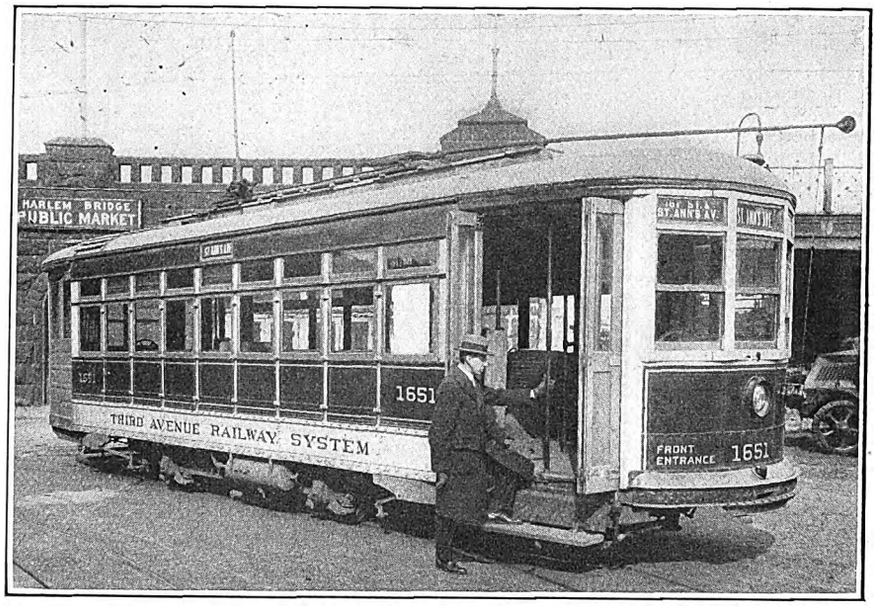
25,300-Lb. Single-Truck Car Seats 46

One-Man Car Built for Third Avenue Railway Has Many Distinctive Features, Including Long Wheelbase Truck, Removable Side Panels and Outside Brake Rigging —Simplified Framing Is a Major Factor in the Reduction of Weight

HIGH seating capacity combined with light weight are features of a new single-truck one-man car that recently has been built for the Third Avenue Railway, New York City. This car is of the full convertible type with removable side panels that has been used successfully for some years by this company. Seating 46 passengers, it has a length over all of 35 ft. 2½ in. and a truck wheelbase of 9 ft. 6 in. Completely equipped its weight is 25,300 lb. Other features of interest are the outside brake rigging and the flush platform design.

Included in the car order, which was awarded to the J. G. Brill Company, Philadelphia, were 49 convertible motor cars with bodies 30 ft. 4½ in. long and a single convertible car body, which is the one described, 35 ft. 2½ in. long. The construction of the latter was the same except for the extended length.



This Light-Weight Car of the Third Avenue Railway, New York City, Has a Low Step and Flush Platforms. The Side Panels Are Removable

All the car bodies were of a convertible type, the side opening being arranged so that the panels can be taken out in summer and screens substituted. The round-end vestibules have folding doors and steps at diagonal right-hand corners of the car body. The roof is of the plain arch type. An interesting feature of the longer car is the remodeling of a Brill 79-E truck so as to give a 9-ft. 6-in. wheelbase. Rolled steel wheels of 24 in. diameter are used. The weight of this car is 25,300 lb. and the seating capacity 46. This gives a weight per seat of 550 lb., which is from 75 lb. to 250 lb. less than many recent cars ordered for city service.

Framing Substantial But Light

The underframing is of steel throughout. Side sills consist of 3-in. by 3-in. by $\frac{5}{16}$-in. rolled-steel angles running continuously between the end sills. The latter, which are 4 in., 5.4-lb. steel channels, extend the full width of the car between the side sill angles to which they are securely riveted. Steel channels of the same weight are used for crossings, but they have a 2-in. by 1½-in. wood furring on the sides. Where double crossings are used at the end of elliptic springs, there is a 1-in. by 2-in. wood furring. One crossing is located directly in the center of the car body and one either side of the center, a distance of 2 ft. 11 in. from the back of the crossing. Two 4-in. rolled-steel channels are placed back to back and spaced 1 in. apart at 6 ft. 3⅞ in. from the center of the car to the center of the two crossings. This eliminates the crossings and angle wheel piece stringers used in other cars now operated by the railway.

The outside platform knees are of 7-in. 9.8-lb. channels, and diagonal braces extend from the fender to the end sill. These are of 3-in. by 3-in. by $\frac{5}{16}$-in. rolled-steel angles. Diagonal tie straps are of 2-in. by ¼-in. bars. Bumpers consist of 4-in. rolled-steel channels with their flanges turned outwardly. A section of 3-in. channel is riveted directly under the bumpers at the center, so as to form an anti-climber. A casting is installed back of this channel to receive the railway's standard drop pin.

The corner posts are of 3-in. by 3-in. by $\frac{5}{16}$-in. rolled-steel angles, and side posts are steel tees 3 in. x 1½ in. by ¼ in. These extend in one continuous piece between side-sill angles forming carlines. They are riveted at both ends. The side posts are equipped with malleable-iron brackets for fastening the removable side panels or side screens, depending on whether the car is open or inclosed.

The top window support consists of a 1½-in. by 1½-in. by $\frac{5}{16}$-in. rolled-steel tee riveted outside the posts and extending the full length of the body. The belt is a 2-in. by ⅜-in. flat steel bar. Letter-panel angles are ¾ in by ¾ in. by ⅛ in. The letter panels extend 18 in. above the upper sash. The removable side panels are straight. The two end side panels consist of No. 16 blue annealed sheet steel and are not removable. The side sheathing is of ⅛-in. blue annealed steel.

The ends of the car are inclosed with round-end vestibules having three windows. These have a $\frac{5}{16}$-in. agasote lining bent to radius. Vestibule center posts and belt rail are of ash. The corner posts are 2-in. by 2-in. by ⅛-in. rolled steel angles with an ash filler. Vestibule windows have bottom sash stationary and the upper arranged to drop. The upper sash are fitted with a rack and lock the same as the side sash in the car

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body, so that they may be held at various heights. All sash are of ash glazed with double thickness glass and fitted with sash lifts. The left-hand side of the vestibule is inclosed with two fixed panels.

CONTINUOUS POSTS SUPPORT ARCH-TYPE ROOF

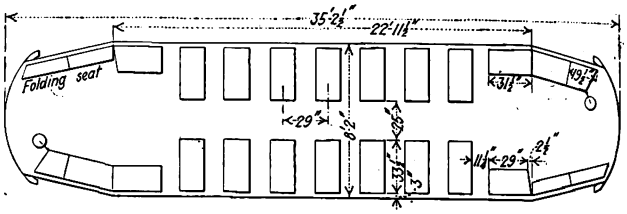
The roof is of the plain arch type and is continuous for the full length of the car body. It is made of ⅜-in. agasote with wooden hoods. A covering of No. 8 canvas bedded in white lead is used. The roof is supported by the side post tees which form the carlines. The sides are of No. 16 sheet steel with flanges at both top and bottom. The bottom flange is secured to the roof and the top flange to the monitor board, which is ¾ in. thick.

A 1⅛-in. yellow pine trolley board is installed on the roof above the ¾-in. monitor board, to receive two trolley bases. The monitor board serves as the top for a ventilating duct extending the full length. The duct sides are No. 16 sheet steel flanged at both top and bottom. The bottom flange is fastened to the roof and the top flange to the monitor board. Roof mats and motormen's steps are provided at diagonal corners of the car. Bulkheads are omitted, but the continuous bulkhead angle at either end is 3 in. by 3 in. by ⅜ in.

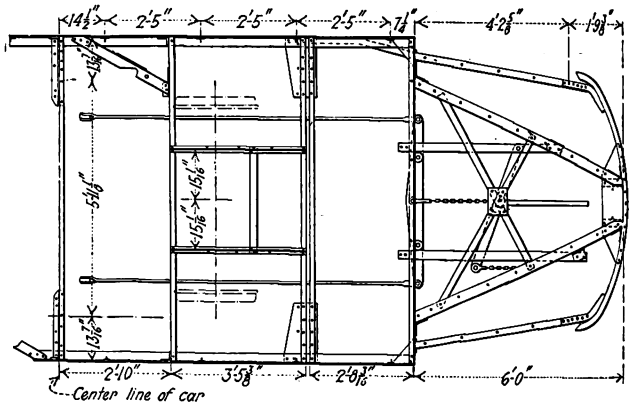
The flooring in the body and platform consists of one layer of ¾-in. yellow pine tongued and grooved. This is laid lengthwise in the body and crosswise on the platform. Floor strips are laid lengthwise in the aisle and crosswise between transverse seats. The aisle floor mat strips are of tapered maple ⅝ in. wide at the bottom and ¾ in. high. The floor strips between seats are ½ in. high. The inside finish, including all doors, sash and molding, is of ash. The ceilings have carline finish. Advertising card racks are provided on each side of the body.

The lower portions of the removable side panels are of ⅛-in. agasote, while the upper portions are double thickness glass, the two being set into wooden frames. The long car has seven of these removable panels and two permanent end panels of similar design. The short car has two less removable panels. The screens which are installed in place of the side panels during the summer months are of diamond mesh wire. These are arranged to be applied with the same brackets as the side panels. The upper sash, which remain in the car, are fitted with sash fixtures and are arranged to raise. The company's standard sash lock is used on the side sash. Sash racks are pressed steel with notches.

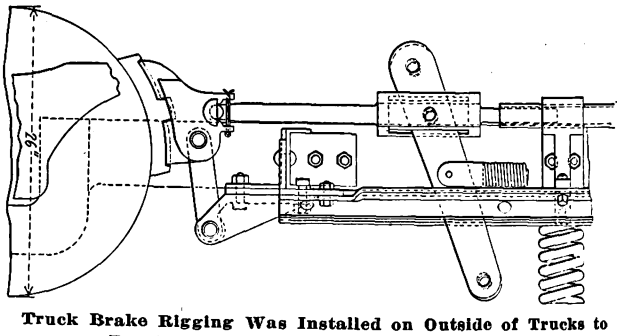
The 46-seat car has seven Brill Winner transverse seats with reversible backs on each side. The shorter cars, which seat 38, have but five cross seats. The seats have pressed-steel pedestals and the seat backs are provided with polished bronze grab handles arranged diagonally on the backs. All seats and backs are made of ash, wooden slat construction. The transverse seat panels and backs are made as light as is consistent with strength. Clips are installed on the bottom of transverse seats to prevent them from being raised from position when the passenger rises.



The Car Has a 25-In. Aisle with 33½-In. Seats. The Total Seating Capacity Is 46



Body Underframing Was Lightened by Strengthening the Main Members and Omitting Unnecessary Parts



Truck Brake Rigging Was Installed on Outside of Trucks to Provide Space in Center for Installation of Electrical Equipment

There is a longitudinal seat for two persons at each corner of the interior and on the diagonal left-hand corners of the platform. The seats on the platform extend to the dasher. A folding slat seat on each platform in front of the door opening is arranged to fold up against the car body.

The motorman's seat at each end of the car is similar to the Brill swing type, but is made much lighter. Corrugations at the bottom of the stancheon permit the

EQUIPMENT FOR FULL CONVERTIBLE CAR OF THIRD AVENUE RAILWAY

Builder of car body	J. G. Brill Co.
Type of car	Full convertible
Seating capacity	46
Weight, total	25,300 lb.
Length over all	35 ft. 2½ in.
Truck wheelbase	9 ft. 6 in.
Width over all	8 ft. 2 in.
Body	All steel
Interior trim	Ash
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse (foot control)
Armature bearings	Bronze
Axles	3½ in.
Bumpers	Channels, flange outside
Car signal system	Consolidated
Car trimmings	Brill
Control	K-11
Curtain fixtures	Curtain Supply Co., Ring 88
Curtain material	Pantasote
Destination signs	Hunter
Door-operating mechanism	National Pneumatic Co.
Fare boxes	Johnson
Wheelguards	Providence (all metal)
Gears and pinions	Westinghouse gear, Cincinnati pinion
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Dayton 8 in.
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	G. E. aluminum
Motors	Two GE-247, inside hung
Paint	Chas. Moser & Co.
Registers	International Type R
Sanders	Brill Dumpit
Sash fixtures	Edwards
Seats	Brill Winner
Seating material	Ash slats
Springs	Brill
Step treads	Kass safety
Trolley catchers	Earll No. 7
Trolley base	Nuttall Type 11, Form A
Trolley wheels	G.E., Form A-40
Trucks	Brill 70-E-2
Ventilators	Consolidated honeycomb
Wheels	26 in., solid steel

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seat brackets to be rotated and then held in any desired position. This provides for a changeable distance between the dasher and center of the motorman's seat.

Each side window has a pantasote curtain mounted on Rex all-metal curtain rollers. A bathtub type motorman's curtain of khaki duck is placed on each platform. This is supported on a pipe hanger. A wooden box arranged on the frieze board at the left-hand corner of the vestibule holds the curtain when it is not in use.

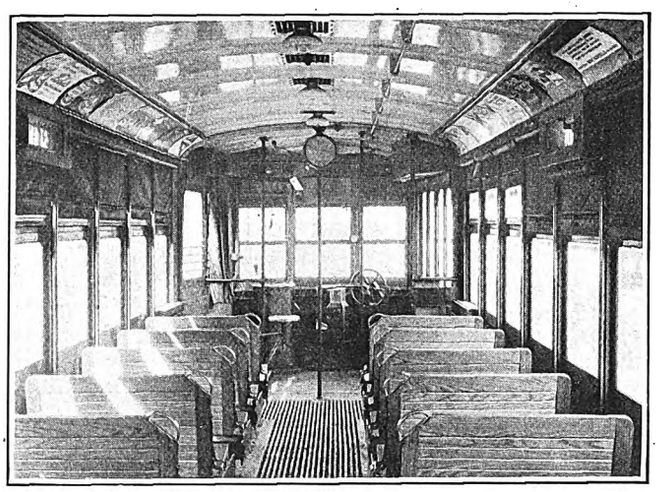
Double two-part folding doors are provided at diagonal right-hand corners of the car. One part is arranged to fold out against the body corner post, and the other to fold out against the vestibule corner posts, giving a clear opening of 4 ft. Doors are of ash, glazed in the upper portion with double thickness glass, while the lower portion is provided with agasote panels. The single folding step is the full width of the door opening. This is of 1¼-in. oak and is arranged to operate in conjunction with the folding doors by a National Pneumatic engine, located in the heading above. Each step is fitted with a 3-in. Kass safety tread.

There is a stanchion in the center and another at the right of each door opening. Additional stanchions with horizontal legs are placed at the right-hand side of the bulkhead and the left-hand side of the platform, and one with a railing reaching from the center of the bulkhead to the door opening separates incoming and outgoing passengers. All stanchions are 1-in. diameter pipe with malleable-iron fittings, enameled black. A chain with catch between the two stanchions at the center of the door opening slides into the stanchion when not in use. A drop bar is located at each doorway to slide on a vertical stanchion of the railway company's standard.

Special Trucks Were Designed

The truck construction for the longer car is of particular interest. The short car bodies are mounted on Brill No. 79-E1 trucks with 8-ft. wheelbase. For the long car this was remodeled so as to provide a 9-ft. 6-in. wheelbase with 24-in. wheels. The brake rigging is placed at the outside of the truck. This gives a space underneath for equipment approximately 4 ft. square. This simplifies the inspection of equipment. The springs of the longer truck are of heavier construction than those used with the short car bodies.

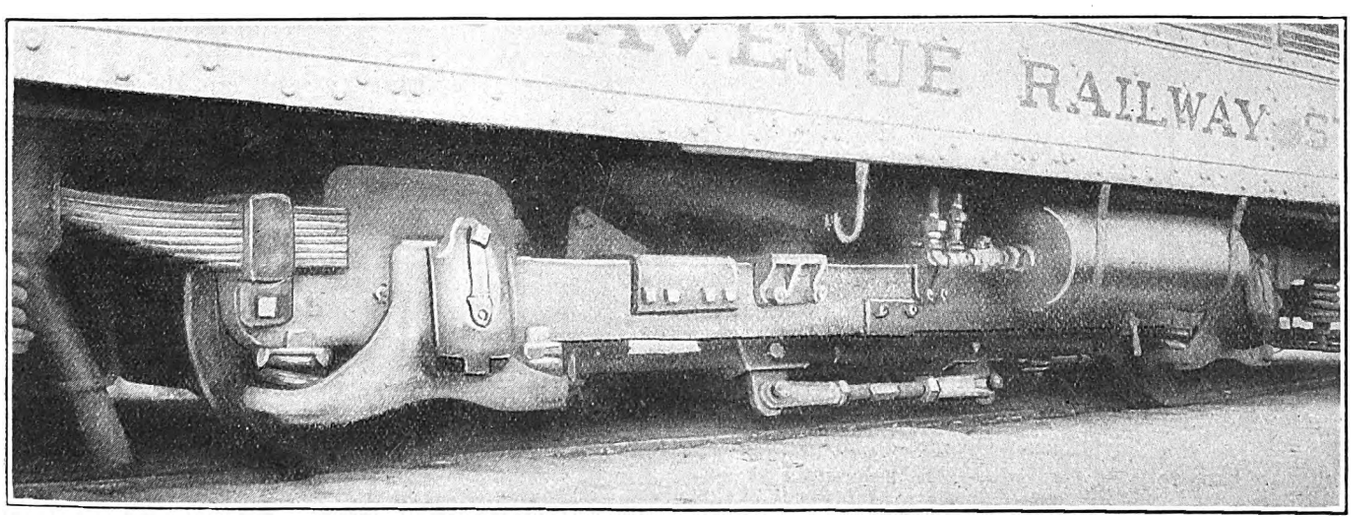
The type of equipment, dimensions and weight are given in an accompanying table. The passenger signal



Lamps Are Installed on the Ventilators and the Wiring Is in the Ventilating Duct Above the Roof

system consists of a Consolidated Car Heating Company's buzzer located on the underside of the hood at each end of the car, with a push button on each corner post. Exhaust type ventilators are used with grilles. Five of these are arranged to take light fixtures. Six Hunter destination and route signs are used on each car. One is located over each right-hand vestibule window, one over each center vestibule window, and one over each center side sash. The two signs in each end of the car are arranged for curtains 19 in. wide and the side signs for 25-in. curtains. The side sign boxes are illuminated from the car body lights and have a removable frame on the back in place of a hinged lid. By removing the frame, the curtain and mechanism can be entirely removed from the sign boxes.

Each car is provided with two Brill "Dumpit" lever-operated sand boxes complete with sand hose. The sand boxes are of galvanized iron and are located under seats at diagonal corners of the car. The lever for operating the sanders is close to the controller, so as to permit the installation of a stationary seat on the left-hand side. The electrical equipment consists of two GE-247 motors, inside hung. K-11 controllers are used, together with pedal type control interconnected with the air brakes. An alarm gong on the roof above each platform is arranged to be operated from the motorman's position by means of a hand cord.



The Truck with 9-Ft. 6-In. Wheelbase Is Arranged with the Brake Rigging Outside to Give Clearance for Equipment Beneath

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Special Overhead During Grade Elimination

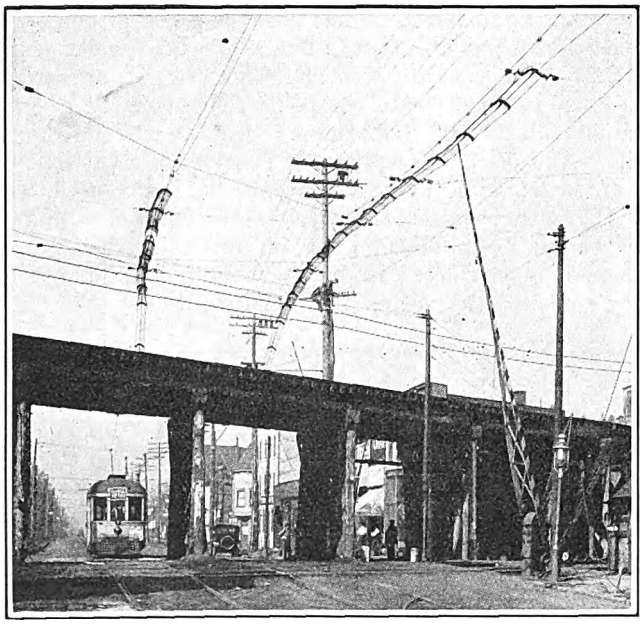
A Drop in the Trolley Wire from 22 Ft. to 15 Ft. Was Necessary on One of the Cleveland Railway Company's Lines in a Space of 6 Ft.

BY JAMES SCOTT
Superintendent of Overhead Construction Cleveland Railway, Cleveland, Ohio

GRADE-CROSSING elimination work of the Pennsylvania Railroad confronted the Cleveland Railway with an unusual problem during the past year. There were three of these crossings eliminated on the trolley lines at Woodland, Qunicy and Central Avenues. The surface railroad lines at these points originally consisted of four tracks, but during the reconstruction all steam traffic was operated over two tracks, while a trestle was constructed over the other two. The construction of trestles, the elevating of switches and spurs extended over a period of more than ten months. During this time, special overhead construction was necessary on the electric lines, which were kept in continual operation.

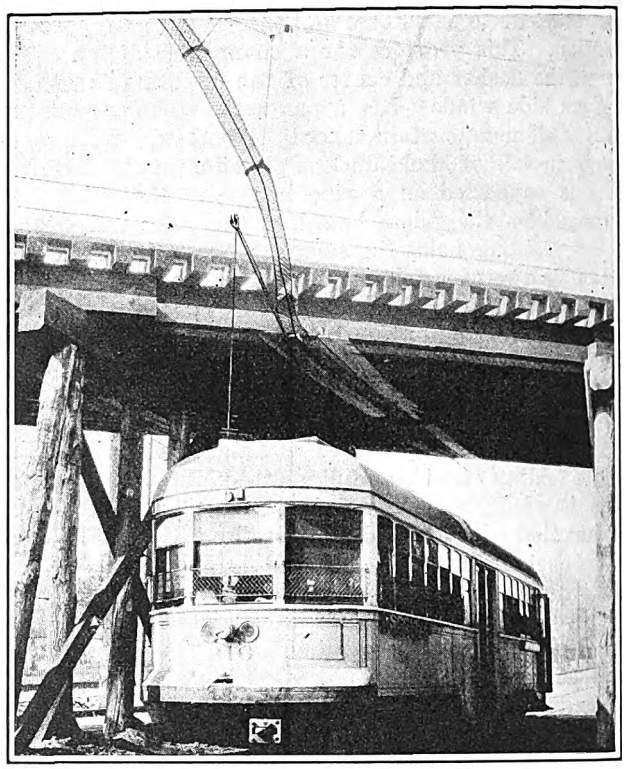
The method of reconstruction used made it necessary for the railway to maintain the trolley wire and guard at a height of 22 ft. over the two tracks which were in use for steam road traffic and then to drop to a height of about 15 ft. in order to pass under the trestle. This was particularly difficult as the trestle was but 6 ft. west of the steam line tracks. The construction used is shown in the accompanying illustrations.

One of the most difficult problems that had to be solved was to provide for the action of the trolley



Type of Overhead Construction While Temporary Trestle Was Being Used for Grade Elimination

wheel and pole while a car passed under the construction in the direction from the steam road track toward the trestle. Due to the sharp drop of the overhead and the close proximity of the trestle, the pole came in contact with the bridge before the wheel started down the incline of the trolley wire. It was, of course, most desirable to have such a construction that the wheel would not leave the wire and also so that it would not be necessary to stop the car while the conductor pulled the trolley pole down.



The Trolley Pole of Electric Cars Passing Underneath the Trestle Made Contact with a Bronze Pan, and the Trolley Wheel Was Directed Back Onto the Wire by a V Construction

Careful consideration of the problem showed that while it was not possible to prevent the trolley wheel from leaving the wire, it was possible to arrange a construction so that the wheel would be automatically replaced on the wire and at the same time keep the circuit from being broken. A bronze bridge approach pan was placed on the trestle so as to extend a few inches beyond the edge of the trough. This provided clearance for the trolley wire and pole. As the pan had a beveled edge, a roller effect was given when the pole made contact. The bridge pan was V-shaped with sides 1½ in. deep and an opening at the apex where the switch approach led onto the trolley wire. The wire was supported through the trough by means of barn hangers and was led through a groove on the top of the pan and then out by means of an ordinary switch approach.

When the trolley wheels passed from the high to the low section of the wire they followed the wire until the pole made contact with the pan. The wheels were then forced away from the wire as the car proceeded and operating current was fed through the bronze pan to the pole. As the car proceeded the pole slid along the pan until the wheel came in contact and was then directed through the V onto the trolley wire. This provided a continuous circuit for current collection and no trouble from dewirement was experienced.

Root Lifeguard Used at Grand Rapids

IN THE specifications of the Grand Rapids car built by the St. Louis Car Company, published in ELECTRIC RAILWAY JOURNAL for May 23, page 808, the lifeguards were incorrectly listed as being H. B. type. This should have been the Root all-spring steel lifeguard.

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Stray Earth Currents Increased by Salt

Use of Common Salt at an Electric Railway Junction to Prevent Freezing of Track Switches so Lowered the Resistance of the Soil in the Vicinity as to Cause the Rapid Destruction of Adjacent Water and Gas Pipes by Stray Currents

By Charles F. Meyerherm
President and Engineer Albert F. Ganz, Inc., New York City

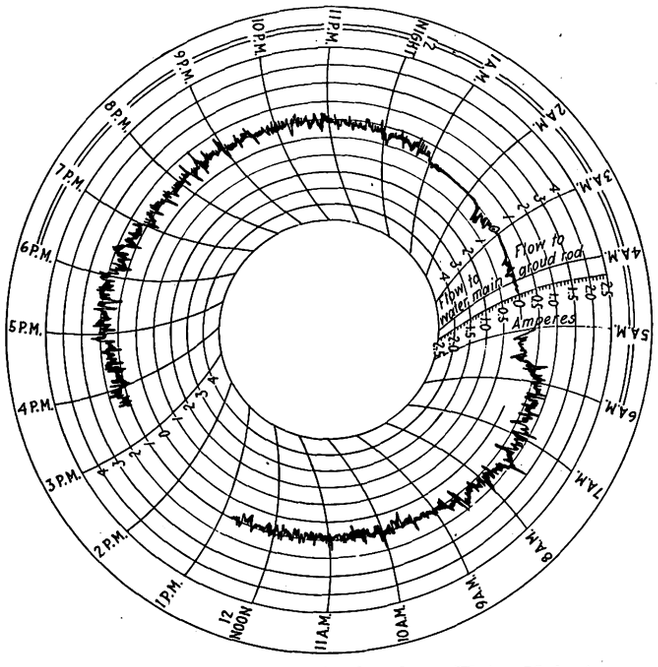
PREVENTION of freezing of track switches by the use of common salt is a practice of many electric railways. The salt is sprinkled on the rails and about them, usually when there is snow or ice on the ground. As the snow melts the salt goes into solution and permeates the earth in the vicinity. Tests made by the author show that the salt does not reach out at once, but there is a marked tendency to lower the resistance of the leakage path for electrolytic currents through the earth.

Electrolysis conditions in the vicinity of a certain interurban electric railway junction had been under observation for a number of years owing to the frequent failures of water and gas pipes. A total of thirty failures of the water service pipes supplying two adjacent buildings had occurred in twelve years' time. The gas service pipes supplying the same buildings had also been destroyed frequently, and in addition a section of a 6-in. extra heavy cast-iron branch water main crossing under the tracks in this neighborhood had failed three times due to corrosion.

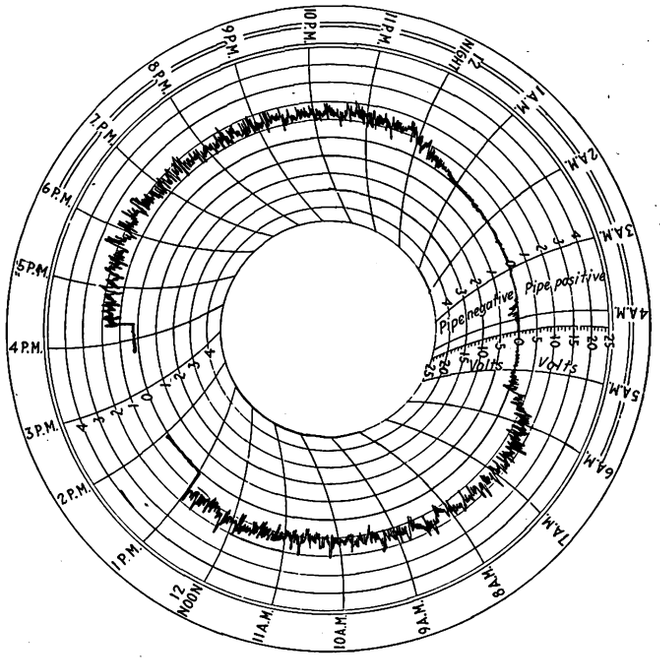
The junction referred to is situated about ½ mile south of a substation which feeds this section of the interurban line. An 8-in. cast-iron water main and a 4-in. cast-iron gas main parallel the rails between the junction and the substation. Tests indicated that at the junction these pipes were at a potential some 9 volts positive to the rails and about 7 volts positive to earth. The pipes were also positive to rails throughout the entire distance between the substation and the junction. Measurements of current on the 8-in. water main indicated a loss of about 20 amp. from the water pipes in the vicinity of the junction.

While the positive potentials of pipes with respect to earth were thus very high for a considerable distance, no failures of pipes had occurred except in the neighborhood of the junction. The circumstance at once led to a suspicion that some peculiar local condition might be the chief factor. It was known that salt had been used on the track switches over a long period of years to prevent freezing. The illustration is a reproduction of a photograph taken in April, 1923, of one of these track switches. The white deposit noticeable on the ground between the rails is a crust of salt crystals remaining from the previous winter's use. That this salt should have withstood the spring thaw and rains shows the extent to which salt had been used at this switch. It was suspected that this salt had gradually seeped into the earth beneath, thus lowering the electrical resistance of the soil and hastening the corrosion of the water main, and that the successive excavations had caused further penetration.

Laboratory tests were therefore made on four samples of the soil, with results as shown in the table:



Record Showing Current Flowing from Water Main to Temporary Ground Rod



Voltmeter Record Showing Potential of Water Main Referred to Earth

VARIATION IN EARTH RESISTANCE WITH CONTENT OF SODIUM CHLORIDE

Sample No.	Per Cent of Sodium Chloride in Dried Sample	Resistivity Ohms per Centimeter-Cube
1	0.0092	21,500
2	0.0023	15,900
3	0.066	710
4	0.300	166

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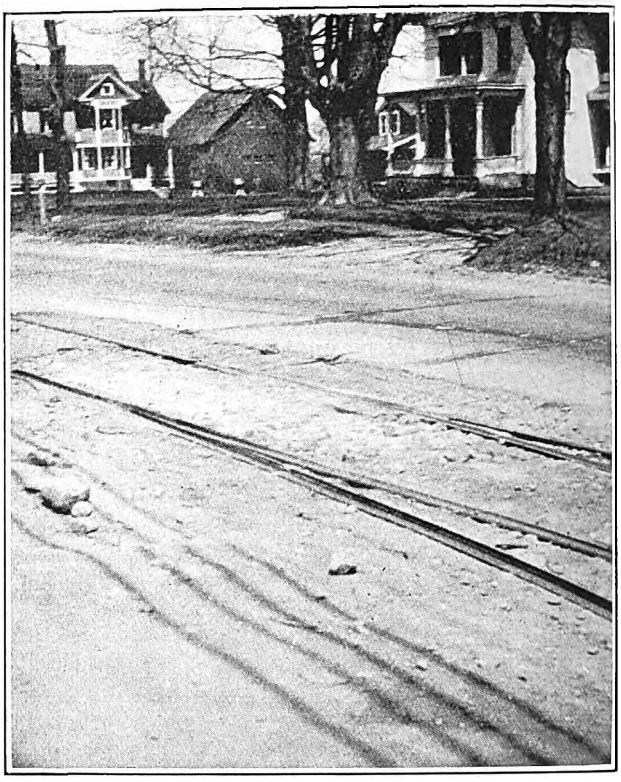
Sample No. 1 was taken from the trolley roadbed at a point some distance from track switches; sample No. 2 was taken from a field close to the track near the substation, while samples Nos. 3 and 4 were taken from the trolley roadbed near the switches in the locality where the pipe corrosion had occurred. The chemical analyses of the four samples showed them to be quite similar in general constituents except that those samples taken from under the track switches contained a very much larger proportion of sodium chloride than the samples taken at points remote from track switches. The table shows that each of the two samples containing the higher proportions of sodium chloride had a very much lower resistivity than the two samples containing the lower amounts.

To show that the low resistivity of samples Nos. 3 and 4 was caused by their comparatively large content of sodium chloride the following laboratory experiment was performed. Sufficient salt (NaCl) was added to two specimens of sample No. 1 to bring their respective sodium chloride contents up to those found in samples Nos. 3 and 4. Resistivity measurements were then made on these specimens. It was found that the addition of the salt had reduced the resistivity from 21,500 ohms per centimeter cube to 1,045 ohms per centimeter cube in one case and to 265 ohms per centimeter cube in the other. These values of resistivity agree closely enough with the values given in the table for samples Nos. 3 and 4 to be considered a satisfactory laboratory check. They indicate clearly that the salt had been the cause of the low soil resistivity encountered near the junction.

The electrolysis effects of the low-resistance earth near the junction were investigated with the McCollum earth-current meter.* The results of tests made with this instrument on a 6-in. cast-iron branch water main crossing under a track switch have been sketched in Fig. 1. It will be observed in this figure that directly under the east trolley rail (test hole No. 1) the resistivity of the soil had the comparatively low value of 660 ohms per centimeter cube. The rate of current discharge from the pipe to earth at this point was excessively high, averaging 578 milliamperes per square foot of pipe surface. About 7 ft. west of the east rail (test hole No. 2) the soil resistivity had increased to 900 ohms per centimeter cube, while the discharge rate, although still very high, had fallen off to 192 milliamperes per square foot of pipe surface. Ten feet west of the east trolley rail (test hole No. 3) the soil resistivity again increased, while the discharge rate became still lower. At a point about 30 ft. west of the east trolley rail (not shown in the figure) the soil resistivity reached the comparatively high value of 60,500 ohms per centimeter cube and the rate of current discharge from the pipe became negligible.

The foregoing measurements show clearly to what extent the soil close to the switches has been affected by the salt, since the resistivity increased rapidly with the distance away from the rails. The rates of current discharge also fell away rapidly with increase of this distance. At the last point tested the surface of the ground is several feet higher in elevation than the tracks and the soil had not been disturbed for making pipe replacements, so that the possibility of salt from the switches penetrating to the pipe was slight. The rates of current discharge found under this switch were

*The McCollum earth-current meter was described in detail in the ELECTRIC RAILWAY JOURNAL for Nov. 5, 1921.



A Crust of Salt Crystals Remaining from the Previous Winter's Use

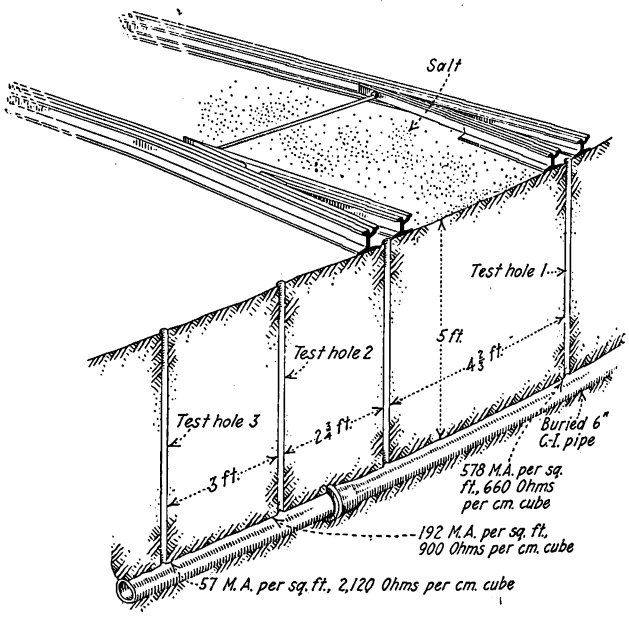


Fig. 1—Earth Samples Taken from Various Test Holes Showed Increasing Resistance as Distance from the Switch Increased

unusually high and easily account for the severe corrosion which had occurred there. Data collected by the Bureau of Standards show that material electrolytic corrosion has been found where the current discharge rate is 3 or 4 milliamperes or higher per square foot of pipe surface.

The unusually low resistance of the soil near this switch was strikingly illustrated by the following occurrence: It was found that by connecting a small copper wire between the water main and a piece of ¾-in. iron pipe driven about 2 ft. into the earth near the trolley rails a fluctuating current reaching peaks of over an ampere flowed from the pipe to the ground rod. Twenty-four-hour records of the current delivered

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over this connection and also of the potential difference between the water main and this ground rod are shown reproduced in Fig. 2. The large magnitude of this current is unusual and was made possible only by the very low resistance of the earth at this point, since the contact area of the ground rod was comparatively small (0.5 sq.ft.). If driven into the normally high-resistance earth common to this region, a potential difference of 7 or 8 volts between this ground rod and earth would cause a current flow of only a few milliamperes.

Measurements of soil resistivity and current discharge were also made along the water mains at other points in the positive pipe-to-rail potential area. The results of the resistivity tests are shown in the graphic chart. The curve shows the general prevalence of relatively high-resistance soil except in the vicinity of the track switches, where it has been reduced by the salt.

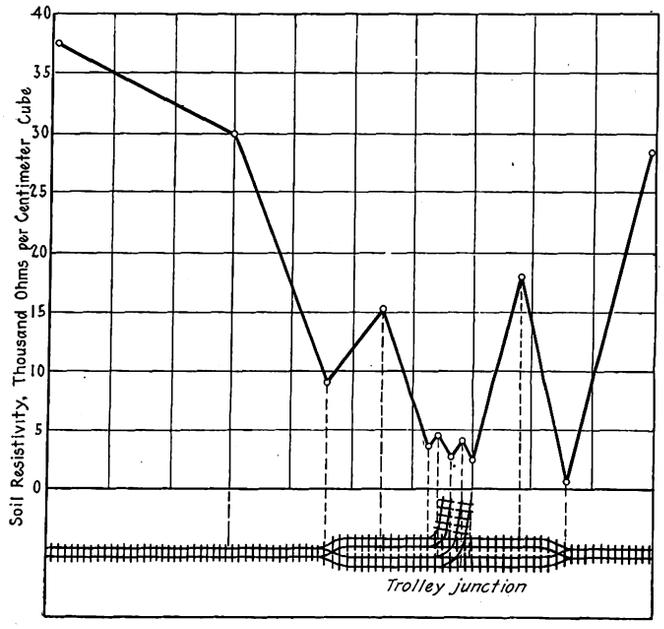

Fig. 2—Soil Resistivity in Relation to the Switch Location

The two water service pipes mentioned previously, which had so frequently required replacement, branch from the main water supply line opposite the junction and extend across the street under the switches. The earth in the ditch containing the service pipes had been kept wet by the leaking pipes and loose by the frequent excavations for repairs. The wet loose earth had allowed salt from the switch to make its way along the ditch as far as the water main, and water from the ditch making its way along the main itself carried the salt with it for some distance on either side of the service taps. It was found that near these taps the soil immediately surrounding the main had a resistivity of only about one-quarter of the value found 3 ft. above the main. The pipe at these points was discharging current to earth at average rates of from 4.6 to 67.5 milliamperes per square foot of pipe surface. Physical examination showed this section of the main to be so badly corroded that it required relaying 215 ft. of pipe.

Earth-current meter tests on the water pipes at locations where there were no switches in the track, and therefore where no salt had been used, showed a uniformly high soil resistance and only a slight discharge of current from water pipes to earth. Very little corrosion was found on the pipes at these points.

The positive potentials of the water pipes with respect to trolley rails in the section under discussion, with the present conditions of railway load and power distribution, are maintained at comparatively high values chiefly by the predominance of high-resistance earth. As a result, service pipes or branch mains which closely approach or cross under the trolley tracks in the narrow sections of low-resistance soil near the track switches are subjected to extremely destructive rates of current discharge to earth.

It is obvious that in this particular case the practice of using salt to prevent freezing of track switches has brought about a troublesome electrolysis problem in a region where, under normal conditions, there would be little tendency for electrolysis trouble to develop. The frequent and costly interruptions to water, gas and trolley service in the past, and the possibility of their recurrence in the future, would certainly justify the development by the railway of some other method than the use of salt for keeping track switches clear of ice and snow.

Use of Salt Should Be Restricted

It should be pointed out that soil of high electrical resistance is one of the few natural hindrances to stray currents, and the owners of underground metallic structures should at least be able to count upon the measure of protection which this natural condition affords. For this reason the careless use of salt at track switches and special work, or any similar practice which tends to break down the soil resistance, unnecessarily increases the electrolysis hazard. The most directly harmful effects of the use of salt on the tracks are felt in the areas where the buried metallic structures are positive in potential to the rails. Objectionable effects are also present in the negative potential areas where the narrow belts of low resistance earth produced by the salt may deliver large amounts of railway current to the subsurface structures. This current may leave the structures for earth and augment corrosion in the positive areas. As in the case under discussion, conditions in a given locality may thus become aggravated to the point where the electrolysis problem is brought to a head, where otherwise the damage might have progressed at so slow a rate that the situation would not require summary attention.

These considerations seem to indicate that the use of salt at track switches and special work should be under careful supervision. Instead of being left in the hands of irresponsible track laborers, as is generally the case at present, it should be used under the direction of a responsible railway engineer, so that the quantity used, if any, could be kept at the practical minimum, and that suitable provision could be made and maintained for draining off surface water from the roadbed adjoining switches.

Capital Line Insures Employees

CO-OPERATIVE group insurance, including sickness and accident benefits as well as ordinary life insurance, has been established by the Washington, Baltimore & Annapolis Electric Railroad for its employees. This is underwritten by the Metropolitan Life Insurance Company and affects some 350 employees of the railway. Premiums are paid jointly by the workers and the company.

The total coverage amounts to about $530,000 life

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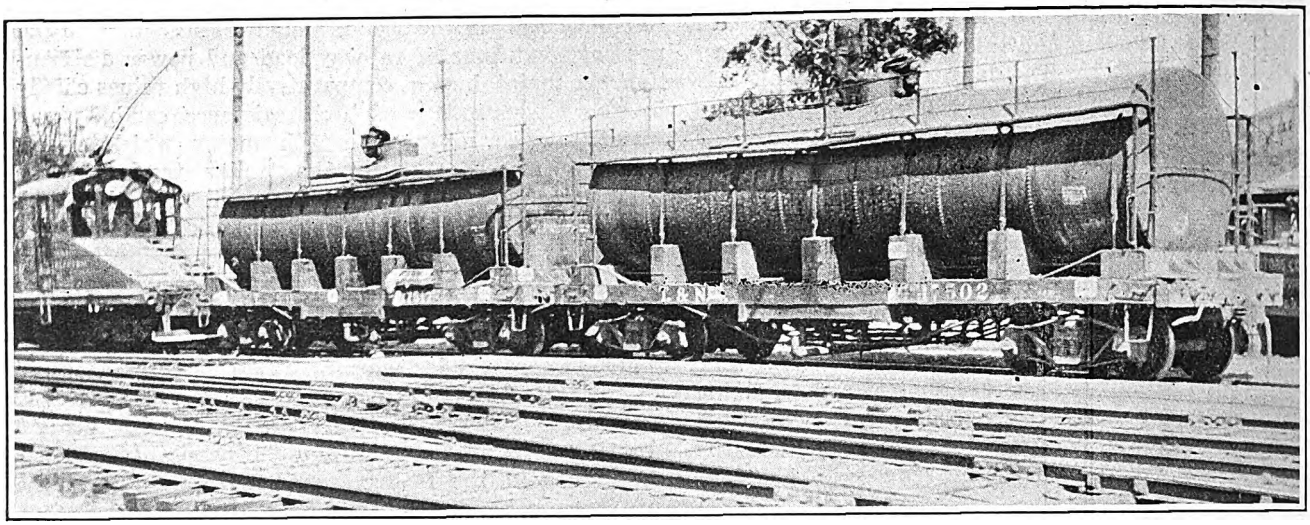


Weed-Killing Tank-Car Equipment Used by the Pacific Electric Railway

insurance and the same for accidental death and dismemberment insurance. Each employee subscribing to the plan receives $1,000 life insurance and a similar amount of accidental death and dismemberment protection. Health and accident insurance provides a benefit of $10 a week for a maximum of 26 consecutive weeks.

Supplementing the usual insurance provisions of the policy, which include a total and permanent disabiilty clause, are certain service advantages, such as a free visiting nurse service and a department for the distribution of booklets and other literature on health subjects and sanitation.

Killing Weeds with Poison

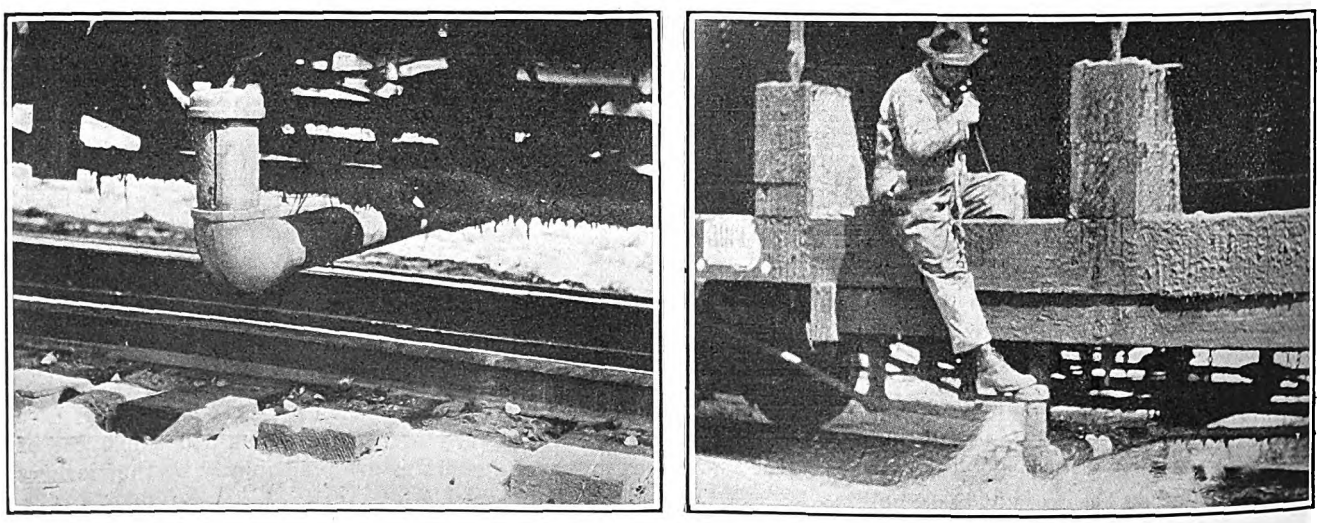
Application of Arsenite on Pacific Electric Railway Has Prevented Their Growth Along More than 1,000 Miles of Track

WEEDS as well as flowers flourish in the southern part of California, and one of the problems of the Pacific Electric Railway is to keep the tracks clear of such growths. Sodium arsenite, used extensively during 1923 and 1924, has been proved an efficient weed killer and is now being applied each season over 74 per cent of the 1,115 miles of track operated by the company. The magnitude of this phase of the company's operations is indicated by the expected expenditure of $51,000 for the purpose in 1925. More than 90 per cent of this sum will be for the poison and its haulage from the plant of the United States Smelting, Refining & Mining Company at Salt Lake City, Utah.

Four 12,000-gal. tank cars and one work motor car are used. A 4-in. quick-acting valve is connected to the bottom of the tank car, piping from which extends to each side, as shown in an accompanying illustration, being connected to an elbow, an 8-in. length of pipe and a cap. The elbow and piping are slotted ¼ in. for the release of the poison. The valve is controlled by rope connection. From 10 to 12 ft. of ground is sprayed beyond each rail, the apparatus covering a total width of about 30 ft. The unit travels at 15 m.p.h.

Sodium arsenite is shipped in concentrated solution form. To treat 800 miles of single track 80,000 gal. is mixed with 200,000 cu.ft. of water. The dilution is made immediately prior to use, the agitation caused by the movement of the train being sufficient to insure adequate mixing and to prevent segregation. The car is first filled with the required amount of water and the concentrated poison in another car is added by means of a 2-in. centrifugal pump, operated by a 5-hp. motor.

Despite the heavy initial expense the use of arsenite has proved economical. Weed growth is being reduced year by year, and the fire hazard has been eliminated. Application of the poison has been found to be more effective when the soil is damp.



At Left—A ¼-In. Slot Is Made in the Vertical Pipe and Elbow to Spray the Poison. At Right—The Poison Sprayer in Action

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Economies in Operation Proposed for Railway in Colorado Springs

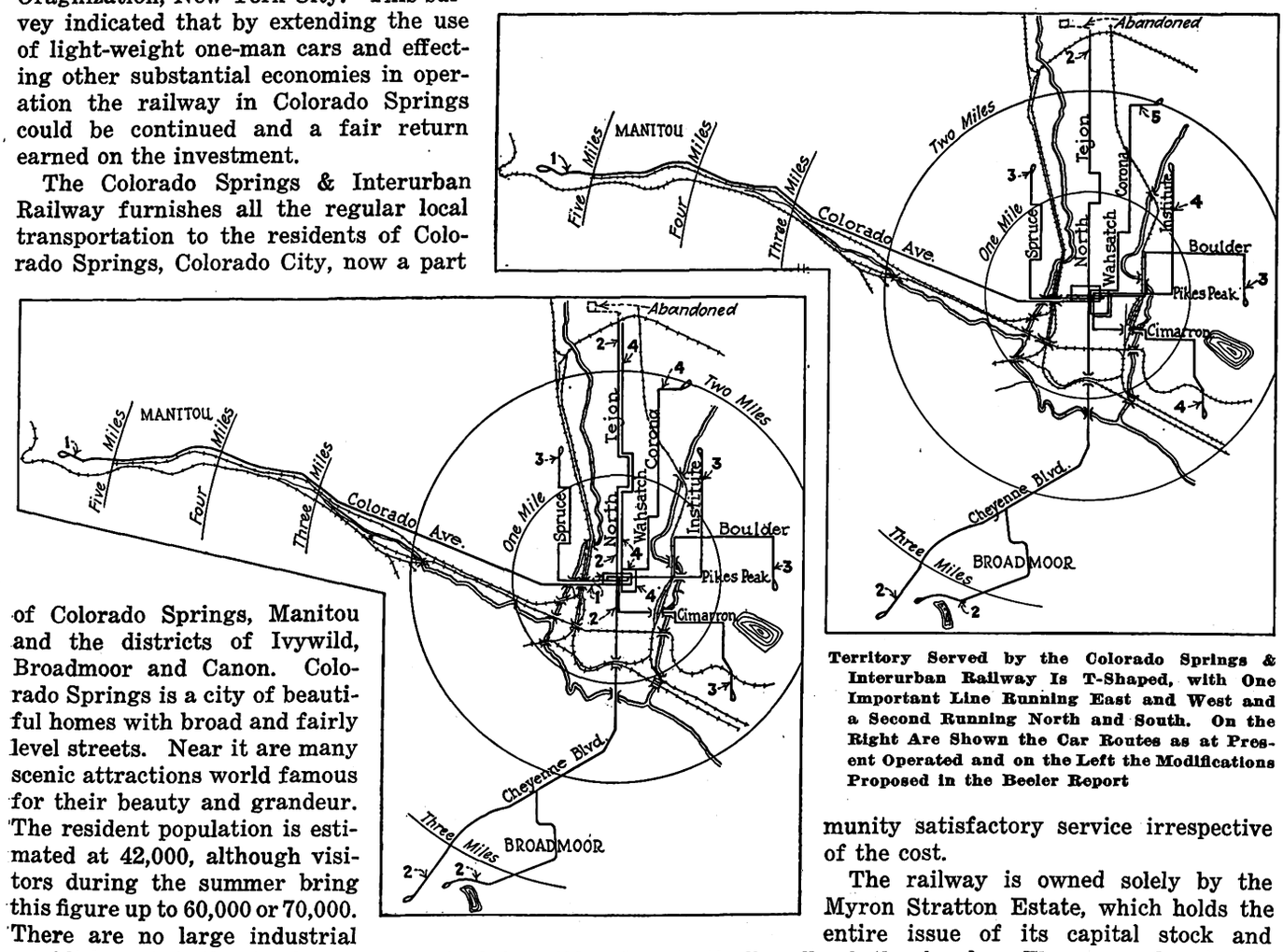
More Extensive Use of Light-Weight One-Man Cars and Relief from Excessive Tax Burdens Are Recommended in Beeler Report—New Franchise Should Provide an Adjustable Rate of Fare—Purchase of Power Would Result in Substantial Savings

FRANCHISE rights for the operation of several railway routes in Colorado Springs expire within the next twelve months. For the past eleven years the cost of service has exceeded the gross revenue and the accumulated deficit is now nearly half a million dollars. Whether or not to abandon the lines for which franchises are about to expire and what to do with the system as a whole were questions with which the owners of the property were faced. To find the best solution of this problem a survey of the entire transportation situation was made for the company by the Beeler Oragnization, New York City. This survey indicated that by extending the use of light-weight one-man cars and effecting other substantial economies in operation the railway in Colorado Springs could be continued and a fair return earned on the investment.

The Colorado Springs & Interurban Railway furnishes all the regular local transportation to the residents of Colorado Springs, Colorado City, now a part of Colorado Springs, Manitou and the districts of Ivywild, Broadmoor and Canon. Colorado Springs is a city of beautiful homes with broad and fairly level streets. Near it are many scenic attractions world famous for their beauty and grandeur. The resident population is estimated at 42,000, although visitors during the summer bring this figure up to 60,000 or 70,000. There are no large industrial establishments in the city, but on account of the mild and equable climate a number of important national and state homes have been located there.

A total of 32 cars are operated over 41.85 miles of track. Five car lines amply cover the entire community, as shown on the accompanying map. The populated area forms roughly a "T"-shaped district covering about 12 square miles. The two principal car lines are each approximately 6 miles in length and operate at right angles to each other.

Examination of the property showed that it had been maintained in first-class condition. All tracks are in excellent shape and the railway is fully equipped with modern light-weight one-man cars, all in good condition. Shops and car storage facilities are ample. The service rendered has been adequate and first class in every respect. It is apparent, the report states, that the policy of the management has been to render the community satisfactory service irrespective of the cost.



Territory Served by the Colorado Springs & Interurban Railway Is T-Shaped, with One Important Line Running East and West and a Second Running North and South. On the Right Are Shown the Car Routes as at Present Operated and on the Left the Modifications Proposed in the Beeler Report

The railway is owned solely by the Myron Stratton Estate, which holds the entire issue of its capital stock and practically all of the bonds. The proceeds of this estate are by direction of its founder to be used for the purpose of creating and maintaining the Myron Stratton Home, a large charitable institution located immediately beyond the limits of the city. The estate is managed by a board of trustees.

Results of railway operation for the years 1914 to

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TABLE I—REVENUE AND EXPENSES DURING PAST ELEVEN YEARS

Year	Revenue	Operating Deductions	Fixed Charges	Deficit
1914	$421,715	$387,888	$80,000	$46,173
1915	414,962	368,031	80,000	33,069
1916	397,336	330,850	80,000	13,514
1917	396,021	337,386	79,167	20,532
1918	378,726	368,966	75,069	65,309
1919	495,370	417,525	79,354	1,509
1920	552,987	499,586	79,938	26,537
1921	536,054	506,969	75,000	45,915
1922	510,443	508,247	75,183	72,987
1923	480,881	475,471	75,000	69,590
1924	445,177	426,387	79,366	60,576
Total	$5,029,672	$4,627,306	$858,077	$455,711

TABLE II—FARE SCHEDULES EFFECTIVE 1914-1924

Date Effective	Cash Fare—Cents Adults	Children	No. of Tickets for One Dollar Adults	Children	Weekly Passes
Jan. 1, '14–June 7, '19	5.0	2.5	22	..	
June 8, '19–Jan. 5, '21	6.0	3.0	18	36	
Jan. 6, '21–Mar. 18, '23	7.0	3.5	16	32	
Mar. 19, '23–June 5, '23	7.0	3.5	16	32	$0.75 to $1.75
June 6, '23–Sept. 29, '23	7.0	3.5	16	32	
Sept. 30, '23–Mar. 24, '24	7.0	3.5	16	32	$0.75 to $1.75
Mar. 25, '24–June 14, '24	7.0	3.5	16	32	
June 15, '24	10.0	5.0	..	..	$1.00 to $2.00

TABLE III—PASSENGER AUTOMOBILE REGISTRATION 1 14–1924

Year	Passenger Automobiles	Population per Passenger Automobile	Year	Passenger Automobiles	Population per Passenger Automobile
1914	1,098	32.65	1920	5,939	6.33
1915	1,568	23.02	1921	6,291	6.00
1916	2,242	16.19	1922	6,104	6.24
1917	3,195	11.40	1923	8,816	4.47
1918	3,945	9.35	1924	9,576	4.22
1919	4,870	7.65			

Note—Automobile registration for year 1924 is for ten months ended Oct. 31. The years 1920-1923 are from actual records. Prior to 1920, registration is based on proportionate registration in the United States as compiled from statistics furnished by the National Automobile Chamber of Commerce.

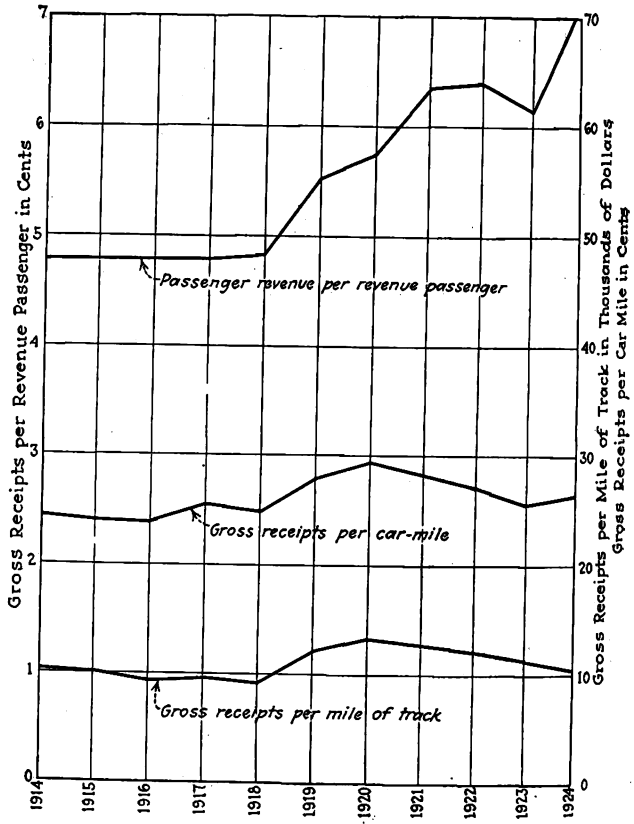
1924 inclusive are summarized in Table I. From this it will be seen that the company has not only failed to earn sufficient to pay for the cost of service rendered in any one of the eleven years but that the annual deficit accumulated up to the close of 1924 was $455,711. More than half of this deficit has been created during the past four years of operation.

Until about June 1, 1919, the company operated on a 5-cent fare. Since then local fares have been changed seven times, as shown in Table II. Results from the different rates of fare are shown graphically in an accompanying chart. Prior to 1919 the passenger receipts per revenue ride were less than 5 cents. Since then the trend has been upward, the average for 1924 being 7.11 cents. During the latter year three different schedules were in effect. The last one, which is still in effect, was established June 15, 1924, and is as follows: Adult's cash fare in each zone, 10 cents; half fare in each zone, 5 cents; weekly pass in the inner zone $1.25, weekly pass in the outer zone $1, weekly pass for both zones $2.

Inauguration of this combination schedule was followed by a loss of 27 per cent in revenue riding and brought about an actual decrease in the total passenger revenue. An analysis of the last six months of the year showed that 1,918,040 cash passengers or 63 per cent of the total revenue passengers contributed 77 per cent of the revenue at an average rate of 9.85 cents per revenue ride. Using the weekly pass 1,139,960 passengers or 37 per cent of the total contributed only 23 per cent of the revenue. These paid an average of 4.98 cents per revenue ride.

On the average the present fare schedule is yielding 8.06 cents per revenue ride. It has resulted in lowering the fare to less than 5 cents for a minority and raising it to 10 cents for the majority. A difference of 100 per cent, the report states, seems too great a variation for the cost of a ride. A more equitable solution is recommended, including a ticket rate that will be within the reach of all, in order that the majority may have the advantage of a lower rate and only the occasional rider be required to pay the maximum fare.

In order to determine the financial status of each of the various lines a thorough analysis of their revenues and expenses was made. Four so-called feeder lines failed to earn their operation costs by $33,354. The two main lines earned an operating net of $46,644, which, together with the freight earnings of $997, resulted in net earnings from operation of $14,287 available for interest. Since the survey was undertaken one feeder



Recent Fare Increases Have Increased the Revenue for Passenger Traffic, but Consequent Decreases in Traffic Have Caused a Loss in Gross Revenue

line has been abandoned. It is expected that this will reduce the annual net losses by about $4,500. The line was one that should never have been built, the report says, as the traffic survey showed that it averaged only one passenger per car-hour.

Investigation indicated that the feeder lines were earning an average of 21 cents per car-mile while the average operating costs were 26 cents. The report states that the feeder lines by themselves cannot be made self-sustaining under any rate of fare, but that the operating deficit can be reduced by certain changes in routes and schedules.

It had been suggested that the feeder line be abandoned and car service replaced with buses. At the present time this would be a mistake, the report states, because these lines are not earning enough even to cover the cost of service with modern light-weight one-man cars operating on steel rails with no interest paid on the investment. Bus operating costs would be more than these lines are capable of earning. Moreover, many miles of streets would have to be paved at con-

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siderable public expense, whereas under present conditions these streets answer for all practical purposes.

A factor of great importance in the street railway situation in Colorado Springs is the tremendous growth in the use of the private automobile. The number has increased from 1,098 in 1914 to 9,576 in 1924. There is now one for every 4.22 inhabitants or more than one automobile for every family in the city. Nevertheless, until the last fare change was made the railway had retained practically 90 per cent of its traffic after ten years of this competition. Automobile registration figures by years are given in Table III on the preceding page.

Functions of the street railway and the private automobile are not identical, the report states, and one will never satisfactorily supplant the other. If twice as many private automobiles were in use as at present the need for public transportation service would be as imperative as it is now, and the railway would still be a vital and essential public necessity. Further increase in the number of automobiles will bring about new problems for those who use them. Parking space will be in greater demand. In fact, with double the number of automobiles in use, the traffic on the railway would probably be materially increased. Moreover, the automobile stimulates the riding habit and has done more to impress the public with the necessity of good transportation than has any other one thing. To those familiar with the cost of automobile transportation the railway's need for a living rate of fare is better understood and its economical advantages appreciated.

TABLE IV—PROPOSED ADJUSTABLE FARE SCHEDULE

	A	B	C	D
Adult cash fare per zone, cents	5	10	10	10
Children, cash fare per zone, cents	5	5	5	5
Ticket fare per zone, cents	..	6.25	8.33	..
Number of tickets or tokens for 25 cents	5	4	3	..

In Colorado Springs the railway is an essential and necessary public utility. Its tracks are located so as to care adequately for the present and future requirements of the community and to provide a basis for economical public transportation. Both the growth and welfare of the district socially and commercially are dependent upon the continuance of its operation. This must be either by the Stratton Estate, the city or some other responsible agency. As the city has recently acquired the property of the local electric light and power company the chances for interesting an outside organization are slim and the possibilities for future ownership apparently narrow down to a choice between the Stratton Estate and the city.

If the trustees of the estate are to continue to own and operate the property they should be permitted to do so the report states, under conditions that will be fair both to them and to the city. A franchise should be entered into that will permit the railway to earn operating expenses and a reasonable return on the investment. Among other things it is recommended that the franchise provide for an adjustable fare schedule based on the cost of rendering service, and an equitable adjustment of the tax situation. For rate-making purposes a fair value of the property should be determined and agreed upon and a reasonable rate of return fixed. An adjustable fare schedule of this kind is shown in Table IV. This provides an even money schedule with no penny changing or annoying delays by adjusting the intermediate fare rates through ticket sale. The minimum sale unit of 25 cents is within the reach of all regular riders. Transfers will be free.

A barometric fund of $75,000 should be provided to cover the wide seasonal variations in traffic. Whenever the cost of service exceeds the gross revenue by more than $50,000, thereby reducing the $75,000 fund to less than $25,000, the next higher rate provided in the schedule should automatically become effective on the first day of the next calendar month and should continue in effect during a period of at least three months. On the other hand if the normal fund be increased by more than $50,000, making it in excess of $125,000, the next lower rate of fare should automatically become effective on the first day of the next month. In no event should the fare be changed more than once in three months and then with not less than five days notice. It is to be understood, however, that there would be nothing to prevent the company from voluntarily lowering the fare at any time should it so desire. Estimates of the number of passengers to be carried and the revenue produced under present and proposed rates are shown in Table V.

TABLE V—ESTIMATED EFFECT OF PROPOSED FARES

Schedule	Annual Revenue Passengers	Total Passenger Revenue	Revenue Per Revenue Passenger (Cents)
A	6,350,000	$317,500	5.00
B	5,640,000	371,575	6.58
C	5,043,000	424,907	8.42
D	4,610,000	449,475	9.75
Present	5,278,850	425,475	8.06

Most of the car lines are now routed through the business center of the city from one residential district to another. These lines are fairly well balanced, the investigation showed, and with the exception of minor adjustments in the amount of service required few changes are suggested. The present and proposed routing is shown on accompanying maps.

It is recommended that the use of old heavy cars for passenger service be entirely eliminated. By this means the number of two-man car-hours will be reduced 26,556 per year. The schedule speed should be increased from 9.99 m.p.h. to 11 m.p.h. This, with the excellent track, broad streets, easy grades and few stops per mile, will do much, the report states, to remove the prejudice that street cars are slow. This has been created in the minds of the passengers largely by the fact that stops have been unnecessarily long because many of the operators are slow in opening and closing the doors. After making provision for paying a bonus for one-man operation an annual saving of $29,000 in trainmen's wages should result from the substitution of one-man cars for the present combination service.

A study of the present power requirements showed that for each heavy car-mile operated approximately 3.78 kw.-hr. were required and for each Birney car-mile 1.51 kw.-hr. Applying these rates of energy consumption to the proposed schedules it is estimated that 2,300,000 kw.-hr. will be required annually. The report states that energy can be purchased from the city at 0.9 cent per kilowatt-hour, including the labor required to maintain the overhead system. Such an arrangement would result in a substantial saving for the railway and at the same time afford the new municipal plant an enlarged output and an improved load factor. It is recommended that power be purchased and the company's power station be held in reserve for emergency use. A total saving of about $31,000 a year is predicted in power cost.

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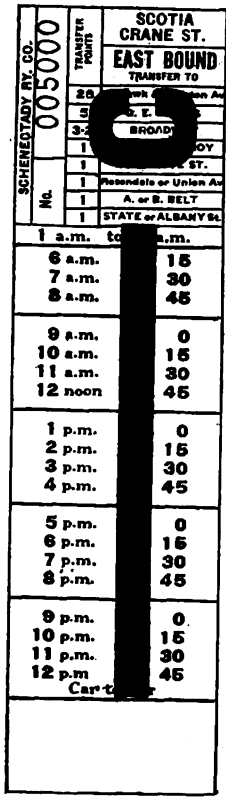
Taxes are levied against the company under thirteen different classifications, the principal ones being the state corporation license, pole and wire tax, state and county tax, street paving and school tax. It is estimated that the total amount of taxes for the year 1924 will be more than $51,000. This is 11.67 per cent of the gross revenue, or higher by 50 per cent than the charges in other comparable cities. It is recommended that street paving assessments be reduced, special license taxes be removed and franchise taxes based on gross income be eliminated.

Various other economies are recommended in the report. It is estimated that under the proposed methods of operation total operating deductions will be $314,525 a year as against $426,386 at present. Applying this figure to the estimated revenue under the four proposed rates of fare it is found that schedule A will result in a deficit of $59,695 and schedule B in a deficit of $5,620.

On the other hand, it has been estimated that schedule C should result in a surplus of $47,712 and schedule D in a surplus of $72,280. Adoption of schedule C, therefore, would make the first mortgage bonds marketable and permit a small interest payment on the capital stock. The report recommends that a new franchise protecting the railway from unwarranted competition and reducing the present heavy tax burdens be granted the company. Adoption of schedule C and the economies recommended in the report would then enable the railway to continue operation on a firm and satisfactory basis.

Red Band on Transfer Indicates Direction



New Directional Tear-Off Transfer Adopted by the Schenectady Railway

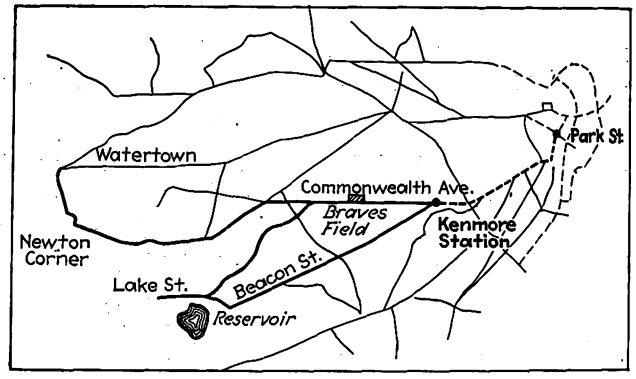
A NEW form of directional tear-off transfer was adopted by the Schenectady Railway on March 1, to supersede the old-fashioned punch transfer formerly used. In many respects the new type is similar to that used by the Bangor Railway & Electric Company, Bangor, Me., and described in the issue of this paper for Sept. 13, 1924, page 392. The transfer holder is also similar. A feature of the new design is a perpendicular red line which appears on all outbound transfers to enable the operator to distinguish at a glance between outbound and inbound transfers.

Each line has a different color transfer. The name of the issuing line is printed in large type at the top and the lines on which it is good are shown on the face. Opposite each line is a number indicating the transfer point, while on the back a corresponding number tells the location of the transfer point.

Instead of printing the ordinary date, one of a series of twenty letters is used for this purpose. This is more flexible and eliminates waste. A somewhat similar arrangement used by the Stone & Webster properties, southeastern district, was described in ELECTRIC RAILWAY JOURNAL for Oct. 4, 1924, page 548.

Stop Elimination Speeds Up Service in Boston

SIGNIFICANT reductions in running time have recently been made by the Boston Elevated Railway on three important lines. The first step in this direction was taken on Dec. 1, 1924, when seventeen stops were eliminated on the Beacon Street line between



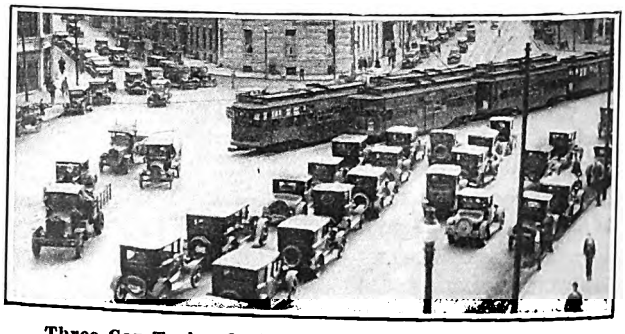
Important Reductions in Running Time Have Been Made by the Elimination of Stops on Three Heavy Lines of the Boston Elevated Railway

Kenmore Station and the reservoir. This line operates via the Boylston Street subway from Park Street to Kenmore Station and beyond that point on the surface via Beacon Street to the end of the route. Three-car trains operate on a three-minute headway during the rush. At other times two-car trains or single units are used and the headway is longer.

The old running time from Kenmore Station to the end of the line was fourteen minutes, and it was extremely difficult to keep cars on time. The new spacing of stops averages four to the mile and the running time has been reduced two minutes in each direction, or four minutes a round trip. Moreover, the company has found that it is easier to keep cars on time with the fast schedule than it was with the slower schedule.

Some opposition developed at first to the elimination of certain stops. To satisfy the complaints three were restored, leaving a net gain of fourteen. On April 1 the same plan was adopted for the Lake Street line and the Newton-Brighton-Watertown line. These routes are operated with trailer trains on three-minute and 3½-minute headways in the rush hour. Single cars are operated only for short periods.

Between Watertown and Kenmore Station six minutes are saved on the round trip. Between Lake Street and Kenmore Station the saving per round trip was four minutes. This reduction in running time has so pleased patrons of the railway that requests have been made by the public for the elimination of other stops. The company is planning to accomplish savings on other routes by the adoption of a similar plan.



Three-Car Trains On Beacon St. Near Kenmore Station

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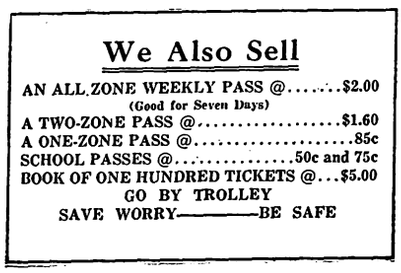
Beaver Valley Traction Introduces Sunday Pass

ON EASTER SUNDAY, April 12, the Beaver Valley Traction Company, which has been using a great variety of adult and school weekly passes since Feb. 13, 1922, added a pass good for Sundays only. The price of 25 cents compares with a fare of 5 cents per zone, but as the pass is available for all the trolley zones of the company it is possible to ride the full eleven zones (20 miles) between Leetsdale and College Hill and then take a few more trips on side routes. Examination of the Sunday pass as reproduced shows that it not only suggested excellent uses, but also the back was utilized to push the sale of the weekly pass.



Front and Back of Sunday Pass Introduced by the Beaver Valley Traction Company on Easter

In its more than three years of pass experience, the company has increased weekly pass sales from $513 to approximately $2,100, which represents a maximum sale of nearly 1,700 passes at prices ranging from 50 cents for a school pass to $2 for an all-zone adult pass. Because of his belief and enthusiasm in the pass plan, C. D. Smith, general manager, has found it possible to increase sales by more than 30 per cent over the same months a year earlier. This has been achieved partly by seeing that all the car operators were always kept amply supplied, partly by placing the pass on sale at five different stores and partly through advertising.

When the Sunday pass was introduced, Mr. Smith went still farther in sales effort, for department heads and office employees were also enlisted as salesmen in addition to those selling the weekly passes. The colored janitress with a sale of 25 passes actually did better than all other employees outside the car operators. Two of the latter were tied for first place with a sale of 90 passes each. Prizes of $3, $2 and $1 had been offered as an incentive for the first Sunday.

So far as actual revenue is concerned the idea of putting more life into the Sunday riding proved a success. In addition to the 1,559 weekly passes still good on Easter Sunday, the last day of the pass week, the company sold 1,341 Sunday passes. As only 2,000 passes had been printed, a number of operators found themselves running short before the day was over.

The revenue from the Sunday passes on April 12 was $335; adding this to the cash fares and pro-rated weekly pass receipts of $1,079 gave a total revenue of $1,414, compared with $1,382 on Easter Sunday in 1924. Last year's Easter Sunday, however, included $58 on the Riverview line, which is now operated separately as a part of the Beaver Valley Motor Coach Company. Therefore, the comparative figure for last year is $1,324 and the gain in revenue becomes $90 or nearly 6.8 per cent. Even though Easter of this year was a more pleasant day than Easter of 1924, the management is inclined to the belief that the Sunday pass was the cause for the increased revenue. It has good grounds for this in the fact that the two preceding Sundays, April 5 and March 29, ran $132 and $93 respectively under the two Sundays preceding Easter, 1924.

As was true at Pittsburgh, the Sunday pass proved a particular hit with children. The trainmen also reported an unusually large number of young couples, due, probably, to the combination of Easter finery and Sunday passes.

One incident that showed the immediate ride-creating power of the pass was that a maid who had been engaged by the wife of a company official called in person to state when she would begin her duties. The girl said that she had intended telephoning, but as she had bought a Sunday pass it occurred to her that a personal visit would be more satisfactory.

The Readers' Forum

Fair Attitude Commended

CITY OF DETROIT
Department of Street Railways
May 23, 1925.

To the Editor:

I want to congratulate the JOURNAL upon its fairness and broad-mindedness in printing the editorial of last week which commented upon our third anniversary. I think you have shown that you are one trade paper in a thousand, by your boldness and fairness in making the statement you did. Altogether, I think such an attitude is a mighty healthy one and augurs well for your influence on the entire electric railway industry.

We, here in Detroit, do not believe that municipal ownership and operation is a general panacea to be applied everywhere. On the contrary, we would be absolutely against the idea of this type of ownership and operation in the majority of the cities in the United States. What this operation has demonstrated to the writer is that were the actual professional street railway men of the companies allowed to do the job as good craftsmen would wish to do it, there would be a great deal less ailing in the street railways of the country.

ROSS SCHRAM,
General Manager.

Safety Council Emphasizes Need of Sustained Effort

NATIONAL SAFETY COUNCIL
CHICAGO, June 1, 1925.

To the Editor:

It is a pleasure to read the editorial in your issue of May 23 entitled "Sustained Effort Is Necessary to Achieve Results in Safety Work." The electric railway companies and the community organizations that have accomplished permanent results in the reduction of public accidents know that spasmodic and spectacular campaigns often accomplish more harm than good. We go so far as to recommend that a "Safety Week" or similar campaign should never be undertaken except as the beginning of a permanent, continuous program of public safety education.

S. J. WILLIAMS,
Director Public Safety Division.

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Association News & Discussions

Well-Balanced Program at Mid-West Meeting

Use of Buses by Electric Railways, Track Construction and Maintenance Costs, Improvements in Equipment, Safety Work and Bus Regulation Were Among the Subjects Discussed

ONE of the most successful meetings ever held by the Mid-West Electric Railway Association took place at the Baltimore Hotel in Kansas City, Mo., May 25 and 26. Papers on subjects ranging from co-ordination of rail and bus transportation to the maintenance of track were actively discussed by some 150 electric railway men present and furnished the basis for a comparison of experiences and practice.

Under the subject of "Co-ordinated Transportation," F. G. Buffe, general manager for the receivers Kansas City Railways, not only presented an exhaustive discussion of the place of the bus in the modern scheme of transportation but also outlined some of the principal design requirements for present-day city bus operation. This paper is abstracted elsewhere in this issue.

In a paper on "Track Construction and Maintenance Costs" R. H. Findley, superintendent of track and roadway Omaha & Council Bluffs Street Railway, called attention to the importance of unsprung weight on cars as a factor in the life of electric railway track. An abstract of the paper appears elsewhere in this issue.

Ernest Stenger, president and receiver Denver Tramway Company, expressed his gratification at the large attendance and keen interest displayed during the meetings. He pointed out the value of sectional association activity, holding that such meetings supplement the work of the American Association by bringing railway men in a given territory together for better acquaintance and understanding of sectional interests. He laid particular emphasis on the importance and value of frank and informal discussion of common problems.

Other papers on important present-day railway subjects rounded out a well-balanced program and helped to stimulate discussion. Taking up the matter of organized safety work, B. Hilburn, general manager Tulsa Street Railway, Tulsa, Okla., said that accident prevention has a broader significance than the mere saving of injury claims. From the humane standpoint it affords the opportunity for the conservation of life and limb, and in addition to that is of material importance in building good will through the reduction of injury law suits. Another important result obtained from properly organized safety work was held to be the constructive effect of interest aroused in the mind of the operator, upon his general attitude toward his work and toward the public. With this end in view, the safety organization in Tulsa, Mr. Hilburn said, combines the work of accident prevention with what is generally termed welfare work. This activity is handled through a central committee which directs the work of sub-committees and of team captains. These sub-committees include a "safety committee," an "equipment committee" and a "publicity committee."

Constant vigilance is necessary to avoid lagging of interest in this activity, and a safety director is employed to devise new ways of arousing interest and keeping the work active. The personnel of various teams is selected by the elected team captains. Each captain chooses the members of his team in rotation, until all employees are selected. The organization of these teams is broken up frequently so as to prevent discouraging the individuals on a particular team which ends the contest with a low record.

In grading the teams, the nature and consequences of each accident, rather than number of accidents reported, are considered by the central committee. Any negligence of the operator receives careful consideration, with the result that the trainmen members of the central committee receive invaluable first-hand knowledge of the character of negligence which results in accidents. This general plan was started in February, 1923, in Tulsa, and resulted in a reduction of accidents reported in 1923 to 865 as compared with 1,560 in the year 1922. At the same time accident law suits were reduced from eleven, involving $146,000 in claims for 1922, to five involving $71,000 in 1923. In 1922, $9,280 was paid in claims without litigation, while in 1923 this was reduced to $2,831.

Improved Design Reduces Motor Maintenance Cost

Steps which have been taken by manufacturers in the reduction of first cost and maintenance of car equipment were outlined in a paper by J. C. Thirlwall, General Electric Company. He said that weight reduction affords a ready method of reducing first cost and power consumption, but that ultimate saving is dependent on holding down maintenance cost as well. Figures were cited to show that a balance between these various factors had apparently been made on commonly used modern types of equipment, both single and double truck.

Modern types of motor equipment, Mr. Thirlwall held, have effected material reductions in maintenance costs over older and heavier motors. Even when equipped with modern gears, improved bearings and better brushes, lubrication and insulation, the average maintenance cost of many of these older and heavier types of equipment, he said, ranges from $3.50 to $4 per 1,000 motor-miles, while modern and lighter motors are being maintained for from 50 cents to $1 per 1,000 miles. This reduction was attributed to improved design, the use of higher grade materials and better construction in the motors. At the same time it was pointed out that improved maintenance practices and machinery have helped to bring these costs down.

As an illustration of the improved performance of modern motors, records of the Connecticut Company for the years 1922, 1923 and 1924 were quoted. According to these figures, older motors of the GE-67, GE-70, GE-80, GE-87, West.-68, West.-93 and West.-101 types were operated a total of 143,000,000 motor-miles with 1,057 armature rewinds, or an average of 135,000 miles per rewind. During the same period, modern motors of the GE-200, GE-203, GE-258, GE-264, West.-506, West.-508, West.-532 and West.-632 types were operated a total of 144,000,000 motor-miles with only 524 rewinds. Most of these later motors had been in service for periods varying from five to ten years, but showed more than double the mileage per rewind of the older designs. Troubles from field, bearing, brush-holder and commutator lead failures showed still more favorable records for the more modern designs of both manufacturers. The very light, low-wheel, high-speed motors used on light-weight single-truck and double-truck cars were operated 12,400,000 motor-miles during the year 1924 with only seven armature rewinds. The average age of these machines, which included GE-258, GE-264 and West.-508 equipments, was about 4½ years.

Another example of the savings that are made by modern equipment and modern maintenance methods was given. In this case, on a large Eastern property the mechanical department spent an average of $1,420,000 annually on the maintenance of car equipment during the years 1918, 1919 and 1920. After a large part of the rolling stock had been replaced with modern cars, and the inspection and maintenance methods and facilities had been modernized, the average expenditure during the years 1923 and 1924 was reduced to $835,000. Mr. Thirl-

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wall testified that the equipment on this particular property was in much better and more reliable condition than when the larger maintenance expenditures were being made.

Better Bus Regulation Needed

Recent transportation legislation in the territory embraced by the Mid-West Association was discussed by O. Q. Claflin, chief attorney Kansas City, Kaw Valley & Western Railway. As important recent legislation of this type had been enacted in the state of Kansas, he explained some of the features of the bus regulatory law recently passed in that state. He said that preliminary work on a measure of this kind had been started two years before, and that during the last session of the Kansas Legislature no less than five different bills were introduced. One of these was finally passed, but Mr. Claflin contended that this was far from a satisfactory measure. He objected particularly to the method provided in the new law for fixing the tax on buses, and maintained that a ton-mile tax is the only proper and fair method of apportioning a fair part of the cost of road maintenance on buses in proportion to their use of the roads.

During the legislative session there was a general sentiment in favor of the passage of some sort of bus regulatory measure. Several different methods of fixing the tax rate were proposed. These included both a vehicle unit rate and a seat capacity basis. Instead of the ton-mile tax, however, a modified unit rate varying from $40 to $230 per bus per annum, depending on capacity, was adopted.

Under the new law, Mr. Claflin explained, the function of the commission will be primarily the issuance of certificates of convenience and necessity. All bus carriers operating at a given time specified in the act will be presumed to be convenient and necessary unless proved to be otherwise by evidence submitted to the commission. In regard to convenience and necessity, Mr. Claflin said, there will probably be some difficulty in determining how inland towns previously without transportation may be served by buses without competing with existing rail lines over certain parts of their routes.

In the preparation of evidence before the commission looking to the elimination of destructive competition, he advocated greater stress on the subject of the character of service now rendered by electric railway lines, and advised against laying so much stress on the damage done to railway receipts by the bus competition. He said that the adequacy of existing service must be established to prevent the issuance of a certificate.

Due to the unfair advantage which is given to buses by allowing them to use the highways at low cost, he said that the Kaw Valley line is considering asking the next Kansas Legislature to pass a law giving the commission the right to maintain the present railway right-of-way, and to allow the company to furnish rail transportation at a rate of 1 cent per mile one way or 1¾ cents per mile for the round trip.

All of the papers presented during the meeting were discussed from many angles, and the subject of legislation received particular attention. R. B. Campbell, general manager Arkansas Valley Interurban Railway, agreed with Mr. Claflin that the ton-mile tax basis is more scientific than a flat vehicle rate, but called attention to the fact that even this method of apportioning road maintenance cost eliminates the factor of speed. He said that at a conference of electric railway operators, held to consider the legislative program, some had advocated a gross receipts tax in preference to other methods. In Kansas, the ton-mile tax was considered to be more complicated than a flat rate, and consequently more expensive of collection.

Mr. Campbell maintained that the regulatory features of the bus law are of more importance than the matter of taxes. He held that inclusion of the requirement for establishing both convenience and necessity is an important provision in the new measure from the standpoint of protecting existing rail facilities.

Mr. Campbell explained the action which is being taken by the rail and bus companies with which he is connected for testing the new law and establishing a precedent under its provisions. As president of the Arkansas Valley Transportation Company, a bus operating organization which is competing with the existing rail line of which he is general manager, an application has been filed for a certificate of convenience and necessity. As an official of the Arkansas Valley Interurban Railway he is opposing the granting of this certificate on the grounds that the service now rendered by the rail line answers all the reasonable requirements for public transportation in the territory served. Mr. Campbell explained that this proceeding is being instituted frankly before the commission with the expectation that the request for a certificate to compete with the rail line will be denied, thus establishing a precedent for the administration of the new act where proper service is now being rendered by rail lines in the state. Commenting further on Mr. Claflin's views, he maintained that it is important for evidence before the commission to show financial injury caused by bus competition, since such financial injury directly affects the ability of the existing road to render proper service in its territory. Mr. Campbell also said that it is difficult accurately to define common carriers under the terms of the new law, and that the possibility for many technical variations in this definition will require close study on the part of those interested in the enforcement of the measure. Mr. Claflin held, however, that the requirement for issuance of a certificate of convenience and necessity is not a cure for unfair competition between buses and rail lines. He maintained that the bus must be taxed an amount which will put it on a comparable economic basis with rail lines which maintain their rights-of-way, pointing out that only under these conditions will a true comparison of both the relative cost and convenience of the bus and the railway be possible and fair.

Mr. Buffe pointed out that one of the serious problems in obtaining constructive legislation is that of getting all railway interests to agree on a general program. He insisted that electric railway men should be the last to advocate restrictive taxes of any kind—on buses or anything else. Instead, he maintained that they should be united in advocating reduced taxes on existing transportation agencies and relief from such forms of indirect taxes as paving costs.

The status of bus regulation in Colorado was explained by Mr. Stenger. He said that under the Colorado law a certificate of convenience and necessity must be obtained by a bus line only if the proposed service is competitive to an existing rail line. In view of the constantly changing conditions and rapid development taking place in the use of the bus as a common carrier he felt that it is very difficult to foresee a proper bus legislative program, but expressed the conviction that, under any circumstances, the bus must pay its own way for the maintenance of the highways. Otherwise, he pointed out, we will be living on the cream of highway transportation facilities today and leaving only the skimmed milk—in the form of badly depreciated roads—for the next generations. He said that if the intercity bus can furnish a better service more economically than the interurban, it must inevitably displace the rail carrier. However, to avoid serious economic waste, the bus must assume its proper burden of road maintenance cost, and this must be done before the interurbans are badly crippled by economic favoritism to the bus. He advocated the principle of making the user pay for the maintenance and upkeep of the roads, as a sound, economic policy. As an illustration of the importance of the subject he said that one road in New York had been rebuilt four times while the bonds issued for the original construction were still unpaid. In England, he added, where some of the roads are much older than in this country, and where more experience has been obtained in the cost of their upkeep, the cost of road maintenance assessed against a Ford car is about $140 per year.

Similar frank discussion took place of all of the other papers that had been presented. At the annual banquet, held on Monday night, Judge Charles H. Mayer, general counsel St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., made a plea for co-operation among railway men in the attack on their many problems, and pointed out that such co-operation would inevitably develop a leader with the vision and courage to carry the transportation banner to economic victory.

The following officers and directors were elected for the ensuing year: President, R. B. Campbell; secretary, treasurer and general manager Arkansas Valley Interurban Railway; vice-president, A. E. Reynolds, vice-president and general manager Springfield Traction Company, Springfield, Mo.; secretary-treasurer, J. A. Weimer; executive committee, H. B. Cobban, F. G. Buffe, R. J. Lockwood, E. Stenger.

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Future of the Bus and the Electric Railway*

Present Indications Are that the Public Will Demand Bus Transportation in Every City of Considerable Size—For Best Results Such Service Should Be Operated by the Electric Railways and Co-ordinated with Their Service—Requirements in Bus Design Outlined

By F. G. Buffe
General Manager for the Receivers Kansas City Railways

YOU gentlemen are no longer in the street railway or the interurban business. You are transportation men engaged in moving passengers and freight. Instead of a one-price, one-item store we are entering the transportation department store business, where we won't have to turn away customers because our line is limited. From now on we are really going to merchandise tranportation.

The street railway industry has made a long and heartfelt study of the bus situation, although in some instances the study has been too long and procrastination has proved expensive.

There was a tendency a few years ago to take the position that the bus had no fixed place in urban transportation and a disposition to sidetrack bus propaganda. But the idea spread and as more installations were made, the fact was soon recognized that the bus was inevitable. There was some talk of feeder lines and auxiliary service, but the last twelve months have brought a revolutionary change in thought and practice. In a very short time there will be no city of importance that does not have bus transportation.

At the meeting of the executive committee of the American Electric Railway Association in Washington on Feb. 16 a broad policy regarding the motor bus was unanimously adopted. It accepts the bus from headlight to taillight and states the only proper attitude towards competition. It assures the public that the members of the association realize their duty to furnish good public service, and that whatever is essential to such service will be furnished by these recognized and regulated transportation agencies. It calls for uniform regulation, the lack of which today is one of the weak spots in the entire bus situation. It recognizes a liability for reasonable proportionate taxes and other public obligations.

From a strictly street railway viewpoint it is comforting of course to agree with the first statement of these principles, "that no medium has yet been developed which alone can take the place of the electric railway in moving large numbers of persons in the rush hours in cities," but times and methods change rapidly and the bus is developing so fast that in a short time this statement may need modification. Undoubtedly there is nothing yet that can practically or economically replace street cars for mass transportation, or that can supply a similar service at as low a rate of fare, or that can give the same universal transfer system.

It is not likely, in the very nature of things and as our modern cities are now constituted, that the bus will ever be permitted to assume such a task, but this does not detract from the fact that motor buses in London are moving more people than are surface lines, nor does it weaken the statement that motor buses are now being built which can consistently handle rush-hour business with a comparatively slight increase in the number of units, and with a very small percentage of the total capacity as a standing load permitted. However, for all general purposes there is no danger of anything supplanting the present system, and it just as well that we nail our flag to the mast and stand by the ship. The outstanding point is that street railway men have quit thinking in terms of street cars and have broadened their vision and their jobs so that they have become transportation organizations, ready and willing to furnish motor bus transportation in co-ordination with street railway service wherever there is a field or a reasonable demand for such facilities.

You can't put the bus in a side street in a neglected suburb and satisfy the public demand. The average citizen wants to see and use buses on downtown routes and on the principal streets of his town. He is demanding real bus transportation. He wants a bus when he wants it, and present indications are that he wants it in every city in this country, and unless the present transportation organizations give it to him he is going to find some one who will.

For one man who is really concerned with the economics of the transportation situation, there are thousands who think about it not at all and care less, as long as they have what they consider is the proper transportation service. Whether Dick Smith or Tom Jones or the railway company operates the bus lines is with them a matter of little concern.

The motor bus is no longer a theory, no longer a threat, no longer the dream of visionaries, no longer an instrument for adventurous souls with lots of nerve and little credit—it is here now, today, as a recognized, popularly acclaimed unit in the transportation scheme. As Boss Tweed once said, "If you can't lick 'em, join 'em," and the mourners' bench is crowded with hard boiled street railway men who are busy joining. I know, because I am one of the joiners. Any transition period is troublesome, vexatious, full of mistakes, and often economically wrong, but these things don't stop transition, which is another way of spelling progress.

Revolutionary methods are expensive but they can't be stopped. As street railway men we have felt sure that mass transportation from the standpoint of economy, from that of congestion, could best be handled by large, electrically propelled units on steel rails. That position has seemed sound. It doubtless is, but changes are rapid. It was only a few years ago that many were of the opinion that buses were expensive and unprofitable. Then they were rather drudgingly accepted as possibilities for feeders or limited auxiliary service. There was a brief period of experiment with the trackless trolley, and now in almost every city street railway men are talking buses, planning buses and buying buses.

It will perhaps be an interesting fact to many, as it was to me, that in London there are more motor buses in regular operation than there are surface or subway cars. London has a total of 4,800 motor buses as against 2,585 surface or underground cars. There are in addition a number of suburban tram systems and much suburban steam road traffic. Of the 2,691,000,000 passengers handled by buses, tramways and undergrounds, the buses carried 1,214,000,000, or more than 45 per cent of the total.†

While London does not have the private automobile congestion of our larger American cities, it would seen that the tremendous number of these vehicles and the large percentage of passengers handled by them would to some extent weaken the argument that mass transportation cannot be handled by any other vehicle than a street car. This percentage becomes larger when we compare the number of passengers transported by London buses as against the number carried by surface tramways. Last year the tramway systems in London transported 909,000,000 people against 1,214,000,000 for the buses.

There have been many verbal bricks thrown at bus manufacturers, some of them justified and some of them on general principles. Without doubt individuals selling buses have been guilty of muddying the waters. Some have financed competition; some have invaded fields in which they had no business. But my observation is that most of them want to be good and are anxious and willing to join forces with the electric transportation companies. There are always two sides to a story, and before we condemn we should get the facts. I have personally investigated several of these tales that float around and found that my impressions were wrong, my information faulty, and my conclusions at times at variance with the facts.

Several years ago the bus manufac-

*Abstract of paper presented at the annual meeting of the Mid-West Electric Railway Association, Kansas City, Mo., May 25-26.

†See ELECTRIC RAILWAY JOURNAL, Sept. 20, 1924, page 425.

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turer was in an uncomfortable position, and like Hamlet didn't know whether to suffer the slings of fortune or do something to end them. He had a plant, an organization and a good, marketable product. On every hand truck factories, fire engine factories, wagon factories, automobile factories, were going into the bus field. He was besieged by Tom, Dick and Harry for surveys, prices and help in establishing bus lines. Street railway men were hostile and were moving heaven and earth to stop the spread of the bus idea. The manufacturer who desired to co-operate and to work out transportation problems with the street railway companies saw competitors step in and take the business. He was between the devil and the deep sea. In one city he was in bed with the street railways and in another he couldn't eat in the same restaurant. So perhaps we shouldn't be too critical of the past two or three hectic years.

The wide-awake legitimate manufacturer realizes that electric transportation companies are his best customers. Their credit is good; the transportation problem of the cities is in their hands; and in the very nature of things competition is an impossibility in a business that is a natural monoply.

My personal opinion is that the slate should be wiped clean and that we should accept the broadminded, progressive bus manufacturer for what he earnestly desires to be, a friend. The scalawags and trimmers can soon be discovered and read out of the congregation. The company which encourages competition; which stirs up trouble; which finances dummies; which gives commissions and bonuses to politicians or others; which misrepresents facts; will be found out and will be a maverick without friends either in the street railway or the bus field.

Transportation, especially urban transportation, is a natural monoply except in the extremely large centers of population, and even in those it would be better if all transportation facilities were under one direction. From the very nature of the business competition in mass transportation facilities cannot continue. Due to rush-hour conditions, the single fare system, extensions of city areas and the consequent demand for service, the necessity of supporting non-paying lines in the development stage, all possible revenue is required to support the facilities necessary for a complete, city-wide transportation system.

The introduction of the motor bus has often resulted in competition, and unfortunately, the bus has been allowed to compete unfairly in being given the advantages of short hauls, heavy traffic density and escape from paving and tax burdens. Where such a condition continues the street railway will eventually be so crippled that it can no longer provide a uniform service at its present fare.

In the end the public pays the price of such costly experiments. There are numerous examples where heavy bonus prices have been paid by street companies in order to stop disastrous competition, and the interest charges on such investments must in the end be passed on to the public or lost by the investor.

Just what do we mean when we say co-ordinated transportation? Webster says co-ordinate means "Equal in or of the same rank, order or importance, not subordinate." Also, "To adjust; harmonize." So co-ordinated transportation would imply an adjustment of transportation facilities. It implies furnishing the service the public desires, not making one method subordinate to the other but fitting each type to its proper field so as to avoid duplication, and at the same time render a more efficient and a more desirable public service.

Before the advent of the automobile our cities developed along transportation arteries. But with the almost universal ownership of private transportation there has been a decided change in the method of growth. Wide areas have been developed away from car lines. New sections have been opened and in every city extensive boulevard systems afford transportation paths for thousands who drive their own cars.

It is this new field we must tap if we can. In planning our co-ordinated system we should utilize the boulevards and compete with our own car lines as little as possible. We should try not only to serve such unserved territory but to sell our wares to new customers and bring back our old ones.

There are, of course, dangers to be avoided, pitfalls that lie in wait, and attention should be called to them and our energies directed to avoiding them. Taxation, excessive extensions, universal transfers, low fares, car line competition, adverse legislation, must all be watched.

There is already a tendency on the part of public officials to burden this infant transportation with taxes, and unless stopped its extension and success will invite new attacks; city gasoline tax, state gasoline tax, street and highway taxes, war tax, city, county and state personal and property taxes, present an imposing and dangerous array. Reasonable taxation is right and proper, and bus transportation should shoulder its proper share of the public burden, but this is no excuse for the imposition of unreasonable taxation. It is unjust to base a tax upon the pavement wear of a 15,000-lb. double-deck bus running on 6-in. pneumatic tires, when 35,000-lb. sand trucks on solid tires are using the same pavements without tax.

Unwise extension of bus service is another peril that is all the more dangerous because it can be so readily sugar-coated. A new bus line requires nothing but the buses and a schedule. There will be pressure of a serious nature to open new territories, to run buses on car line streets, and unless restricted an otherwise profitable bus system can be throttled by such parasite lines.

The universal transfer and the low fare present another difficult problem. There can be no good reason for either in a co-ordinated system except in the case of feeder or crosstown service. The bus is not the successor to the street car nor should a ride be sold at the same fare. The street cars furnish the low-fare, rush-hour, universal transfer service. The bus is a different vehicle offering a different service and the price should be in accordance. Even where transfers are given for feeder service the differential should be maintained.

Car line competition must be watched. Bus lines should be laid out so as to draw from car lines as little as possible and to reach and attract a new class of patronage. The rush hour belongs to the cars. There should be no large investment in rush-hour buses in a co-ordinated system. But schedules should furnish a good all-day service that will attract the shopper and without endeavoring to handle the peak-load crowd that would necessitate a large investment in short-hour buses.

To my mind, a seat for every passenger at a commensurate rate of fare is the greatest bus appeal. I do not think the private automobile has taken our business so much because of noise and the other so-called drawbacks of street cars as on account of the rush-hour crowds and the standees. People do not like to be crowded or stepped on or over. No man likes to get a seat only to give it up to a woman, no matter how gallant he may be.

There is every reason to forecast that bus transportation is just in its infancy, and even the most optimistic will be surprised by the development of the next five years. Outside of replacements in congested centers and on heavy lines, it is highly probable that very little new track will be laid, and bus service once instituted will gradually take the place of many sections now served by street cars. The cost of a mile of paved double track is in excess of $100,000, enough to buy ten to twelve buses, which would give a six-minute headway on a 5-mile route. A street railway system has only about 20 per cent of its total investment in rolling stock, whereas a bus system has more than 90. Kansas City has approximately $40,000,000 invested in street railway facilities, and has 747 passenger cars, or an investment of more than $53,000 per car. Twelve hundred double-deck buses would provide a seat for every passenger that these 747 street cars carry seated and

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 10-12—Canadian Electric Railway Association, Montreal, Quebec.

June 16-19—Society of Automotive Engineers, White Sulphur Springs, West Virginia.

June 22-26—American Institute of Electrical Engineers, Saratoga Springs, N. Y.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

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standing, and the total investment would not be to exceed $15,000,000 in buses, shops and garages. To earn 7 per cent on the street car investment requires $3,700 a year per car, where an earning of $920 per bus per year will pay 7 per cent on the bus investment.

From the standpoint of the passenger a bus should be pleasing in appearance; provide a comfortable ride and be as safe as it is possible to make it. We are making a plea for more business and more riders, and are hopeful that the institution of bus service will attract riders from those now using their own private transportation. There is a psychological appeal through appearance and such details as seating, lighting, heating. The highest possible speed consistent with safe operation is not only necessary from the passenger viewpoint but also essential in the reduction of operating cost. The use of air is desirable in braking heavy units not only as a matter of safety, but in the relief to the operator from the fatigue incident to manually operated brakes. Air also permits interlocking safety features and air-operated doors, which not only make operation safer but increase speed and accelerate passenger movements. A low center of gravity and a correspondingly low step are important, as an insurance against the danger of turning over and for the comfort of passengers. A low center of gravity gives a feeling of stability, and low step heights are a large factor in preventing boarding or alighting accidents. Every attention should be paid to the passenger's comfort, which is influenced by the character of seats, the width of the aisles, the lights, ease of entrance and exit, floor and step heights, absence of body noise and vibration, ease of acceleration and retardation, etc.

From the operating standpoint economy is just as important as the public appeal. The margin between expense and income is small, and any tendency to increase operating cost would soon wipe out profits. A sturdy, dependable type of chassis is necessary; one that will require a minimum of repairs and maintenance expense. All parts should be accessible and so far as possible units should be interchangeable. The engine should be built for the service; should be designed for ease in taking down and should have a high torque and comparatively low speeds. It should be powerful enough for the service required.

There is no economy in a cheaply constructed, light bus that in a year or so will be requiring constant attention and high maintenance. A bus should be built for from 250,000 to 300,000 miles. In the life of such a bus the gasoline used will be more than the original cost of the bus, as will maintenance.

Speed is a large factor in economical operation, and due to frequent stops the maintenance of high scheduled speed in city transportation is extremely difficult.

The average bus makes from six to ten stops per mile and it is manifest, therefore, that the less time consumed in loading and unloading the greater the speed that can be maintained. Every facility should be provided to secure a rapid interchange of passengers. With comparatively narrow aisle and entrance, an air-operated exit door should be installed which will permit passengers to unload at the rear as others board the bus in front.

Double-deck buses should be designed for one-man, two-man operation, which can be secured through the use of air-operated doors and interlocking safety devices.

There is much to be said in favor of a steel body as against the wood construction now generally being used. Experience in street car building and operation has proved the advisability of steel. Such bodies are more substantial and are less noisy than wood. Their life is longer, and undoubtedly maintenance costs will be less. From the safety standpoint there cannot be any comparison.

The gas-electric drive has recently attracted much attention and several large installations are now being made. The electrical equipment consists of a generator directly connected to the motor, which supplies current to operate two electric motors directly connected by gears and pinions to the rear axle. This equipment can be installed on practically any type of chassis and many advantages are claimed for it. It is quieter, has a more simple control and provides a faster and smoother acceleration. The driver is relieved of the heavy labor of gear shifting, and there is no vibration or transmission noises. Less maintenance and greater fuel economy are claimed as a result of more uniform engine speed. Absence of skidding is also emphasized. The arguments against it are that it adds approximately 2,000 lb. to the weight and $1,800 to the cost of the bus.

There is now sufficient operating data to show that the bus is a very economically operated unit, averaging less than the cost of operating street cars. Single-deck operation, depending upon wages paid and the type of equipment, runs from 18 to 25 cents per mile. Double-deck buses can be operated with one man for from 25 to 28 cents per mile and with two men from 30 to 35 cents. These costs include all depreciation charges, overhead and insurance, and are conservative.

There are other favorable arguments for the bus in city operation, such as flexibility, curb loading, and unloading, and the ability to avoid traffic jams and blockades.

There is a large field for express bus service in our cities at a price of 25 cents or more, somewhere between the cost of an ordinary bus ride and a taxicab. There are many people who now drive their own automobiles who are willing to pay for comfort and speed, and such non-stop express service undoubtedly deserves serious consideration. This is a new and as yet practically untried field, but large cities with their widespread residence sections invite some better and faster transportation than the stop-to-stop service, and at the same time less expensive than the private car or the taxicab. Our job is to furnish transportation at a fair profit and meet the public demand and need, whatever it may be.

Factors in Track Construction and Maintenance Costs*

By R. H. Findley
Superintendent Track and Roadway
Omaha & Council Bluffs Street Railway, Omaha, Neb.

RIGID economy in the cost of operation of electric railroads has been so essential the last few years that many electric roads have taken advantage of the developments in construction methods and equipment made necessary by the increased cost of labor. Mechanical devices of all sorts, some almost human in their action, are now used in attempting to reduce cost of construction. Mechanical excavators, cranes, automatic buckets for handling bulky materials, pneumatic tools of all descriptions, dump cars, etc., are all in common use on the larger properties where the volume of work necessary makes their operation profitable.

These devices have effected large savings in cost of construction, in place of the old method of using large forces of laborers at prevailing rates of pay. Most other construction work in our cities has undergone a similar revolution. In this industrial age, an excavating machine rooting up pavement, etc., on a city street does the work of fifteen or twenty men. Likewise a truck will do the work of four teams and drivers. Concrete mixers of latest type are operated by five or six men with truck delivery of dry aggregates instead of 22 to 25 men as was formerly the custom. Pneumatic concrete breakers permit two men to do the work of six or eight in a day. Two men with unloading cranes will do the work of ten or twelve hand shovelers, and so on down the line. Considering the fact that some construction work is still of such a nature that a machine cannot be used to replace labor, it is probably true as a general average of all construction activities that the same volume of work is now done with from 35 per cent to 50 per cent fewer workmen than were used ten years ago.

The present laws restricting immigration are responsible in a great measure for this situation in the construction field. The falling off in immigration due to these limitations is about 1,000,000 per year, based on the pre-war rate of influx. This number of people distributed uniformly over the country would mean about 2,000 more immigrants per year into Omaha, or 3,500 more to Kansas City. It has been absolutely necessary, since the war, to overcome this labor deficiency. The only way to accomplish any great volume of work has been to use machinery

*Abstract of paper presented at the annual meeting Mid-West Electric Railway Association, Kansas City, Mo., May 25-26, 1925.

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as far as possible. In order to realize such economies the cost of equipment has created a high construction plant expense, due to interest, depreciation and repairs, which has considerably cut down the net apparent labor saved. Because of this plant expense, many of the devices now used would not be economical if common labor were as plentiful, cheap and efficient as in prewar times.

Selection of one or more of the very numerous types of track construction used today throughout the country, should be fundamentally based on the idea of reducing the track costs per passenger carried. Much can be said for each of the various types of construction, varying from the most rigid steel tie monolithic track to the very plainest types. Each has its advantages and disadvantages.

The widespread tendency toward the operation of lighter street cars should result in a material reduction in maintenance and depreciation of our track. Further application of alloy steels and other high-grade materials in car construction should bring still further weight reductions. However, a great reduction in the unsprung weight on present and future cars would be a boon to us maintenance of way men. The rigid rolling load over the rails is what causes us so much grief on both plain track and special trackwork construction.

In Omaha a little less than one-half of our present motor and truck weights is unsprung load. This, in our 900 type cars, is equivalent to a rigid load of 5,600 lb. per truck, or 11,200 lb. per car. In other words, about 27 per cent of the total dead weight of our older types of electric cars for city service is unsprung weight. In some of our two-motor equipment, this percentage is reduced to about 19 per cent. The ideal condition for a rolling load, in order to have the least destructive effect on the support, whether track or pavement, is to have it entirely supported by either springs or rubber. On the other hand the most destructive and damaging rolling loads, and the most noisy, are those which are carried on the rail with no spring support.

Much of the noise from rolling load operation is created from impact, or lack of flexibility. In order to reduce noise, and realize the most life from our track and special work, we should operate the lightest, the most flexible and resiliently supported cars possible. This would also add to the life of the car itself, particularly to the lighter bodies. We should get every pound of weight possible on good shock-absorbing springs.

You can rest a 2,000-lb. pile-driver hammer carefully on a concrete slab with no ill effect. However, if you pick the hammer up several inches and drop it on the concrete slab a number of times, you will break the slab. Pick it up likewise and drop it the same number of times on a properly designed spring bed above the concrete, and the effect of your blow is dissipated in the springs and not in the rigid concrete slab. The resulting effect on the slab of concrete will be only a small fraction of that produced by the rigid hammer blow. Rolling loads are an everyday application of such effects, which apply equally to the life of track or to paved roads. Surely great improvements can be made in equipment design which will eventually have the effect of greatly prolonging the life of the track, to say nothing of the other advantages to be obtained.

It is probably true that over 95 per cent of the wear and tear on track and special work is due to dead load weights only. Certainly and without question, great savings in maintenance of way can be made by reducing the work the track and special work must perform, by reducing these dead loads.

Such improvement in equipment would greatly prolong the service life of track, and consequently, permanent materials, so far as practicable, should be incorporated in the construction in order to resist depreciation through decay, etc. An extremely important element to be considered from this standpoint is the track tie. Long-lived tie support is the real objective in modern main line track design, whether paved or open construction. This may be obtained in several ways. Thirteen years ago our company used a batch of creosoted red oak ties in open track—treated with 2½ gal. of oil to the tie, of a commercial grade of creosoted oil perhaps 20 per cent raw tar adulteration. These ties are all in the track and will easily last twenty years. You can cut your average tie costs 30 per cent per year, through the use of a properly treated tie. This conclusion is gathered from our experience, and is based on an open track life of ten years for white oak, and includes 6 per cent compound interest on first cost in each case, over the periods of life.

The use of treated ties in paved track, particularly in a plain ballasted type, is also good insurance against what I have called depreciation through decay. Our oldest track of plain ballasted construction where treated ties were used is now twelve years old and in excellent shape. The ties, including the sapwood, are in almost perfect condition, as we have discovered from service pipe excavations, and from some joint repair work. This section furnishes from one to two-minute service during rush hours, cars weighing about 20 tons. Rail renewal will be easily accomplished on this section later on, through the use of tie plates and screw spikes.

Our experience has seemed to indicate that successful plain ballasted track construction in paved streets should include the use of well treated ties to insure against sapwood decay. Even though the heart wood of your tie remains sound, a spongy condition of the track will result if your sapwood deteriorates. In many paved streets where good sub-drainage exists, and where the soil is considered good for bearing, expensive ballast should not be necessary, providing there is a good tie under the track. There will be sufficient bearing support, particularly if lighter weight equipment is operated. Machine tamping has given us an improved method of compacting the materials under the tie. With a good concrete paving base, a successful track will result—even with just a thin blanket of surfacing material under the ties. The permanency of the tie is the basic foundation factor in track construction.

Reduction in track and roadway costs to the car rider should be further made by obtaining relief from paving costs. Many arguments pro and con have been made on the subject. We have found throughout the business district of our city that almost all the vehicular traffic is required to pass over the portion of the street paving paid for by our car riders. By actual traffic counts we found that practically every vehicle necessarily must drive on the tracks due to the parking system in vogue, as a result of which about 27 per cent of the street space is used for parking automobiles, while the street cars occupy only about 1½ per cent during the rush hours. It is manifestly unfair to the car rider to require him to pay interest on the investment in this pavement and also to provide a replacement fund to perpetuate it. Cheap transportation is so vital to the interests of any city, that this unfair burden should be removed from the car riders, as it certainly does not belong there today.

Many suggestions have been made as to plans for obtaining such relief. The main argument against assessing the track paving direct to the property owners is that in many cases, streets were paved wider, by reason of the fact that the railway was located therein. Again it is said that costs per square yard are slightly greater by reason of the fact that the lines exist in the street, and that our cars damage the pavement, etc.

On almost all types of city track construction, the railway must concrete its track to hold it in place—pending the arrival of the street paving contractor. This concrete is usually part of the paving support, and must be paved by the railway company when the track is built. In monolithic steel tie track, the concrete is both paving base and track support. The practicable way, no matter how the funds are raised, or where they come from, would be for the city engineering department to allow the same amount per square yard to the railway, for paving its space, as it allows the contractor for paving the sides of the street per square yard. Of course the construction of the railway paving, like the balance of the street, would be under strict supervision of the city engineers. The railway could in such cases pave with any good adaptable type of paving to be approved by the city engineer, in connection with the trackwork, as the railway might desire to use concrete, brick block, or granite, if there were asphalt paving proposed on the street. By this system the car rider would be required to pay the fixed charges on the difference in cost of the two paving types.

The trend of track costs has been downward since 1920, and I believe the downward trend in unit costs will continue gradually. Since the peak of 1920 we have realized an average yearly decline in unit track costs of about 3 per cent per year, although most of this decline took place in two years. Further alterations in types of construction should net additional savings in

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our investment costs. We should be extremely cautious, under present day conditions, in our expenditures on track, and feel our way carefully. The development of the private conveyance, and need for retrenchment outlines to us a different problem, and it may be that certain of our installations, such as outlying tracks in sparsely settled locations, may be abandoned. We cannot spend the money, at present costs, to rebuild and pave tracks over which very infrequent car service is being operated.

New Englanders Discuss Car Painting and A.E.R.A. Co-operative Committee Work

CAR PAINTING practice and a discussion of co-operative committee work in the American Electric Railway Association featured the New England Street Railway Club's May meeting, which was held on the afternoon and evening of the 28th at the Copley Plaza Hotel, Boston, Mass. Striking gains in shop efficiency were set forth during the afternoon session in a paper on "Modernizing Car Painting Practice," by H. T. Hurlock, engineer of equipment Eastern Massachusetts Street Railway, Boston. This paper will be published in an early issue of the ELECTRIC RAILWAY JOURNAL. Mr. Hurlock pointed out that by improved methods the number of revenue cars painted annually on his system has been increased from 34 per cent of the total cars operated in 1920 to 82 per cent in 1925, and that the man-hours required for painting a 40-ft. double-truck car have been cut from 340 in 1920 with hand labor to 90.9 in 1925 with spray and hand labor. An extended economic study of the subject formed an important part of this paper.

H. G. Noble, superintendent Everett shops, Boston Elevated Railway, read a paper on "Car Painting." This was followed by one on "Car Cleaning" by O. B. Johnson, inspector of car cleaning for the same company, which is abstracted elsewhere in this issue. Mr. Noble's paper will appear in a later issue.

In the discussion of the papers J. B. Crawford, Concord, N. H., stated that the Concord Electric Railway is changing the color of its cars from olive green to the orange used by the Boston Elevated and that two coats of body color and one coat of enamel are being applied. G. E. Pellissier, Holyoke Street Railway, emphasized the psychological impression that well-painted cars make upon the public from the standpoint of stimulating patronage and of accident reduction. In Holyoke a so-called "Non-Olio" liquid wax preparation purchased in California is used successfully to prevent dust and dirt sticking to the paint. No water is required, and the preparation has a preservative effect on the paint.

H. H. Hanson, manager Middlesex & Boston Street Railway, Newtonville, Mass., said that his company adheres mainly to the brush method of applying paint. It has lately been experimenting with lacquer, but finds that the time required to put on paint by the manufacturers' method and the loss of material incurred cost as much as the brush method. The company has used two colors on cars for the past five years, yellow enamel and bright red. This has given much satisfaction from the standpoint of visibility and selection of cars for territorial patronage, the difference in colors being most helpful to the traveling public. Both colors contribute to accident prevention.

W. C. Bolt, superintendent rolling stock and shops, Eastern Massachusetts Street Railway, briefly discussed open-air storage of cars in reply to an inquiry of G. C. Hecker of the American Electric Railway Association as to the advisability of such storage from the viewpoint of paint preservation. Mr. Bolt said that where a car is operated sixteen to eighteen hours a day it is of relatively small importance whether storage under cover is provided for the remaining hours. The cost of repainting is now comparatively small, and should be balanced in a practical case against the total cost of maintaining storage facilities, in order to decide upon the best policy. Frank A. Barbey, Boston, pointed out that the steam roads have gone through the problem of open-air versus covered storage and that little or no difference in cost has been discovered in favor of providing coverage.

H. E. Potter, Union Street Railway, New Bedford, Mass., said that on their road every car is cleaned nightly, car sweepers covering eight cars per night each. Every month a thorough cleaning is done. Rattan seats are effectively cleaned by a mixture composed of 2 gal. water, 4 oz. lye and 1 pint chloride of lime applied with an old water brush. After the seats are scrubbed and rinsed with water they are dried by turning on the electric heaters. The polish is brought back by the use of Old English wax and the luster is regained by rubbing with a woolen cloth. When interurban special cars are rented the seats are covered with canvas, which adds to their appearance, and the laundering cost is less than $1 per car.

CO-OPERATIVE COMMITTEE WORK OUTLINED

With the exception of an address upon "Business at Bat" by the Rev. Henry H. Crane, Malden, Mass., the evening session was devoted to talks upon the work of the co-operative committee on progress of the A.E.R.A. C. G. Hecker, New York, described this development and pointed out that 55 men constitute the national committee membership on management and co-operation and, with Mr. Wilde, spoke briefly of the general plan of intensive visits to operating properties to secure information on modern practice that will be incorporated in a handbook. All committees are asked to find out the extent to which properties visited are making use of association facilities as well as to discover good practices worthy of being passed on to the industry. Mr. Hecker closed with an account of the Grand Rapids car selection problem, referred in many details to the local public for help in determination from the angle of riding convenience.

F. B. Walker, chief engineer maintenance of way Eastern Massachusetts Street Railway, Boston, summarized the plans of the committee, and A. L. Hodges, Brooklyn City Railway, recounted various progressive practices of that company as a sample of the class of material the committees will seek in their field work.

Safety Practices in Brooklyn*

BY A. L. HODGES
Assistant Secretary Brooklyn City Railroad

WE BELIEVE the work conducted by our Employees' Safety Bureau in Brooklyn is of interest. This work is under the direction of a supervisor of safety and an assistant who meet regularly with 30 safety committees at the various shops and depots. Their activity has resulted in an increase of 67 per cent in the number of shops with 100 per cent safety records in the course of six months.

A butterfly type seat is used in the vestibules and across center exit doorways of the new type cars. When not in use the seat is folded like a book and dropped into a pocket. This design was brought about by requests from passengers to do away with the old-style seat which is hooked up or latched when not in use. Trainmen do not always get the legs under them properly, causing them to give way with passengers' weight.

The 335 new cars are designed so that all wiring is carried through the pier posts and behind the advertising card space by the use of special pressed-steel conduits and conduit fittings. The moldings and panels are made in sections so as to be removed easily.

This arrangement simplifies the wiring arrangement and makes for greater accessibility in repair work. It also eliminates the chances for short circuits due to water, etc., when such wiring is carried under the car floor.

These 335 cars are equipped also with a detachable or "demountable" vestible. These vestibles have double hood plate construction, the lower or sub hood plate extends from the vestible corner post to vestible corner post and is securely bolted to upper or main hood plate.

The vestible corner posts are in two pieces securely bolted. The forward part of each corner post and the two center vestible posts are tenoned into the sub hood plate and the rear parts of the corner posts into the main hood plate. Pocket castings are bolted to the crown piece into which the bottoms of the vestibule posts are fitted. All bolts are made readily accessible with the removal of a minimum amount of inside finish. These vestibules have been

*Abstract of address before New England Street Railway Club, Boston, Mass., May 28, 1925.

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set on a car and completely wired and fitted in one hour and 30 minutes.

A very great majority of our accidents are what are known as vestibule accidents, i.e., car collisions and car and vehicle collisions, front and rear end. The use of detachable vestibules permits a damaged car to be returned to service in a few hours instead of several days or weeks, depending, of course, on shop congestion, which is a serious question with us, all due to increased traffic conditions.

All of our schedules are plotted graphically before they are given over to the operating division. This enables us to correct errors in running time and to reduce the layover time at ends of line to a minimum.

By 9:30 o'clock each morning we have on our general manager's desk a graphic chart for each of the 68 individual lines comprising the Brooklyn surface system showing the receipts and time-table costs for the preceding day from midnight to midnight. This information is compiled by the night dispatcher at the surface depot and phoned to the transportation department dispatcher located in the main office building.

A set of such daily graphs for any given line over a period of months or years gives a very conclusive picture or prospectus of future traffic requirements.

Cross-section checks form another method used by us in establishing adequate service and proper distribution of short-line service and have proved a very successful method of arguing cases before legislative committees and regulatory bodies when attempts are made to compel the companies to extend their short-line service. These are made by taking checks simultaneously at various points along the line and establishing a 100 per cent loading point as well as the relative dropping off in riding to and from this 100 per cent point, and our schedules are then established to fit the needs as shown by such checks. The checks are made every 90 days or oftener if marked increases or decreases in daily riding, as shown by the daily receipt graphs, are noted.

In January we started an accident elimination contest by conducting meetings at our twelve surface depots. These meetings were addressed by our general manager, superintendent of surface transportation and the division superintendent.

It was pointed out to the men in graphic form just how the accidents of each type, on each line, were increasing, and also just what portion of each dollar in receipts was spent to pay for accident and injury claims. These pictures gave a comparison with the accidents of 1923 and 1924 and brought home vividly to each man the fact that more careful operation of his own car and anticipating the moves of the other fellow were essential to the reduction of accidents.

There were a total of 2,898 accidents on the Brooklyn Surface Lines in January, 2,197 in February, 1,958 in March and 2,212 in April, and these figures in themselves bespeak the value of the personal contact established at these meetings. In the matter of money expended the result has been most gratifying.

No reward has as yet been offered the men in this contest. The twelve depots are placed on a competitive basis, and each month a large card showing the standing is printed and distributed. The incentive thus established, to place their depot in first place on this graph, has been remarkable.

Car Cleaning Methods of Boston Elevated*

By O. B. Johnson
Inspector of Car Cleaning Boston Elevated Railway, Boston, Mass.

Officials of the Boston Elevated believe that car cleaning is essential to good repair and the keeping of the painted surface in good condition. The interiors of cars are cleaned daily. The floors, platforms and steps are sprinkled with disinfectant and the dirt from under seats, car sills and around fixtures is brought out where it can be reached with a broom or hand brush. This is then swept out with an ordinary broom. The interior of the car body and vestibule below the roof is dusted with an absorbent mop, with the exception of lamps, hand straps and window sills, which are wiped with a dry cloth.

Periodical cleaning is carried out once a month. At these times the entire interior finish of the car is washed with soap and water. Interior glass is cleaned at the same time and hand straps are disinfected by dipping in a jar of disinfectant. Upholstered cushions are cleaned by beating and curtains by wiping or brushing.

After every storm and at other times when necessary, the exterior of the car is washed all over below the roof. The team for exterior washing consists of a hose man and two brush men to rub. The hose man rinses after the rubbing. In this work it has been found necessary for the brush men to follow the hose closely, for if the surface has a chance to dry off the rubbing is less effective. When storage or other conditions prevent the use of the three-man washing team, a bucket and brush are used by a single man.

The painted exterior, together with signs, is washed with water and oil soap, using a sponge and brushes. Hunter signs, monitor and ventilator glass are cleaned once a month, by using soap, water, sponge and dry cloth. The outside of sign glasses requires more frequent cleaning during bad weather.

*Abstract of address before New England Street Railway Club, Boston, Mass., May 28, 1925.

Bus Regulation Arouses Lively Interest at Chicago

Control by I. C. C. of Interstate Operation Advocated at Mid-West Motor Transport Conference—Co-operation Will Prevent Needless Multiplication of Commissions—Economics of Bus Operation Discussed

Under the auspices of the National Automobile Chamber of Commerce, 200 representatives of the electric and steam railroads, the automotive and allied interests discussed transportation problems at the Mid-West Motor Transport Conference, Chicago, May 27 and 28. Keen interest was displayed in the subject of bus regulation.

Vesting power of regulation over interstate motor bus and truck operation in the Interstate Commerce Commission, which could redelegate that power to local agencies, was advocated by W. E. Dickinson, legal counsel Chicago, Rock Island & Pacific Railroad. The paper read was one which had been prepared by M. L. Bell, vice-president of the same company. Mr. Dickinson said in part:

"In view of the recent decisions of the Supreme Court holding that a state is without power to grant or withhold a certificate of convenience and necessity for the operation of a purely interstate highway carrier, it is probable that the next session of Congress will take some kind of action relative to this matter.

"Although overburdened with duties, isn't it better to intrust this regulation to the Interstate Commerce Commission than to create a new body whose views and duties and authority will perhaps conflict with those of the commission? As motor carrier problems are largely local, agents could be chosen to act for the Interstate Commerce Commission. Powers granted should be general, not too specific."

Mr. Dickinson was followed by Charles W. Chase, vice-president Chicago, Lake Shore & South Bend Railway, and president Gary Street Railway. An abstract of his address, "The Electric Railway and Highway Transport," will be found elsewhere in this issue.

Another speaker on the subject of regulation by the Interstate Commerce Commission was T. R. Dahl, vice-president the White Company. The position taken by Mr. Dahl was brought out in a paper he gave on "Is Regulation of Interstate Common Carriers Necessary?" This paper, which developed rather extended discussion, reviewed the action taken at meetings in Washington the week previous and urged congressional action giving limited powers to the Interstate Commerce Commission. The directors of the N.A.C.C., according to Mr. Dahl, would have the I.C.C. grant formal approval of certificates of public convenience and necessity. In case of disputes between the states the commission would act as a board of arbitration, but all other regulatory powers would be delegated to the state utility commissioners of the states where the operations were located. This solution,

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he believed, would overcome constitutional objections and still place control of essentially local operations in the state commissions.

The general counsel of the Chicago, North Shore & Milwaukee Railroad, Ralph Bradley, favored the legislation suggested by Mr. Dahl. Federal legislation should not require the payment of any fees to the federal government for investigation or for certifying operating rights, Mr. Bradley insisted. All taxation of the motor vehicles used by the carriers should be left to the states. Bus regulation is essential, he said. Otherwise there will be an absence of system and of regular schedules. Service will be duplicated, highways unnecessarily congested and fly-by-night operators will multiply. Unless rates are regulated, the industry will be in chaos, he held.

Speaking against the plan to have the I.C.C. give merely formal approval to certificates issued by the state commissions was Judge S. T. Bledsoe, general counsel Atchison, Topeka & Santa Fé Railroad. This plan, he said, would give no regulation at all. Congress cannot constitutionally delegate the power of regulating interstate commerce to the states. Once certificates are issued under such a plan it would be impossible to get adequate service or to regulate rates. The real test of regulation was, he declared, "Does the public interest require it?" This involves the present railroad carriers and their ability to perform a satisfactory service.

The motor bus, the motor truck, the railroads are all common carriers, he held, and as such should be regulated. There is no reason for intrastate regulation and not interstate regulation. It would not be necessary for motor applicants to go to Washington for hearings. The I.C.C. could designate state commissions as its agents to hear cases, or could send examiners to take the evidence. At present the states have power to regulate with regard to adequacy of service. This is as it should be, Judge Bledsoe pointed out. But when it comes to interstate rates, the states do not have jurisdiction.

The Field of the Motor Bus and Its Economics

In the motor bus session two subjects were taken up—"The Field of the Motor Bus" and "Economics of Motor Bus Operation." John A. Ritchie, president Chicago Motor Coach Company, was the principal speaker on the first subject. He said in part:

"Co-ordination is economically inevitable. The most noteworthy step in that direction was taken when the Interstate Commerce Commission was formed in 1887. Whatever its errors may have been, and however much and however reasonably its acts may have been criticised, there is probably no railroad executive of importance today who fails to see the value of co-ordination in such measure as the Interstate Commerce Commission has been able to effect.

"The establishment of state public utility commissions is another step in the same direction. But these are all governmental agencies and one cannot but feel that if we could voluntarily and effectively co-ordinate the efforts of our own national transportation organizations it would be far better than to see more public commissions established.

Multiplication of Commissions

"Already the number of commissions having certain powers over public transportation is legion. Already their decisions, not infrequently at cross-purposes, have mounted into many volumes, and added to the expense and embarrassment of trying to find out the way of legal safety in any proposed action.

"Would it not be the part of wisdom to anticipate further regulation and adjust the differences of opinion and interest among ourselves rather than be forced by public pressure to adjust them in ways which might not be either agreeable to us or to the most useful ends of society as a whole?"

One Speaker Defends Competition in Transportation

S. C. Hadden, Indiana Highway and Motor Association, Indianapolis, conveyed the impression that he believed in competition in transportation, although he said that he would be for co-ordination, when defined "as the greatest economical use of all transportation facilities." However, he would not agree that operation paralleling railway lines should be prevented. The final arbiter, the public, wants competition in transportation, he maintained.

In Minnesota, according to E. F. Zelle, president Minnesota Motor Bus Association, a plan of co-ordination of bus lines was inaugurated with the formation of the association some few years ago. With from 85 to 90 per cent of the bus operators of the state now in the association, respect is given to the other fellow's routes. Mr. Zelle said that equipment used was valued at $5,500,000, that the routes covered 8,600 miles.

H. B. Stowe, superintendent of automotive equipment Department of Street Railways, Detroit, told of the manner in which buses were being operated in connection with the trolleys there. The department is not making away with the old form of transportation but is taking advantage of the new. It does not believe that the bus manufacturers are trying to force the railways to use something they do not want. Continuing he said:

"Since its inception, the D.S.R. has been studying the traffic and transportation problems of Detroit. We have considered many units and devices for co-ordinated transportation, such as the trackless trolley, the motor bus, and subway dips for the downtown business section. The rapid advances in the design of the motor bus brought about its adoption by the D.S.R. as one of the units of its co-ordinated system. In July, 1924, we began our first motor coach operation on Belle Isle. Later in the year we purchased 50 single-deck coaches of the 21-passenger type, to be used as feeders to the street car lines, giving much needed extensions to the outlying sections of the city, which had no means of transportation. A subsidy plan is now being worked out in detail to insure the department against losses through the operation of these extensions. This form of subsidy represents a guarantee to the Department of Street Railways to assume losses that may be incurred beyond the cost of operation in some of these extensions, and that reimbursement to the department shall be guaranteed by interested business associations in the several districts into which the lines are extended. To date we have received several checks from the Delray Business Men's Association to cover the operating deficit of that particular extension.

The subject of economics of motor bus operation, as it applies to bus operations in and around Milwaukee by the Wisconsin Motor Bus Lines, was covered in a paper by H. A. Mullett, assistant general manager the Milwaukee Electric Railway & Light Company.

Mr. Mullett said that his company now had storage space for 600,000 gal. of gasoline. By purchasing when the market is right a considerable saving in operating costs could be made, he averred. It was his experience that accidents in connection with bus operation were less than with the trolleys. He advised operators to adhere to as few standards of equipment as necessary, to care for the different kinds of traffic.

Several speakers discussed the subject of economics of operation. J. M. Pogue, Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, told of his bus operation between Dayton and Columbus. It was started with seven-passenger touring cars and has since developed into a substantial service using 22-passenger sedan type vehicles, with a seat for every passenger. On week days the load factor runs between 55 and 60 per cent. On Saturdays and holidays it varies from 85 to 90 per cent, and some trips have to be double-headed.

One of the significant facts, he declared, is that the combined passenger traffic on both railway and bus exceeds that previously carried by the railway alone. It is believed that some of the private automobile traffic is being secured. Fares are based on 3 cents per mile, with a minimum charge of 25 cents, and it is a surprise, Mr. Pogue said, to see how many minimum fares are picked up.

One of the biggest economies in bus operation, said B. W. Arnold, superintendent of bus service Chicago, North Shore & Milwaukee Railroad, is to acquaint the public with the costs of operation. Legislators now think that the one "gold mine" left is the bus. Two bills are now before the Wisconsin Legislature dealing with the buses, one would require a certificate of convenience and necessity for operation, and the other would increase taxes 25 per cent.

One strange thing about the regulatory bill is that the independent operators who four years ago so strenuously opposed the passage of such a bill now are the strongest for it. The reason for this is that since the passage of a similar bill in Minnesota some 38 operators have come into Wisconsin and started operation, often in competition with other motor carriers. These carriers now are among the strongest boosters for the bill.

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Suburban operation of buses in co-ordinated service with electric railway cars was discussed by Bert Collett, general manager Chicago & West Towns Railway. This bus service connects the small western communities by north-side routes and eliminates roundabout riding on the company's cars.

The conference was honored by the presence of the Hon. W. M. Jardine, United States Secretary of Agriculture. In an address dealing partly with the work of his department and also with the influx of motor vehicles in this country, Secretary Jardine advocated the co-ordination of railroad, waterway and highway transportation. The purpose should be, he said, to develop each form to its highest point of usefulness without taking from another the functions which the other could perform to the better advantage of the public. We may help the motor vehicle to find its place by wise restraint of its more enthusiastic proponents and by refraining from regulation which may have a crippling effect. Traffic surveys made by the department in six widely separated states show there is no basis for the belief that the motor truck will compete seriously with the railroads, according to Secretary Jardine. The truck has found its place in the short haul and is not taking over any business that the railroads can do as well or better.

Sweeping changes in the way that the public will travel, and the revolution in the method of shipping goods were predicted by A. J. Brosseau, president Mack Trucks, Inc., in discussing the relation of highway transport to other transportation agencies at the opening session, Wednesday, May 27. Private passenger cars, motor buses and motor trucks serve not alone the public but the other and older transportation agencies as well, he declared. How to employ these instruments to the best advantage of all is the task which confronts operators.

Significance of Subsidized Bus Competition*

BY CHARLES W. CHASE

Vice-President Chicago, Lake Shore & South Bend Railway, and President Gary Street Railway

THE main problem of the electric railways is to provide transportation for the people during some four hours of the day. The electric railways carry some 44,000,000 passengers per day and at least 20,000,000 must be taken to their destinations in four hours or at the rate of about 5,000,000 per hour. This is the real problem of the electric railways and I am convinced that there is no way of handling it except through the use of rapid transit trains, either elevated or subway, and large capacity surface cars.

The place of the bus, therefore, is not in competition with electric cars in carrying the rush-hour crowds. It seems to me it is in extending needed transportation service into territory where the home development is not sufficient to warrant the laying of rails and the stringing of wires. The bus also fits in supplying service to residential sections that do not now have rail service and which may not want noisy street cars operated on their streets.

The gravest menace to the street railway today is the highly subsidized motor bus competition, well organized and aided by abundant capital. Such a venture carries little risk and a good chance of quick profits. If the street railway of a community be unfortunate enough to have encouraged the displeasure of the political administration, it is a simple matter for persons, even unknown and untried in the transportation industry, to acquire a competing franchise. Then there are motor bus manufacturers who will advance against this franchise practically all of the capital necessary in the shape of buses. They will organize and supervise the business. The enterprise will start, planting its service along profitable routes of the street railway, preceding that service by sufficient time to secure the patronage and leave the railway to do the drudgery of all the unprofitable and pioneering service which the development of the community may require. In all, an economic waste and sheer duplication of service.

An instance, not far from Chicago, exhibits the strange spectacle of a city granting a 25 year franchise to such a competing motor bus service covering all of its streets and prohibiting by regulatory ordinances all competition from other buses and jitneys and even operation by the street railway itself of any protective motor bus service. This bus company is permitted to charge a 10-cent fare while the street railway is damned because with an 8-cent cash and 7-cent ticket fare it will not spend hundreds of thousands of dollars for street improvements, producing not a nickel of return to itself. It is true that the franchise requires the payment of 3 per cent of the gross receipts of the bus business to the city, but this must be expended in the maintenance of the streets used by the motor buses —an insignificant consideration for use, otherwise free of charge, of the enormous investment of the public in its streets.

This highly subsidized business—subsidized both as to free use of the public property and greatly increased rate of fare—can only succeed when the political and public psychology of the situation presents a fertile field for such a venture. But too many such situations do exist in our cities or can be easily engendered. It behooves us of the street railway industry, therefore, to be vigilant to maintain to the best of our ability sound public relations—thereby protecting ourselves from such forays. Constant efforts to study and meet the public desires and needs as to transportation and a spirit of accommodation will accomplish this, as has been abundantly demonstrated in many cities; even in one contiguous to the city first mentioned and in which the street railway and the city have been working hand in hand for complete and unified street railway and motor bus service, with the buses serving as feeders to the street railway lines and doing the pioneering transportation work in the thinly settled suburbs and parts of the city.

Would it not be better and productive of greater and more lasting returns, I wish to ask the motor bus manufacturer, for him to encourage, aid and protect by co-operative effort the street railway in its desire to extend and modernize its service by the use of motor buses as feeders, and do the pioneering transportation work, than to aid or countenance the questionable efforts of irresponsible persons to profit by the misfortunes of a particular street railway and to deprive it of its business by instituting a competitive and highly subsidized system of transportation, which assuredly cannot be of lasting tenure of life and must present an unstable foundation for profitable business relations with the manufacturer of motor buses?

*Abstract of a paper presented at the Mid-West Motor Transport Conference, Chicago, May 27.

Bus Session at Automotive Meeting June 18

THE morning of the third day of the four-day session of the Society of Automotive Engineers at White Sulphur Springs, West Va., June 16 to 19, will be devoted to discussion of gasoline-electric buses and rail car design. On the morning of June 18 H. S. Baldwin, General Electric Company, will read a paper on "An Electric Drive for Gasoline Buses."

American Association News

Special Reports Available

THE following special reports have been prepared and are available to member companies in good standing upon request:

Bulletin No. 26. Motor Bus Decisions. A summary of court and commission decisions made under existing laws involving motor vehicle common carriers, both passenger and freight, covering such subjects as jurisdiction and powers of commission, issuance of certificates of convenience and necessity, abandonment, extension or modification of routes, service requirements, etc., preceded by an analytical index making possible ready access to decisions on all phases of motor vehicle operation.

Bulletin No. 27. Traffic Ratios—1924. Part I, City Lines. This is a tabulation of ratios and comparative unit figures derived from the operating reports of electric railways in 1924. The cities are grouped according to their size, and there is shown in each city the riding habit, the average speed, revenue passengers and car-miles per mile of track, per car operated, revenue per mile of track, operating ratio, passengers per car-mile, proportion of transfer passengers and operating income per mile of track.

Bulletin No. 28. Traffic Ratios—1924. Part II, Interurban Lines. A tabulation of data for interurban lines similar to that given in bulletin No. 27 for the city lines. For the interurban lines the data includes the average speed, revenue passengers per car-mile, per mile of track, per car operated, operating ratio, revenue per mile of track, and operating income per mile of track.

Bulletin No. 29. Motor Bus Operations in the United States, Part V. This is the fifth installment of a list of motor bus lines, the first part of which was issued Dec. 1, 1924. It shows the name and address of all motor bus operators, and where the information is available, statistical data on the character of their operations. The present installment covers the states of Alabama and Oregon.

In addition to the above supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies, Bulletin No. 30, have also been prepared, bringing them down to date.

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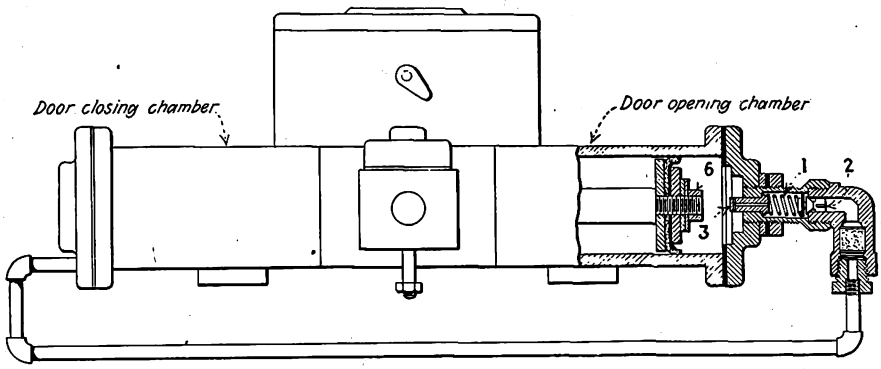
Maintenance of Equipment

By-Pass for Door Engines

WHEN the closing movement of an air-operated door is stopped pressure builds up in the closing chamber in certain types of door engine, so that when the door is released it will slam. Should the door movement be interrupted through a passenger being caught, this increased pressure prevents withdrawal and may result in injury. To insure that the closing pressure will not become excessive, a by-pass safety valve is being installed on cars of the New York State Railways, which have air-operated doors with door engines. This arrangement was devised by H. S. Sweet, engineer of equipment for the railway.



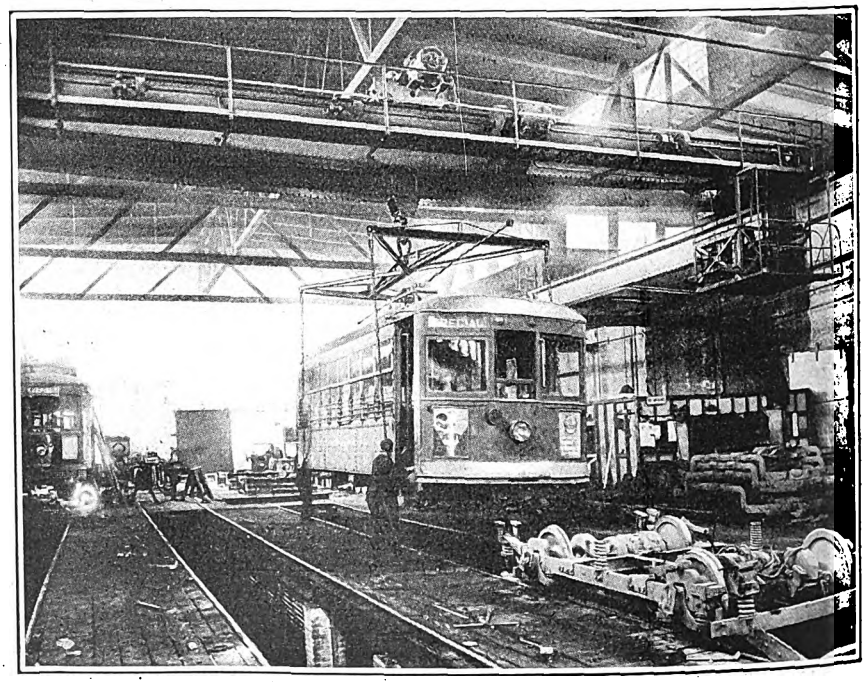
This By-Pass Safety Valve Used on Door Engines on New York State Railways Prevents Slamming

In arranging door engines for use with the by-pass safety valve, a new head is installed on the door-engine opening chamber and the by-pass mechanism attached at this end with a pipe connection to the door-closing chamber. The device, together with the necessary piping, is shown in an accompanying illustration. With this attachment installed, if a person is caught between the jamb and the door while it is closing, pressure will build up in the door-closing side of the engine until it has reached the pressure for which the spring No. 1 has been set. On the New York State Railways this is about 35 lb. Any greater pressure will cause valve No. 2 to open against the spring pressure. Air from the door-closing side of the engine will then flow through valve 2 and port 3 into the door-opening cylinder, which is connected to atmosphere for the closing operation. The pressure of 35 lb. is small enough so that a person can readily be released as the door can be shoved back against this pressure easily. Also, after the movement of the door is allowed to continue, it closes at its normal speed, since excess pressure in the closing chamber does not result.

When the door has once closed, the mechanism also provides that full pressure on the door-closing cylinder is applied to prevent the door from being forced open. In closing, nut No. 6 on the piston presses against valve stem No. 3. This increases the tension of spring No. 1 sufficiently to prevent the door being forced open while in the closed position.

Sling Used to Raise Birney Car Body

LIGHTWEIGHT safety car bodies are raised from their trucks in the Campello shops of the Eastern Massachusetts Street Railway, Brockton, Mass., by an arrangement of a sling and chains as shown in the accompanying illustration. A 5-in. T-rail is the central member of the framework of the sling. Diagonal members crossing at the center are 2¼-in.x3-in. angles. These are separated at their ends by 4¼-in.x2¾-in. angles. At the four corners of the sling are chains which pass under the car body. The shop is equipped with a Niles overhead traveling crane, which has ample capacity to raise the sling after it has been adjusted to a car body. In order to remove a car from its truck it is necessary only to attach the sling and pick it up with the crane. The truck can then be pushed out and the car body lowered onto supports.



Overhead Crane in the Campello Shop of the Eastern Massachusetts Street Railway Picks Up Light-Weight Car Bodies from Their Trucks

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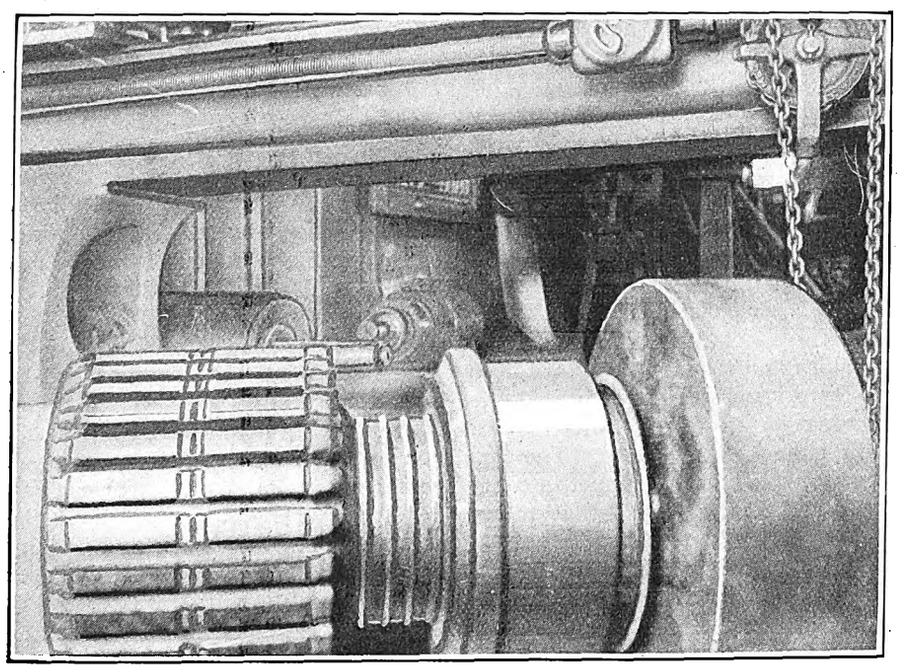
Installing Commutator Segments in Railway Shop

ON THE Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., it is the practice, whenever possible, to install new segments in worn commutators rather than to buy entirely new commutators or send them to manufacturers for repairs. It very often happens that most of the segments are in good condition and that only six or eight need replacement. New segments are purchased from the manufacturer and installed in the company's shop. How this has been done on the armature for a Westinghouse 510 motor is shown in an accompanying illustration. Six new segments are marked in white. To make repairs a couple of turns of wire are wrapped tightly around the commutator, after which it is removed carefully from the shaft and the new segments are installed at the bench. High segments are turned down in a lathe after the commutator has been reinstalled on the armature shaft. The winding is done in the spare time of a shop man when not occupied with other duties. It is thought by the management that this method has considerably reduced the cost of commutator repairs.



New Segments (Marked in White) Installed on Westinghouse No. 510 Armature Save Buying New Commutator

The following is an outline of a method recommended by the Westinghouse company for doing this class of work. The operations are given in the order in which they should be followed:

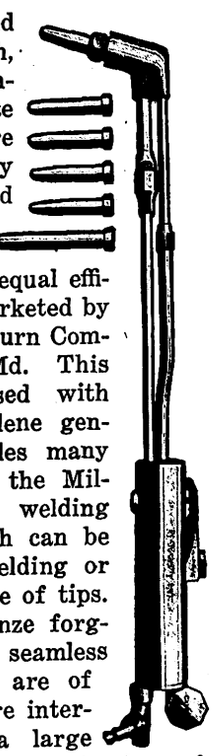
1. Fit the front metal V-ring over the metal bushing, or spider. It may be necessary to do some filing to obtain the proper clearance.
2. Fit the ring nut on the bushing. It may be necessary to clean out the threads on the bushing and nut to allow ring nut to be screwed up by hand.
3. With the front V-ring placed over the bushing and the ring nut screwed up tight, check the clearance of the front V-ring over the nut by lifting it up against the under side of the nut.
4. If it is a bolted type of commutator, the same procedure as indicated should be followed.
5. Dismantle the metal parts and scrape off all the paint and dirt. This applies especially to the V's.
6. Clean out the V's in the assembled copper segments, using fine sandpaper. Thoroughly blow out all dust and dirt and check for short circuits, using 500 volts between bars. After testing, brush the inside of the V's with a very thin coat of clean shellac.
7. Thoroughly clean the mica V rings, especially at the fit of the V, using fine sandpaper.
8. Assemble all parts and draw up ring nut as tight as possible while cold.
9. Cut off the temporary band wires holding the segments together, and further tighten up the ring nut.
10. Check for the alignment of the center line of commutator bar or mica (as given on commutator drawing) with respect to the center line of the keyway in the bushing.
11. Heat the commutator to a temperature of from 125 to 150 deg. C. and press while hot at from 20 to 30 tons, depending upon its size.
12. While hot and under pressure, further tighten up on the ring nut, after which remove the assembled commutator from the press to cool.
13. When cold, check for short circuits, using 500 volts between bars.
14. Check for grounds, using 4,000 volts alternating current if possible.
15. Press onto the armature spider, or shaft, and true up the face and neck.
16. After soldering, undercut the mica approximately $\frac{3}{64}$ in. deep.

The following points should be considered:

1. Use a good reliable make of mica insulation. Some grades look good on the surface, but are built up with an inferior bond which allows the pieces of mica to squeeze out under pressure. With this grade of mica it is often impossible to use these parts again.
2. Tighten commutator under pressure while hot.
3. If an oven is not available, it is preferable to heat the commutator on the inside, using a gas ring.
4. In tightening the ring nut, use a wrench rather than a hammer and chisel, as these destroy the nut.
5. If for any reason the commutator segments have to be removed after the bands are cut, a three-part clamping ring can be used to hold them together.
6. Do not fail to keep the commutator undercut, $\frac{3}{64}$ in. maximum; $\frac{1}{64}$ in. minimum; the front V ring clean and well painted; the commutator free from oil; the rear of commutator sealed from dirt and moisture; the commutator tight; the face of commutator smooth; the neck full width; the mica extending $\frac{1}{16}$ in. at rear, and segments free from grounds and short circuits.

New Equipment Available

Combination Low and High Pressure Torch



A CUTTING and welding torch, especially constructed to operate with low pressure acetylene gas, city gas or hydrogen and which will operate on high-pressure gas with equal efficiency, is being marketed by the Alexander Milburn Company, Baltimore, Md. This torch can be used with low-pressure acetylene generators and includes many standard parts of the Milburn cutting and welding torches. The torch can be used for either welding or cutting by a change of tips. It is made of bronze forgings and special seamless tubing. The tips are of solid copper and are interchangeable with a large number of low-pressure torches of other makes.

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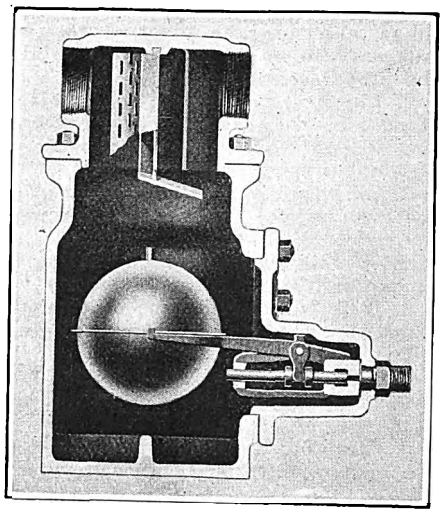
Starting Switch for Shop Motors

FOR controlling a.c. shop motors of not more than 10 hp., the Electric Controller & Manfacturing Company, Cleveland, Ohio, has placed on the market a push button operated starting switch. The contacts are oil-immersed and close the circuit directly across the line. The switch is arranged for wall mounting and is housed in a pressed-steel case with removable top cover. The contactor and overload mechanism is mounted on a slate base fastened to the case. The oil tank for immersing the main and overload contacts is suspended from the case by slotted spring clips. These permit the tank to be lowered part way for inspection and adjustment of the contacts. The operating coil is mounted on the core and is front-connected.

The new starting switch, called type ZO, has an expansion wire type of inverse time element overload device, used by the manufacturer on other starters. Current in the wires causes them to expand until a certain temperature is reached, when the contacts trip. If a momentary overload occurs, the wires begin to lengthen at once. If the overload goes off before the wires have lengthened enough to trip the contacts, they quickly return to their normal-load length. The overload device is adjustable. It is inserted during both starting and running. The time element characteristic makes it possible to protect the motor for the continuous running current and also for the higher current during acceleration. In case the motor does not start, due to abnormal load conditions or to the loss of one phase, the overload device will function so as to open the circuit in less than five seconds from the time the contacts are closed.

Removing Water from Air Lines

WATER in compressed air is a source of trouble in all electric railway shops. It cakes the sand and chokes the feed in sandblasting machines. It spoils air-brush painting. It slows down the operation of air-operated tools and causes rapid wear and rusting of parts. Water collects in pockets in piping and loosens pipe scale, rust and dirt from the inside of pipes, which form a further source of annoyance and trouble. In cold climates freezing



Valve for Separating and Automatically Discharging Water from Air Lines

results. To separate and discharge the water from air lines automatically, a device known as "Dri Air" has been placed on the market by the New Jersey Meter Company, Plainfield, N. J.

This device is arranged for installation at any convenient point in the compressed air line and is recommended at inlets and outlets particularly. Separation of the water from the air is effected by the use of baffles and traps such as are used in steam separators. This includes a reduction in the velocity of air and a change in direction. The construction provides a channel to carry and direct the water so that it can be automatically removed.

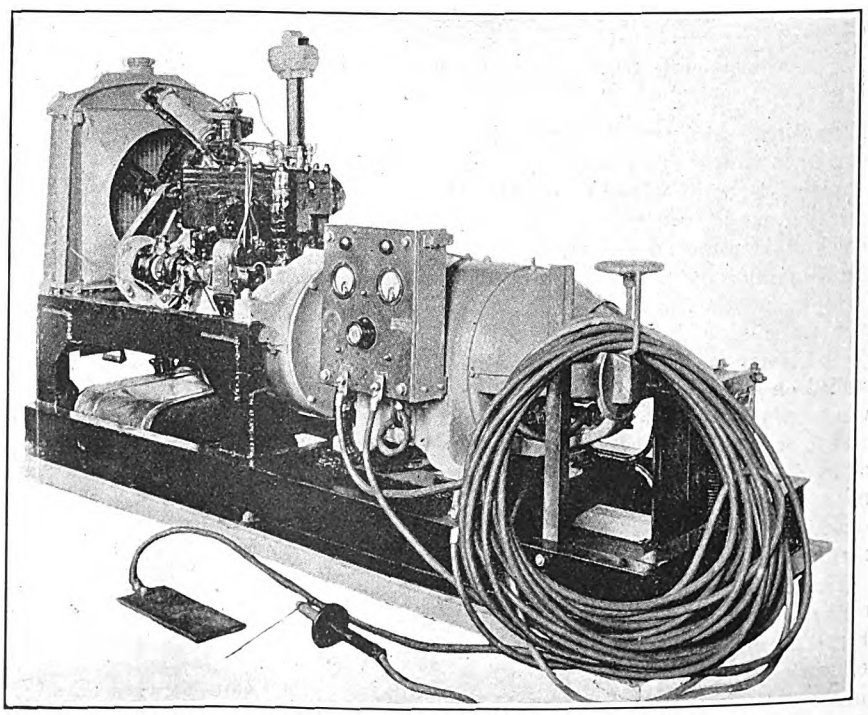
The device is drained by means of a float-operated valve as fast as the water collects. This eliminates the necessity of having a man go around at intervals to open drain valves. The separator and water trap are combined into one fitting. The discharge valve is operated by means of a self-baling and non-collapsible copper float. As the float does not need to withstand a high collapsing pressure, it is light and powerful enough to operate a valve with large openings and high lift, giving a large discharge capacity. Internal parts are of bronze or copper to eliminate corrosion. The discharge valve is so located as to guard it from grit and dirt.

Engine-Driven Welding Set

AN ENGINE-DRIVEN welding set which consists of a standard WD-12 welding generator driven by a Buda engine, all mounted on wooden skids to facilitate moving from place to place, has recently been added to the General Electric line.

The engine is a Buda model WTU, especially designed for heavy duty. It is a four-cylinder, four-cycle machine of "L"-head type, with 3¾-in. bore and 5½-in. stroke. The S.A.E. rating is 22.5 hp., and at 1,400 r.p.m. the actual brake-horsepower is 33.

The new outfit is being marketed complete with all accessories and ready for use. This unit should be of value in repair work and on any construction job where electric power is not readily available.



Welding Generator Driven by Gas Engine

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The News of the Industry

Oakland Report Filed

Hearing on July 2 to Consider Suggestions Contained in Report of Engineers

Engineers have completed the traffic survey of the traction division of the Key System Transit Company, Oakland, Cal., and have filed their report. They recommend a comprehensive loop system and rerouting in the downtown section of Oakland designed to relieve existing congestion and speed up traffic.

A decrease in the number of stops between Oakland and other points in the East Bay has also been recommended, together with changes in equipment and the installation of a traffic bureau to continue the joint survey.

The survey was started in January, 1924, when the Key System Transit Company engaged the services of Richard Sachse, consulting engineer. On learning of this the city of Oakland asked permission to join in the survey. This request was readily granted. It was also suggested that the State Railroad Commission co-operate in this matter.

The commission was willing to do this, but to secure its official participation it was necessary to have the city of Oakland file a formal complaint citing the need of a joint survey.

Shortly after the survey started the company agreed to make any changes recommended without awaiting the completion of the task of the engineers. As a result new bus lines were installed in districts now without adequate transportation. Additional cross-town bus lines were also put into operation.

New Loops and downtown rerouting recommended by the engineers in their survey will mean the expenditure of about $85,000 for new construction and about $30,000 for reconstruction.

One hundred cars of the traction division were found to be unsatisfactory for rebuilding and the engineers recommended that 30 new cars be purchased immediately and that about 30 more be bought each year until the obsolete equipment is replaced.

It was further recommended that stops be spaced as nearly as practicable eight to the mile instead of about thirteen to the mile at present. Still further to speed up Berkeley-Oakland traffic it was recommended that Shattuck Avenue be used for semi-rapid transit service with a maximum of six stops to the mile between the main business sections of the two cities. A non-stop bus service was also suggested as an alternative plan. The surveyors, however, pointed out that the proposed revision in the number of stops will speed up service 20 per cent.

These recommendations were brought before the State Railroad Commission on May 28 for action.

The Oakland Chamber of Commerce announced that its engineers had not had sufficient time to study the report and requested an adjournment until July 2. This was granted by Commissioner Clyde L. Seavey.

After the contents of the survey had been made public President C. O. G. Miller of the Key System Transit Company said in part:

As some people have misunderstood this situation and have consequently laid importance upon this investment of $85,000 new capital, we beg to mention that the annual report of the company for 1924 shows a total expenditure in roadbed and equipment exceeding $1,085,000 that year—the first of operation under the present administration.

The committee has recommended the purchase of 100 new cars over a period of three years, 30 cars to be ordered upon the approval of the report. This will add approximately $450,000 to the company's capital expenditures during the coming year.

The company expects to go forward with this despite totally inadequate returns on its investment, but in doing this it seeks the help and co-operation of all the communities it serves. The Railroad Commission has the report of the engineers under advisement and whatever recommendations contained in the report are approved by the commission will be put into effect as rapidly as possible following the granting of the necessary permits by the city of Oakland.

Five-Cent Fare Plan Scotched

Hylan's Transportation Board Finds Five-Cent Fare Plan for New Transit Lines Impossible Without Heavy Assessment Against Realty—Report Regarded as Robbing Mayor of Sole Issue in Coming Fight

IN A lengthy report made public on May 29 the Board of Transportation of New York City warned the Board of Estimate that it will be impossible to finance the construction of Mayor Hylan's comprehensive municipal subway system and operate it on the basis of a 5-cent fare unless an assessment of approximately $325,445,000 is levied against private real estate in the city. The total cost of the subways is estimated at $542,915,000.

The Board of Transportation further stated that if Mayor Hylan and the Board of Estimate adopted this plan, which appeared to be the only feasible 5-cent fare plan available, the total of $325,445,000 should be so divided that $138,445,000 would be levied in direct assessments against the owners of real property in the areas benefited by the proposed subways and $187,000,000 would be levied against the real property of the city at large. The latter sum would be provided for in the budget and collected in the form of taxes over a period of eight years.

The actual route of the proposed Hylan subway system is 57 miles, with an actual trackage of 170 miles. This latter figure is the result of the total trackage for two-way and express service over the various routes.

TAXATION HARDSHIP LIKELY

The Transportation Board, consisting of John H. Delaney, chairman; Daniel L. Ryan and William A. DeFord, all of them appointees of Mayor Hylan, has based its report on the presumption that the entire Hylan subway system would be built. The board points out, in commenting on the assessment method of financing this system, that the alternative of financing the construction through bonds would be equivalent to operation of the lines at an 8-cent fare.

Furthermore, the report points out the almost utter impossibility of financing the new subways by 50-year bond issue because the borrowing capacity of the city will not permit it unless all other public improvements, including new schools, ordinarily financed by 50-year bonds, are completely abandoned during the next five years. This would result in a taxation pressure as early as 1928 more distressing than the present transit situation.

The law fixes a 5-cent fare for the first three years of operation and a self-supporting fare after that period.

To do this, the report points out, it will be necessary partly to finance the subway out of the budget and partly by property value assessments. Here is the case in a nutshell:

The estimated cost of construction and equipment of the proposed new subways, prior to beginning of operation, is $506,765,000.

All that the returns from a 5-cent fare could take care of in the way of paying interest and amortization on 50-year bonds, after paying operating costs and depreciation, would be $243,000,000, and any outstanding indebtedness in excess of that sum would have to be financed otherwise. It amounts to this:

The subways can take care of, on a 5-cent fare basis, an indebtedness of	$243,000,000
Leaving a balance to be handled otherwise of.....	263,765,000
This would be divided as follows:	
Out of taxation	110,000,000
By property assessments..	138,445,000

It would be necessary also to provide for about $77,000,000 additional expense for new equipment after the fourth year out of taxation, and to levy additional property assessments as required for expenses which are sure to arise.

Chairman Delaney insists that the short term serial bonds to be included in the budget would not increase taxa-

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tion. They would be issued in series to be paid off in the next eight years.

As for the plan of levying assessments against properties benefited by the new subways, Chairman Delaney cannot see any objection to it. He points out that property owners have volunteered in some parts of the city to pay the entire cost of construction of subway lines abutting their holdings. The board has the power to assess any part of or all the cost of subways upon benefited property.

Experience has shown, according to the report, that financing the entire project by 50-year bonds would add about 15 per cent to the cost of construction. The following conclusion is reached after an exhaustive presentation of the proposition from all angles:

> The rate of fare for each passenger can be permanently maintained at 5 cents if all the capital required during the construction period in excess of $214,700,000 be provided by issuance of short term serial bonds and a moderate assessment on property directly benefited by the new lines. By this method of financing the interest charges during construction will be approximately $40,000,000 less than if the whole project is financed by issuance of 50-year bonds. When the interest charges are included the total investment under this plan would be $542,915,000.

The capital invested under each plan would be approximately as follows:

FIVE-CENT FARE PLAN	
Cost of construction and equipment for initial operation	$506,765,000
Cost of money prior to initial operation	36,150,000
Capital investment at beginning of operation	$542,915,000
EIGHT-CENT FARE PLAN (FIFTY-YEAR BONDS)	
Cost of construction and equipment for initial operation	$506,765,000
Cost of money prior to initial operation	76,015,000
Capital investment at beginning of operation	$582,780,000

The report says the capital with which to finance the construction and equipment of the new system in a manner that will permanently establish a 5-cent rate of fare can be obtained from the following sources:

Sale of fifty-year bonds	$214,470,000
Sale of serial bonds maturing in annual instalments during the next eight years	187,000,000
Assessment upon property benefited in the areas contiguous to the new lines	138,445,000
Already provided in budget of 1925	3,000,000
Total capital necessary	$542,915,000

The report says this plan appears to be wholly practicable in its apportionments. The report is accompanied by a detailed exhibition of costs of construction and operation of twenty-seven different sections of the proposed lines embracing 170 miles of single track, of which five, extending up Central Park West from 64th Street and out into Washington Heights, have already been authorized by the Board of Estimate. Approval is asked for the twenty-two lines not already validated.

Chairman Delaney suggests that the city might save $25,000,000 original cost of a power plant and the interest on the investment by purchasing power from a contractor.

H. U. Wallace Succeeds Ross Schram

H. U. Wallace, general manager of the Knoxville Power & Light Company, Knoxville, Tenn., has been appointed general manager of the Department of Street Railways at Detroit, Mich., succeeding Ross Schram. Announcement to this effect was received by wire from Detroit at 5:30 p.m. on Friday, June 5, just as the issue of the ELECTRIC RAILWAY JOURNAL for June 6 was being put to press. The telegram contained no facts other than the statement of the change.

"Is Arbitration Arbitrable?" Question at Boston

The Boston Elevated Railway, Boston, Mass., and its union men are in flat disagreement. Recently, the company proposed a change in the existing method of arbitration by which the company has chosen one arbiter, the men another, and these two a third. The men rejected this proposal.

The public trustees in charge of the elevated have now made public a letter signed by James F. Jackson, chairman of the elevated trustees, in which it is stated that the trustees declined to acquiesce in the attitude of the union men. The trustees, in their statement, suggest that each party name its own representative and the selection of the third, or "neutral" member, be left to the Governor of the commonwealth. The company has already named Roland W. Boyden as its representative, and the men attorney James H. Vahey, on the assumption, their representatives say, that the two men thus named were to name the third, or "neutral" man, and the board consider only disputed questions on which they have not been able to agree in negotiation, but not the method of arbitration, as they assert they are perfectly satisfied with the method in operation between the parties for the last thirteen years. The parties for the last thirteen years.

Wages Reduced in Sioux City

Because of falling revenues, the Sioux City Service Company has announced a reduction in the wage scale of its employees of 6 cents an hour, effective June 1. This change reduces the pay of the majority of the men to 50 cents an hour from 56 cents an hour. First year men will receive 45 cents an hour, second year men 47 cents an hour and third year men 50 cents an hour. Overtime work will be paid for at the rate of time and a half. For classes of labor other than trainmen, a reduction of 6 cents an hour will be in effect. The men are demanding an increase of 6 cents an hour more. No further retrenchment was possible without impairing the service to the public.

Pay-as-You-Leave Experiment at Oakland

An experiment with the pay-as-you-leave system will be made by the Key System Transit Company on its College Avenue line, between Oakland and Berkeley, Cal., beginning June 10.

Under this plan passengers will board both front and rear doors of cars on outbound trips and leave by the rear door, paying their fares as they pass the fare box. On the inbound trips, from Berkeley toward Oakland, the regular pay-as-you-enter system will be used.

Twenty-Mile Road Makes Record

All the rolling stock owned by the Lehigh Traction Company, Hazleton, Pa., was in operation from early Saturday morning, May 30, until early Sunday morning. Not one failure was reported. All of the men reported for work and no delays took place.

Up to June 1 returns had not been completed, but indications were that 43,000 fares were collected, this including passes, transfers, metal tickets and cash. In other words, this 20-mile line was asked to carry 125 per cent more people on May 30 than it carries on any regular day in the year. Best of all, the feat was accomplished successfully.

Approximately 19,500 people visited Hazel Park.

Claims Desired Fare Will Meet Expenses

O. S. Johnson, vice-president of the Plattsburgh Traction Company, appeared before Public Service Commissioner Voorhis on May 27 in support of the company's petition for consent to increase the fare to 10 cents, with sale of three tokens for a quarter. He informed the commissioner that the Common Council of Plattsburgh had unanimously consented to the increase.

Mr. Johnson submitted figures to show the deficits encountered by the road in the last few years, while it was owned by the Delaware & Hudson Company. The company decided to abandon the property in March and it was bought by Messrs. Johnson and O'Brien to save it from being scrapped and to give the people of the city transportation. Mr. Johnson stated that with the proposed fare it was expected the road would about pay operating expenses, without any return on the investment. It is proposed that the 10-cent fare should apply to the entire line, but that tokens would be accepted within the city limits.

Portland Council Will Consider New Franchise

Franchises to run seven years under which the Portland Electric Power Company, Portland, Ore., will operate railway and bus lines to portions of the city not now served will be considered by the City Council shortly. The franchises have been completed after weeks of work on the part of John M. Mann, Commissioner of Public Utilities, and F. I. Fuller, vice-president of the electric company. Fares are to be fixed by the Public Service Commission.

The bus franchise provides that every bus shall have a capacity of at least fifteen persons and shall be operated at least every 30 minutes. Franchise fees for the bus lines will be $1 a seat a year and a flat annual fee of $10. Transfers must be provided between the bus lines and the railway lines and from the car lines to the bus lines.

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Recent Bus Developments

Detroit Proposes Unusual Test—Union Street Railway Seeks Bus Monopoly—Experiment in Montreal—Activity Reflected in Other Cities

THE Union Street Railway, operating railway and bus lines at New Bedford, has bought the Interstate Bus Line and Providence Touring Company, which have been operating buses connecting New Bedford, Fall River and Providence. The railway is seeking to clear this field of bus competition and to have the rights of its own interstate bus line extended so as to do business between New Bedford and Fall River. It has filed a petition with the Massachusetts Public Utilities Department for authority to parallel its trolley line from New Bedford to Fall River with a bus line, so as to give the people a choice of service. H. H. Crapo, president, says that the people demand a bus service and if they cannot get it from the railway they will get it in some other way.

The petition is opposed by the Eastern Massachusetts Street Railway on the ground that the two railways have a joint operating agreement out of which the Eastern Massachusetts gets a sum of about $60,000 a year. Fred Cummings, vice-president of the Eastern Massachusetts, and Philip G. Carleton, attorney for the company, argue that if the Union is allowed to supplement the railway with a bus line it will cut down the service over the trolley line and to that extent impair the income of the Eastern Massachusetts, while all the profit from the bus line will go to the Union Street Railway.

President Crapo admits that the new move will hurt the Eastern Massachusetts financially, but replies that such fate is inevitable in the development of the bus.

The New Orleans Public Service, Inc., New Orleans, La., has added two more bus lines to serve as feeders to the railway in the thinly settled sections of the city. The Commission Council of New Orleans has given it a franchise to operate a bus line on Canal Boulevard between City Park and Taylor Avenues, a distance of eight-tenths of a mile, and also a franchise to operate a bus line for a distance of 2 miles in Gemtilly Avenue. The establishment of several other bus lines is in contemplation.

The first proposal of the People's Motor Bus Company of St. Louis, Mo., to co-ordinate its service with the cars of the United Railways was made at a meeting of the St. Louis Board of Public Service on May 26.

Richard W. Meade, president and general manager of the bus company, in opposing a permit to the St. Louis Bus Company, a subsidiary of the United Railways, to operate buses over DeBaliviere Avenue to the Municipal Theater in Forest Park, said that his company was willing to give the opera patrons who visit the theater during the twelve weeks beginning May 25 unified service by furnishing a transfer to the street cars on payment of a 10-cent fare, or to furnish service on the buses exclusively for 3 cents between the theater and DeBaliviere Avenue. The latter plan would enable street car patrons to ride on the cars for the customary 7-cent fare and then take a bus to the theater for an extra 3 cents. Mr. Meade contended that this plan would do away with such congestion as would undoubtedly be caused by competing buses and would give the public maximum service.

The Interstate Public Service Company started a parlor car bus service between Indianapolis and Louisville on May 20. This run parallels and supplements the service given by the same company with electric railway cars. It is made with a fleet of five Fageol parlor cars. Although the Interstate has operated buses between Indianapolis and Franklin and between Indianapolis and Seymour, and also between Scottsburg and Louisville, until now these routes were not connected. The new service is in addition to the local service. The fare is the same as on the railway, namely, $3.50, one way.

The Oklahoma Corporation Commission refused to grant an application for operation of a passenger bus line between Oklahoma City and Norman on May 12, holding that the present interurban service given by the Oklahoma Railway fully meets the demands of the public between these points. The commission also refused to grant application for a passenger motor bus certificate to operate from Oklahoma City to Cushing, holding that the service given by the Missouri, Kansas & Texas and Sante Fé railroads between these towns is sufficient.

Col. J. E. Hutcheson, vice-president and general manager of the Montreal Tramways, Montreal, Que., has announced that a supplementary bus service will be tried out in Montreal within the next three months. The Montreal Tramways Commission and the Montreal Tramways have been studying the subject for a long time. Colonel Hutcheson said that among the difficulties which the bus would encounter in Montreal were the narrow streets, steep grades, sharp curves and heavy precipitation of snow. The company is prepared to start tentatively a bus service from Sherbrooke Street west to Pine Avenue that will provide accommodation for those wishing to visit the hospital and for those who prefer a bus to a tramcar. The company is also giving consideration to the operation of a bus service between Verdun and the corner of Atwater and St. Catherine Streets as soon as the streets of this route are put in good condition.

Application for routes and rates has been filed with the Minnesota Railroad and Warehouse Commission, under the new state law, by the Mesaba Railway Coach Company of Virginia, Minn., and the Northland Transportation Company, Duluth. Incidentally a $250,000 deal is revealed by which the Mesaba company took over the routes of the Range Rapid Transit Company between Virginia and Eveleth, Eveleth and Leonidas and Aurora and Hibbing. The Northland bought the Rapid Transit Company routes from Duluth to Virginia and Virginia to International Falls, effective on June 1. The owners of the Mesaba company operate trolley cars along the Iron Range of the Mesaba Electric Railway and will adjust bus routes and cards so that the two services will alternate every half hour. The Range Rapid Transit Company is a pioneer in bus operation on the Mesaba range.

The Denver & Interurban, (Kite Route) Railroad, operating between Denver and Boulder, Colo., 30 miles, has asked for permission to operate a bus line between these cities and all intermediate points. The new service would compete with its own electric line and the Colorado & Southern Railroad, which owns the Kite. The Kite sets forth that its receipts are diminishing and that unless the loss is offset the railway cars may be taken out of service. Many applications from outsiders for the privilege of operating buses over this route, have been refused because of the fact that it would take too much revenue from the rail lines.

Detroit Proposes Unusual Test

AS A RESULT of a proposal by Ross Schram, general manager of the Department of Street Railways at Detroit, to the Mayor's Committee on Transportation the municipal electric railway and the Detroit Motorbus Company will cooperate in a test to discover how well motor buses can handle mass transportation. Mr. Schram has proposed that the department remove its cars from Woodward Avenue, which cuts the heart of the business district and has the Ford Highland Park plant at the other end, and that the Detroit Motorbus Company take all of its equipment for service on Woodward Avenue.

It is Mr. Schram's opinion there is no more beneficial clinic to be held in transportation than a test of this kind. Volumes and volumes are being written pro and con on "Motor Car vs. Trolley." Mr. Schram's own staff has given endless attention and thought to the matter. To him there seems to be no answer except actually to make the test.

This proposal has the approval of the Mayor's Transportation Committee, the Street Railway Commission, and the directors of the Detroit Motorbus Company. In this connection Mr. Schram has suggested to Mr. Storrs, managing director of the advisory council of the American Electric Railway Association, that it would be very appropriate for the association to participate by having at least four or five observers present to study the proposed operation.

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Barr Bill Lost

The Barr bill in the Illinois Senate, providing for indeterminate franchises, is apparently a dead issue. Senator Barr recently announced that he would not press the Legislature to act on the measure. The Barr bill and a rival measure were voted out of the Senate public utility committee.

Senator Barr said that the principle of his bill was not opposed but differences of the manner in which the permits will be issued and safeguarded made it unwise to press the issue at this time. He is working on a new measure to authorize a committee to visit other states and investigate their handling of utility problems with the purpose of recommending action at the next General Assembly.

The House committee has recommended the Durso bill. This measure provides for a transportation board in Chicago with home rule in traction matters.

Arbitration in New Orleans

Because negotiations which have been under way since May 1 looking toward a settlement of the wage to be paid trainmen of the New Orleans Public Service, Inc., New Orleans, La., for the year beginning July 1 have been unsuccessful, arbitration is to decide the issue. Francis Williams will be the arbitrator for the employees. The men have asked for an advance in wages of approximately 10 per cent. The agreement under which the men are working calls for a scale of 47 cents an hour for the first six months, 49 cents for the succeeding six months and 51 cents thereafter. The company, it is said, is seeking certain reductions.

One-Man Car Law Attacked

The Knoxville Power & Light Company, Knoxville, Tenn., has brought action in the Chancery Court attacking the constitutionality of the state law forbidding the operation of "one-man" cars. The suit was brought by Charles T. Cates. He says that at the time the legislature passed the act the Knoxville company had 51 one-man cars and had just bought sixteen new ones at a cost of $135,000. The measure is attacked principally on the ground that it contains an arbitrary classification in which cities under 30,000 population are exempted. It is contended that the operating costs of the Knoxville company will be increased at least $115,000 a year if it has to employ two men on every car. The law prohibiting one-man operation becomes operative on Oct. 16, 1925.

Arbitration Sought by Worcester and Springfield Men

Employees of the Springfield Street Railway and the Worcester Consolidated Street Railway on May 29 asked that differences respecting wages and working conditions be submitted to arbitration. They named James H. Vahey as their choice for representative on the board. The agreement under which the men have been working expired on June 1. The request for arbitration was presented in writing after several fruitless conferences had been held. The men ask for 80 cents an hour in place of 68 cents for uniformed men on two-man cars. The company proposed a reduction of pay, but has been especially insistent on a change in the working conditions, to include a wider range of hours in place of the existing eight-in-eleven spread. In the event of arbitration proceedings the company demands a board of five members instead of three as hitherto. The men filed their request for arbitration as the 60-day limit for such action was about to expire. All hope has not been abandoned of reaching an agreement by direct conferences between the parties. Another joint meeting will be held before papers are signed submitting the dispute to arbitration.

News Notes

Authorizes Fare Advance.—Authority to the Omaha-Council Bluffs Street Railway, Omaha, Neb., to boost its fare so as to provide an additional annual revenue, totaling between $300,000 and $350,000, has been granted by the Nebraska Railway Commission. Company officials predict an increase in fare from 7 cents or 4 tickets for 25 cents to a cash fare of 10 cents or 3 tickets for 25 cents.

P. R. T. Case Reopens July 1.—The Public Service Commission has fixed July 1 as the date for resuming the Philadelphia Rapid Transit Company's rate case in Philadelphia, Pa. The hearing will be resumed where testimony was suspended, the commission planning to hear several experts who could not be heard the last time the case was aired. Dr. Milo R. Maltbie, called into the case by the commission at the request of Governor Pinchot, will attend the hearing. Dr. Maltbie recently announced that a revaluation would be necessary for the commission to determine the proper fare rate.

Fares Lowered.—The Rockford & Interurban Railway, Rockford, Ill., recently put into effect reductions of nearly 20 per cent in its fares under authority of the State Commerce Commission. The reductions include round-trip fares on Saturday and Sunday. Fares on connecting lines will not be changed nor will fares in the suburban districts.

Service Changes Announced. — Since the discontinuance of service by the Charleston Isle of Palms Traction Company, Charleston, S. C., the railway on Sullivan's Island and also on Mount Pleasant has been operated by the Mount Pleasant Railway, which bought in the Charleston Isle of Palms property when it failed. As soon as the bridge across Cove Inlet is completed cars will be operated from the ferry wharf on Mount Pleasant through Sullivan's Island to Breach Inlet.

Dollar Pass to Popularize Cars.—The Pacific Gas & Electric Company has put the $1 pass into effect in Sacramento, Cal., in the hope of increasing earnings. For some years now the company has earned no return on the value fixed by the State Railroad Commission. The Merchants' Association has commended the action of the railway.

Fares Cut.—Summer schedules and rates of fare on the Cœur d'Alene and Opportunity-Vera lines of the Spokane & Eastern Railway & Power Company, Spokane, Wash., were arranged recently at a conference of traffic and operating heads presided over by Waldo G. Paine, vice-president and general manager. The new fare schedule provides for week-end rates to be good going on Friday, Saturday and Sunday instead of on Saturday and Sunday. The return limit will be good until Monday. A reduction in one-way fares of 20 per cent for parties of ten or more is announced. This will be effective on the lines of the Inland Empire Railway as well as the Spokane & Eastern.

Agreement Terminated. — The Spokane United Railways, Spokane, Wash., is now ending its three-year "gentlemen's agreement" with the city. This provided a 7-cent cash fare and 6-cent ticket rate. The present arrangement expires on July 1. No announcement has been made by the railway officials on the fare situation.

Councilmen Hard Put for Things to Criticise.—Arguments advanced by the Louisville Railway, Louisville, Ky., for some weeks past for a 7-cent straight fare, instead of five tickets for 30 cents have spurred the City Council to go over a report made by the City Utilities Bureau. Baffled to find any real reason for complaint against the company, the Councilmen have sought to attract attention to themselves by criticising expenditures made for traveling, attending conventions, supplying autos to officials. As for the buses operated by the Kentucky Carriers, Inc., it is sought to establish the principle that the losses sustained in their operation should not be charged to the barometer fund of the company.

Permit Given for Selling Merchandise.—The New York Transit Commission recently approved applications by the Interborough Rapid Transit Company, New York, N. Y., and the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., for permission to sell candy, gum and other merchandise in the city's newer subways. The privilege is expected to add about $150,000 a year to the revenues of each company. The action of the commission was taken under the provisions of the Nicoll-Clayton act, passed by the last Legislature and signed by Governor Smith. This eliminated from the rapid transit act the clause prohibiting the sale of anything but newspapers and the display of any advertising in the stations of the subways built under the dual contracts. The commission reserved the right of revocation and specified that vending might be carried on only under commission regulations.

Seek Increase—Reject Offer. — Employees of the Community Traction Company, Toledo, Ohio, have asked for an advance of 10 cents an hour. A counter-proposal of the company was that last year's wages be continued; this scale is 55 cents an hour for platform men on two-man cars and 60 cents an hour for the operators of one-man cars. The 1924 agreement with the company expired on June 1.

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Financial and Corporate

Creditors in St. Louis Decline Fifty per Cent Offer

Creditors of the United Railways, St. Louis, Mo., who received judgment against the company prior to its receivership but who have not yet been paid, declined on May 29 to accept a 50 per cent settlement offer tendered by the reorganization committee. The reorganizers, through their counsel, Stanley Clarke, offered to pay the old judgment holders 50 cents on the dollar for the face of their judgment and also 50 per cent of the accrued interest. This offer was submitted in writing to a committee of lawyers representing the various creditors. The question of filing intervening petitions in the United States District Court was also discussed at the meeting. It was finally decided to appoint a committee to call on the various judgment creditors to obtain subscriptions toward defraying the cost of filing an intervening petition. Damage judgments approximating $375,000 are pending against the old United Railways.

Spokane Power Station Sold

Sale of the Nine-Mile power station, located on the Spokane River below the city of Spokane, by the Spokane & Eastern Railway & Power Company to the Washington Water Power Company of Spokane was announced on May 27. The transaction is the second large sale made by the bondholders of the old "Inland" system in recent years in the policy of disposing of properties of the former light and power system. The city lines of the old "Inland" were merged with the city railway system of the Washington Water Power Company in 1922, out of which the Spokane United Railways was formed. The power station supplied a portion of the new "United" system and all of the interurban lines. It has 20,000 hp. installed, consisting of four 5,000 hp. generators. The Washington Water Power Company has entered into a long-time contract to supply the interurban lines. Of the former "Inland" system only the interurban line, extending from Spokane to Cœur d'Alene, Idaho and a line through the Palouse wheat district to Moscow, Idaho, now remain. It is understood that those lines will eventually be sold by the bondholders. for whom the Harris Saving & Trust Bank, Chicago, is trustee.

New York Railways Would Trade with Ninth Avenue Company

The New York Transit Commission held a hearing on May 20 on the New York Railways Corporation's application for permission to exchange $1,250,000 of its 6 per cent income bonds and 7,500 preferred shares of no par value for $3.000,000 in bonds of the Columbus & Ninth Avenue Railway. The holders of two-thirds of the bonds have agreed to the exchange, it was disclosed.

Commissioner John F. O'Ryan asked what would be the status of the owners of the remaining bonds if they did not agree to the exchange. He was informed that they would be total losers. Under the reorganization plan the bonds must be deposited on or before June 15.

The Columbus Avenue line runs from Fifty-ninth Street to 110th Street, New York City. It is regarded as an important link in the recently reorganized surface railway system. A group of bondholders, it was said, would be unlikely to agree to the reorganization plan because they would prefer to abandon the surface tracks and rely on the sale of their carhouse rights and duct franchise for reimbursement.

The replacement value of the Columbus Avenue railroad property, not including equipment, on Aug. 1, 1923, was estimated at $2,252,450 by Stone & Webster, engineers, at the hearing on the application of the New York Railways for permission to acquire the Columbus and Ninth Avenue line.

Reorganization Terms Announced for Kansas City

Bonded Indebtedness of Street Railway Is Slashed to an Initial Issue of $12,465,200 at 6 per Cent in a Reorganization Plan Made Public June 1—Old Stockholders Not to Participate

AFTER deliberations extending over a period of many months the terms have been announced under which it is proposed to carry out the reorganization of the Kansas City Railways. The details were made public on June 1. The holders of the old preferred and the common stocks will not participate. A problem that still remains unsettled is the extent of the participation, if any, of the second mortgage bondholders and of J. Ogden Armour, with a claim of $1,500,000 for moneys advanced prior to the receivership. Stripped of the verbiage of the official document the plan has been reduced to this statement of fact:

PROPOSED IMMEDIATE CAPITAL DISTRIBUTION

Bonds, $12,465,200.
Preferred stock, $8,336,400.
Common stock, 182,645 shares of no par value.
Provisions for capital expansion: The first issue of bonds is not to exceed $20,000,000, of which at least $5,000,000 is to be held for property additions. A "prior preferred stock" may be issued later, but not in the reorganization.
Annual interest charge on bonds, $747,912.
Annual dividend required on preferred stock, $583,348.
Annual interest and dividend payments to be satisfied before common stock could enjoy dividends, $1,331,260.
Annual interest before receivership, $1,422,370.
New money to be invested, none.
Cash in receivers' treasury to be acquired by reorganizers (estimated), $5,000,000.

DISPOSITION OF TREASURY CASH

Course of treasury balance, surplus arising from 7, 7½ and 8-cent fare over a period in which no interest has been paid.
Settlements with injury claimants and lawyers, $1,350,000.
For working capital, reorganization expense and improvements, $3,650,000.

PREVIOUS LINE-UP OF SECURITIES

Face value of bonds and notes held by first mortgage interests in old company, $25,067,400.
Face value of securities (bonds and preferred stock) to be held by same interests in new company. $20,801,600. (This includes $1,350,000 in bonds to apply on a compromise with damage claimants.)
And in addition 182,645 shares of common stock.
Low ebb value (three and one-half years ago) of securities held by first mortgage interests, $7,500,000.

INTERESTS TAKEN CARE OF IN REORGANIZATION PLAN

First mortgage bond and noteholders; injury litigants and lawyers.

Interests which spurned a compromise offer, but may still be taken into the reorganization: Second mortgage bondholders; J. Ogden Armour.

PROPOSED DISTRIBUTION OF NEW SECURITIES

To holders of old first mortgage 5 per cent bonds, for each $1,000 bond, $400 in new 6 per cent bonds, plus $300 in preferred stock, plus seven shares of common stock.
(Of above bonds outstanding, $15,917,400.)
To holders of 7 per cent collateral notes, for each $1,000 note, $521.60 in new 6 per cent bonds, plus $391.20 in preferred stock, plus 7.824 shares of preferred stock.
(Of above notes outstanding, $7,750,000.)
Other noteholders, representing $1,400,000, to share in about same proportion.
To damage suit lawyers and their clients, $1,350,000 in cash and an equal amount in new 6 per cent bonds.

The new plan is being submitted to individual first mortgage bondholders and to noteholders by the reorganization committee, Melvin A. Traylor, H. L. Stuart, George W. Davison, P. W. Goebel, and J. K. Newman, the latter virtually occupying the position of reorganization manager in recent months. The plan provides for $12,465,200 in bonds as against $16,433,400 in a tentative plan that was drafted about a year ago.

The plan made public on June 1 is tentative in that it must be preceded by a foreclosure sale of the property and possibly may require the approval of Judge Kimbrough Stone. Foreclosure of the property has been ordered by the court with jurisdiction in the case, but the date of sale has not been advertised.

MAY COMPROMISE ON SECOND MORTGAGE

The termination of the receivership and the reorganization of the property as indicated faces an obstacle, in time at least, in the hostility of the second mortgage bondholders and of J. Ogden Armour. The latter is willing to lose his stock investment, but is striving to recover some part of the $1,500,000 advanced in a vain effort to ward off a receivership. These interests rejected a proffered compromise. The plan specifically authorizes the reorganizers to terminate this legal controversy, if they desire. Authority is given to make a settlement, if deemed satis-

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factory, in bonds, stock or the proceeds of a sale of either. This may mean a further enlargement of the capital issue.

The plan gives the reorganization committee power to bring Kansas City business interests into a minority ownership of the property. For six months after the reorganization, the committee can sell 20 per cent or less of the stock of the company to employees or to residents of Greater Kansas City at a price to be fixed by the committee. Any bondholder, however, can withdraw his individual shares from participation in such sales.

$557,243 Profit at Seattle

Municipal Railway Operation in 1924 Results in Much Better Showing than Was Made in 1923—Statistics of Operation Unusually Complete

FIGURES of earnings of the Seattle Municipal Railway, Seattle, Wash., for 1924 show that the road did much better last year than it did in 1923. Net income in 1924 was $557,243, compared with $169,636 in 1923. The report was transmitted to the Mayor and the City Council on March 30, 1925, by D. W. Henderson, general superintendent of railways, but has just been made public in pamphlet form.

The report follows previous statements in its form. There is no running comment and except for the chronology the report is devoid of text to accompany the many tables of statistics that are included.

One thing appears quite certain. Seattle has at last hit upon a productive rate of fare. It is true that a campaign is on to stimulate riding, but under the 10-cent cash fare with three tokens for 25 cents the results have not been at all bad. Passenger revenue last year was $6,083,238, compared with $5,643,088 in 1923, and revenue per pay passenger went from 7.2780 cents in 1923 to 8.2387 in 1924.

Rates of Fare

Here is how Seattle has experimented with rates in the past:

May 9, 1914—Cash 5 cents; six tickets for 25 cents; 25 tickets for $1. Extra fare required on Lake Burien line outside city limits, or sixteen tickets for $1 good for full trip.

April 1, 1919—4⅓-cent and 6¼-cent tickets eliminated.

July 24, 1920—Cash fare, 10 cents. Token fare, 6¼ cents.

Jan. 9, 1921—Cash fare, 10 cents. Token fare, 8⅓ cents.

March 1, 1923—Cash fare, 5 cents. Transfers, 2 cents. Tokens, four for 25 cents good for fare with transfer.

INCOME STATEMENT, SEATTLE MUNICIPAL STREET RAILWAY

	1924	1923
Operating revenues	$6,119,290	$5,690,598
Operating expenses	4,807,538	4,716,106
Operating income	$1,311,752	$974,492
Miscellaneous revenue	54,616	813
Gross income	$1,366,368	$973,678
Deductions from gross income	809,124	804,042
Net income	$557,244	$169,636
Profit and Loss		
Losses accrued (other than income) current annual period		$11,527
Delayed losses accrued in prior periods:		
Cost of retiring plant	$12,642	
Plant retired—depreciation not fully accounted	184,463	
Additional cost of industrial insurance	613	
Adjustment of accounts receivable	777	
Material out of stores	229	198,726
		$210,253
Net income (profit and loss—1924)		369,430
		$579,683
Net income		557,243
Gains accrued (other than income) current annual period		2,602
Delayed gains accrued in prior periods		19,838
		$579,683

CONDENSED BALANCE SHEET OF SEATTLE MUNICIPAL STREET RAILWAY AS OF DEC. 31, 1924

Capital Assets	
Total capital assets	$13,893,167
Total redemption and special fund assets	648,609
Total current assets	1,144,503
Total deferred charges	67,813
Deficit—Dec. 31, 1924	615,928
	$16,370,022
Capital Liabilities	
Bonds outstanding:	
General lien bonds	$775,000
Utility revenue bonds	14,191,000
Total capital liabilities	$14,966,000
Redemption and Sinking Fund Liabilities	
Unmatured accrued interest on funded debt:	
General lien bonds	$7,812
Utility revenue bonds	236,683
	$244,495
Matured unpaid interest on funded debt	3,572
Depreciation reserve fund audited and approved claims payable	16,261
Matured unpaid bonds	450
Total redemption and sinking fund liabilities	$264,779
Current Liabilities	
Amounts payable by current (operating) fund to other funds:	
To general fund	$249,237
To Municipal Street Railway betterment fund	145,000
To Municipal Railway bond 1919 construction fund.	82,000
To railway department depreciation reserve fund.	90,000
	$566,237
Amounts reserved on contractor's estimates	4,290
Tokens outstanding	73,157
Audited and approved claims payable	254,850
Warrants outstanding	240,706
Total current liabilities	$1,139,242
	$16,370,022

STATISTICAL AND COMPARATIVE REPORT OF OPERATION OF THE SEATTLE MUNICIPAL STREET RAILWAY

	1924			1923		
Revenue—Operating	Amount	Per Car-Mile (Cts.)	Per Car-Hour (Cts.)	Amount	Per Car-Mile (Cts.)	Per Car Hour (Cts.)
Passenger car revenue	$6,043,981	37.08	343.29	$5,613,545	34.70	318.43
Special passenger car revenue	593	0	.03	651	0	.04
Automobile bus revenue	38,662	.24	2.20	29,543	.18	1.68
Municipal department passenger revenue	48,000	.29	2.73	48,000	.30	2.72
Freight revenue	29,621	.18	1.68	36,510	.23	2.07
Mail revenue	19,395	.13	1.10	17,643	.11	1.00
Miscellaneous transportation revenue	12	0	0	.....	.....	.....
Discounts and adjustments	*60,976*	*.37*	*3.46*	*55,295*	*.34*	*3.14*
Total operating revenue	$6,119,290	37.55	347.57	$5,690,598	35.18	322.80
Miscellaneous Revenues and Expenses						
General shops	*40,086*	*.25*	*2.28*	*38,162*	*.24*	*2.16*
Service equipment	*2,351*	*.01*	*.13*	*13,388*	*.08*	*.76*
Utility equipment	*182*	*0*	*.01*	*605*	*0*	*.03*
Electric current sold	946	.01	.05	464	0	.03
Rental of real estate and buildings	4,024	.02	.23	4,213	.03	.24
Rental of tracks and way facilities	23,892	.15	1.36	24,563	.15	1.37
Rental of transportation equipment	1,578	.01	.09	1,383	.01	.08
Station and car privileges	22,335	.13	1.27	18,162	.11	1.03
Lost and found department	*296*	*0*	*.02*	*207*	*0*	*.01*
Other miscellaneous revenue and expenses	1,840	.01	.10	2,763	.02	.16
Total miscellaneous revenue	11,699	.07	.66	813	0	.05
Total gross revenues	$6,130,989	37.62	348.23	$5,689,784	35.18	322.75
Summary of Operation						
Way and way structures	459,717	2.82	26.11	411,365	2.54	23.33
Conducting transportation	2,022,303	12.41	114.86	2,015,645	12.46	114.34
Maintenance of transportation equipment	455,935	2.80	25.90	387,492	2.40	21.98
Housing and hostling transportation equipment	206,294	1.27	11.72	185,308	1.15	10.51
Power	624,815	3.83	35.49	634,724	3.92	36.00
Commercial	53,472	.33	3.04	60,820	.38	3.45
General	299,885	1.84	17.03	335,636	2.07	19.04
Depreciation and amortization	685,114	4.20	38.91	685,114	4.24	38.87
Total operating expenses	$4,807,538	29.50	273.06	$4,716,106	29.16	267.52

INCOME STATEMENT

	Current Year Dr.	Current Year Cr.	Previous Year Dr.	Previous Year Cr.
Operating revenues	.....	$6,119,290	.....	$5,690,598
Operating expenses	$4,807,538	.....	$4,716,106	.....
Operating income	.....	1,311,751	.....	974,497
Miscellaneous revenues and expenses	.....	11,699	813	.....
Gross income	.....	1,323,450	.....	973,678
Deductions from gross income	766,207	.....	804,042	.....
Net income	.....	557,243	.....	169,636

PAYROLLS AND VACATIONS 1924

Transportation:	Payrolls	Cost of Vacations
Office, inspectors, station masters	$107,539	$3,705
Trainmen	1,977,672	78,164
Shops and carhouses	544,631	6,855
Way and structures	497,712	18,651
Accounting	86,238	3,585
Total	$3,213,794	$110,961

SEGREGATION OF PASSENGER CAR-HOURS AND CAR-MILES

	Car-Hours	Car-Miles
One-man single truck	176,253	1,375,666
One-man double truck	636,066	6,185,501
Two-man	884,737	8,235,147
Buses	43,542	414,720
Total	1,740,598	16,211,034

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OPERATING STATISTICS OF THE SEATTLE MUNICIPAL STREET RAILWAY

	1924	1923
Car-miles operated	15,883,567	15,867,104
Car-hours operated	1,717,052	1,730,174
Bus-miles operated	414,720	306,499
Bus-hours operated	43,542	32,725
Total car-miles	16,298,287	16,173,603
Total car-hours	1,760,594	1,762,899
Average speed	9.26	9.17
P. S. E. transfers	7,063	9,437
S. & R. V. transfers	882,738	799,233
Jitney transfers	414,798	334,390
Passengers at 2½ cents	2,151,501	2,009,082
Passengers at 3 cents	58,078	59,769
Passengers at 5 cents	0	20,416,895
Passengers at 6¼ cents	0	3,541,042
Passengers at 8¼ cents	66,060,792	47,311,552
Passengers at 10 cents	4,841,895	3,699,648
Total pay passengers	74,416,865	78,181,048
Deadheads	1,152,735	1,282,266
Transfers	18,697,374	18,500,376
Total passengers	94,266,974	97,963,690
Pay passengers per car-mile	4.5659	4.8339
Total passengers per car-mile	6.0570	5.7839
Total passengers per car-hour	53.5427	55.5697
Passenger revenue	$6,083,238.19	$5,643,088.51
Miscellaneous revenue	47,751.16	46,696.43
Gross revenue	6,130,989.35	5,689,784.94
Revenue per car-mile	0.376174	0.351794
Revenue per pay passenger	0.082387	0.072780
Revenue per total passenger	0.065039	0.058081
Expenses, including depreciation	$4,807,538.52	$4,716,106.54

June 16, 1923—Cash fare, 10 cents. Token fare, 8⅓ cents. Transfers free.

Total gross revenue in 1924 was $6,130,989, compared with $5,689,784 in 1923, an increase of 7.75 per cent. Operating expenses, including depreciation, were $4,807,538 in 1924, compared with $4,716,106 in 1923, an increase of only 1.94 per cent. Except on five lines revenue exceeded expenses.

The number of employees was 1842, of whom 1,173 were trainmen, receiving 56 to 71 cents an hour. Twenty-two inspectors, instructors and station masters received $165 to $175 a month. Vacations for the employees cost the railway $110,961 out of a payroll of $3,213,794, or 3.4 per cent.

Accidents continue to be a source of concern. They totaled 5,207 in 1924, compared with 4,627 in 1923 and 3,989 in 1922. The cost of the injuries and damages account was $69,869 in 1924, compared with $81,708 in 1923 and $37,368 in 1922. In 1924 there were 240 step accidents on standing cars, compared with 225 the previous year, and 85 step accidents on moving cars, compared with 73 the previous year.

President Testifies on Valuation Issue

The fourth week in the hearing to place a valuation on the property of the United Railways & Electric Company, Baltimore, which is being conducted before the Maryland Public Service Commission, witnessed the appearance of Charles D. Emmons, president of the company. In his testimony Mr. Emmons said that at least $85,000,000 was a fair valuation of the property. The question of easements is expected to be one of the points to be fought with considerable energy on the part of Clarence W. Miles, people's counsel. The company also expects to complete its side of the case in the near future, including testimony dealing with the proposed $1 unlimited weekly pass. The company was ordered to present its side on the unlimited weekly pass following the filing of a petition.

The Great American Pyramids

Long denied what was justly due to them during the war-time period the utilities, particularly the light and power utilities, are coming into their own on the earnings side. This has been reflected market-wise in advances in quotations for the common stock of some of the companies that have attracted a big following from the public. On the other hand, several warnings have recently been sounded. For instance an article, "The Great American Pyramids," in *Barron's* for May 25 said that with its rates restricted to levels which will produce no more than a fair return it would seem that the speculative opportunities in stocks of the electrical utilities would not be large, but it said that the recent stock market activity of the stocks of some leading utilities is in striking contrast with this supposition. As indicative of some of the advances which have occurred in leading utility stocks in the past few years that paper cited the following:

Stock	1925 High	1921 Low	Per Cent Advance
American Water Works & Electric	317½	4	7,837
Middle West Utilities	102⅜	13	690
Stand. Gas & Electric	54¼	7⅛	631
Am. Pwr. & Lt.	727⅝	54	1,247
Commonwealth Power	182¾	10	1,727

The figure given as the 1925 high for three of these stocks is not the actual high for the year to date, but is adjusted to give effect to capital readjustments which have been made since the 1921 low point was reached.

This authority says that the explanation of the extraordinary contrast between these figures and the theoretical supposition that utility securities offer little opportunity for speculative profit is simply the result of successful trading on the equity.

The relationship between capital structure and price movements is well illustrated by the market action of the stocks of the five leading independent electric utility companies of the country during the past four years. The group includes Brooklyn Edison, Commonwealth Edison, Detroit Edison, Edison Electric of Boston and Philadelphia Electric. The capital structure of Brooklyn Edison as of Dec. 31 last is typical of the group. It included $45,696,000 funded debt and $59,754,000 capital stock of one class. The following table indicates the comparatively moderate advance which has occurred in stocks of this type:

Stock	1925 High	1921 Low	Per Cent Advance
Brooklyn Edison	140	88	59
Commonwealth Edison	139	101½	37
Detroit Edison	124¼	88	41
Edison Elec., Boston	214	142¼	50
Philadelphia Electric	45⅞	21	118

As *Barron's* sees it, a comparison of this table with the previous table of the market movement of leading holding company stocks suggests the advantages of doing business on a shoestring, relatively speaking, when the trend is in the right direction. This note of warning, however, is sounded:

> How far may such a movement as has occurred in public utility holding company stocks in the last four years be expected to go? Regulatory commissions are not likely to permit utility companies to earn much more than an 8 per cent return on capital investment as a general rule. The process of pyramiding cannot with impunity be carried to the limit. Investors with good memories may remember the fate of the Rock Island Company and the Interborough Consolidated Corporation as horrible examples of "shoe-string" holding companies which fell upon evil days. A combination of increased operating costs and delay in granting rate increases would be disastrous to some public utility holding companies whose equities are particularly thin.

Scrapping of Equipment Misconstrued

Angles entirely unwarranted by the facts in the case have recently been given by the newspapers to the decision of the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa, to dismantle some 300 box cars. In fact, this decision on the part of the management has been made to appear as "another evidence of the decline of the railroad." It is no such thing. The decision of the management is not an unusual one. The cars in question have been written off. They were regarded as being beyond the stage where it would pay to expend any further sums in their rehabilitation. Such parts of the equipment as are worth salvaging will be redeemed.

This road has always done well financially and is doing so now. It is one of the most intensively developed short lines in the United States, exchanges equipment with the steam roads and routes its cars through to all parts of the country. The total mileage operated is 152, but the system, according to the latest official data, had more than 2,500 cars similar to the 300 now about to be scrapped in a proceeding that is neither new nor unusual except to the ill-informed.

Drum Organization Active at Detroit

A. L. Drum of A. L. Drum & Company, Chicago, Ill., has been engaged by the receivers of the Detroit United Railway as the executive manager to work for and with the receivers in laying out plans for the future operation of the D.U.R. properties. A complete survey of the D.U.R. system is being made.

Studies are also being made to determine changes to be made to improve service and better the railway company's financial condition. Certain changes in policy have become effective.

The receivers have filed in federal court a petition for permission to issue $1,600,000 of receivers' certificates. The date of hearing was set for June 8.

Deficit on Interborough for Ten Months.—Total revenue of the Interborough Rapid Transit Company, New York, from all sources for April, 1925. was $5,142,256. After allowing for all operating expenses, taxes and income deductions there was a balance of $95,344. The statement also shows figures for the ten months ended April 30, 1925. The total revenue from all sources was $48,953.481, an increase of $656,637 over the corresponding period ended April 30, 1924. This increase, however, was more than offset by increased taxes and income deductions, the latter due chiefly to higher Manhattan (Elevated) rental, which became effective on July 1, 1924, under the readjustment plan.

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Operating expenses during the period were lower than in the corresponding period of last year, but there was a deficit of $33,848 for the first ten months of the current fiscal year.

Revenues Decrease.—Total operating revenues for the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind., for 1924 were $3,477,052, a decrease of $423,990 compared with 1923. Operating expenses were $3,127,536. The assets were $31,703,077, an increase of $353,573 over 1923. The company's list of investments for the year shows $13,600 for the purchase of the Indiana Motor Transit Company.

Merger Planned.—The Central Hudson Gas & Electric Company has asked permission of the Public Service Commission to acquire all outstanding stock of the Citizens' Railroad, Light & Power Company and the outstanding stock and mortgage bonds of the Southern Dutchess Gas & Electric Company, and to merge these companies. It desires also to purchase the stock of the Fishkill Electric Railway.

Manhattan Dividend Payments Authorized.—At the regular meeting of the board of directors of the Interborough Rapid Transit Company, New York, on June 2, the quarterly installment of Manhattan Elevated Company rental, due July 1, 1925, at the rate of $1.25 per share, was authorized. Payment of the deferred quarterly installment due on Jan. 1, 1925, at the rate of $1.25 per share, was also authorized. Both payments will be made on July 1, 1925, to stockholders of record on June 15.

Sale of Land Approved.—Sale of the four parcels of land at North Warren and West Hanover Streets, Trenton, N. J., by the Trenton & Princeton Traction Company has been approved by the Board of Public Utility Commissioners. The sale price was $85,000. The commission found that three of the properties involved were not needed for railway purposes. In the fourth instance the board's approval was given with the proviso that the Trenton & Princeton Traction Company and the New Jersey & Pennsylvania Railway be allowed by the new owner to use the land as a terminal.

More Valuation Evidence at St. Paul.—Supplemental evidence in regard to valuation of the properties and operating expenses of the St. Paul City Railway and the Minneapolis Street Railway, operating in St. Paul and Minneapolis, Minn., were to be admitted at the conference of the railway's representatives, the two cities and the Railroad and Warehouse Commission on June 1. The valuations of the two companies as given out by the commission two months ago was for 1922 in Minneapolis and 1924 in St. Paul. These may be brought up to date. Proponents of the plan to restore the neutral zone in St. Paul, abolished Jan. 7, 1922, with one fare to and from either city will be heard. The proceedings have to do with the determination of a permanent fare in the two cities based on a valuation of the properties. The rate is now 6 cents by arrangement with the Councils of the two cities. The companies are now in the jurisdiction of the State Railroad and Warehouse Commission.

Legal Notes

FEDERAL DISTRICT COURT.—*Trade Union Enjoined from Conspiracy to Obstruct Interstate Commerce.*

An injunction will lie to restrain employees of a telegraph company engaged in interstate business from conspiring to prevent it from performing its contracts by compelling it to discharge its employees who are not members of labor unions with which the defendant employees are affiliated. While an employee has a right to cease work, the cessation of work may be an affirmative step in an unlawful plan. One may not accept employment intending thereby to quit work when that act will enable him to perform one step in a criminal conspiracy. (Western Union Tel. Co. vs. International B. of E. W. 2 Fed. (Second) Rep., 993.)

FEDERAL SUPREME COURT.—*Commission Order Invalid When Confiscatory.*

Where the rates found by a regulatory body to be compensatory are attacked as being confiscatory, the court may inquire into the method by which the conclusion of the regulatory body was reached and may grant relief where the order was based on evidence which does not support the conclusions. The fact that the regulatory body issued the order for an experimental period does not alter its invalidity where the railroad's evidence tended to show that the existing rates, though higher than those fixed by the order, were confiscatory. (Northern Pacific Ry. et al. vs. Department of Public Works of Washington et al., 45 Supreme Court Rep., 412.)

MISSOURI.—*Humanitarian Rule as Applied to Infants.*

A child less than four years of age is in law incapable of contributory negligence, and in the application of the humanitarian rule, such a child is conclusively presumed to be oblivious of certain peril. (Moll vs. Wells, 270 Southwest Rep., 154.)

MISSOURI.—*Slippery Road No Excuse to Driver Operating Automobile at High Speed.*

In his opening statement, counsel for the plaintiff, the driver of an automobile, said his client saw the approaching street car when both were about 75 ft. away from the point where later the collision occurred, and that he tried to stop his automobile, but it skidded on the icy pavement and ran into the car. He claimed the car exceeded its lawful speed. The Supreme Court held that with this admission the Trial Court was warranted in closing the case at once and giving judgment to the defendant. (Wood vs. Wells, 270 Southwest Rep., 332.)

NEW HAMPSHIRE—*Part of Maintenance of Bridge over Steam Railroad May Be Placed on Street Railway Using Bridge.*

Under the New Hampshire law, a steam railroad must maintain the highway bridges over its tracks, and street railways are not allowed to use such bridges without the authority of the Public Service Commission. This case was in regard to the maintenance of a bridge over the tracks of the Boston & Maine Railroad, the bridge being used by a street railway which had not obtained the consent of the Public Service Commission to do so. It had, however, an agreement with the city for the use of the bridge. The court held that the primary duty of maintaining the bridge rests upon the steam railroad, but that the Public Service Commission may require the electric railway to pay any added expense made necessary by its use of the bridge. [City of Laconia vs. Boston & M. R.R. et al., 128 Atlantic Rep., 350.]

NEW JERSEY.—*Degree of Care Required at Passenger Station.*

While a common carrier of passengers must exercise a high degree of care as to its speeds and modes of conveyance of passengers, it is obliged to exercise only ordinary or reasonable care in the construction and maintenance of its station buildings, platforms and approaches. Hence, an instruction by the trial judge that it was the duty of the company "to use a high degree of care that the station should remain reasonably safe," was erroneous and harmful. (Holtzman vs. H. & M. R., 128 Atlantic Rep., 623.)

NEW JERSEY.—*Presumption of Negligence.*

In this case a passenger was injured when a car-door closed prematurely. In affirming the judgment in favor of the plaintiff the court quoted with approval the decision in an earlier case which says in part: "where a passenger shows that he was injured through some defect in the appliances of the carrier, which might have been prevented by due care, the jury may infer negligence, unless the carrier proves that due care was exercised. This inference is a legal inference in the sense that it is permitted by law, but not in the sense that it is required by law." (McPherson vs. Hudson & M. R., 128 Atlantic Rep., 231.)

NEW YORK—*Employee of One of Several Associated Lines Not an Employee of the Others.*

Ten railways, forming part of the Third Avenue Railway System, maintain jointly one employment bureau and school for instruction, from which men are sent sometimes to one line and sometimes to another of the associated group, or they may be transferred from one road to another. An employee of one of these lines was injured by a car of another line, and the company claimed that he was injured by a fellow servant and his only remedy was under the Workmen's Compensation Act. This plea was denied by the Court of Appeals. [Doran vs. New York City Interborough Railway, 147 Northeast Rep., 62.]

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NEW YORK.—*Transportation of Passengers on Urban Line Not "Interstate Commerce."*

The International Railway operates all the street railways in Buffalo and has an interurban line to Niagara Falls and a connecting line running through Ontario to Queenstown, Ont. A trackman was killed while at work on one of the city lines in Buffalo, but the court held that he was not engaged in foreign commerce so as to make the company liable under the federal employers' act for his death. (Borelli vs. Internat. Ry. 127 Northeast Rep., 356.)

PENNSYLVANIA.—*Truck Attempts to Beat Trolley Car at Crossing—Company Responsible.*

At a crossing on an interurban line, where the view was obscured, a truck with a number of workmen crossed in front of the trolley car. The driver and vehicle passed without collision, but several men in the truck jumped to escape injury and one was struck by the trolley car and was killed. The company and the driver of the truck were held jointly responsible. [Smith vs. Reading Transit & L. Co., 128 Atlantic Rep., 439.]

RHODE ISLAND.—*Position of Boarding Passenger When Car Starts.*

A street railway company does not have to wait until a passenger is seated until it starts a car, but only until the passenger has reached a position of safety. Hence, it was not negligent to start a car when a passenger had both feet placed solidly on the vestibule floor. (Straight vs. United Electric Rys., 128 Atlantic Rep., 571.)

WEST VIRGINIA.—*Eminent Domain for Transmission Line.*

A company operating an electric railway and also furnishing electric light, heat and power to commercial and industrial customers, is entitled to exercise eminent domain in the construction of transmission lines without obtaining a special permit from the Public Service Commission. (Monongahela-West Penn P. S. Co. vs. C. F. Cunningham Co., 127 Southeast Rep., 61.) (See also 127 S. E. Rep., 23.)

WEST VIRGINIA.—*Interurban Passenger Carried Beyond Destination Is Injured While Walking on Track.*

The plaintiff, a woman 52 years of age, and her married daughter, were carried a mile beyond their destination into a sparsely settled part of the city. They were directed to alight and come back on the next car, due in 15 minutes. It was about 9 p.m. Waiting for some time, they attempted to walk back on the track and fell off a trestle about 10 ft. high. Later they were picked up by an interurban car and taken home. Roads, safe and convenient for pedestrians, ran parallel to the track about a block away on each side, but the passengers were not aware of these roads. The Court of Appeals held that, as a matter of law, the plaintiff could not be held guilty of contributory negligence, preventing a recovery and declined to disturb a judgement for the plaintiff, awarded in the trial court. (White vs. Ohio Valley Electric Railway, 127 Southeast Rep., 56.)

Personal Items

Mr. Crawford Consultant

Well-Known Executive Establishes Himself in New York as Public Utility Expert

Norman McD. Crawford, formerly vice-president and treasurer of the Columbus Railway, Power & Light Company, Columbus, Ohio, has established himself in consulting practice at 95 Liberty Street, New York. He is prepared to act in public utility investigations and to report on financial, engineering and operating problems. Mr. Crawford left the company at Columbus in January last. He had anticipated taking things easy after a career of more than 40 years in public utility work. He did cut himself adrift from business for several months, but found idleness irksome. The necessity for him to be active does not exist, but he will undoubtedly be more than busy along lines of his own choosing

Norman McD. Crawford

Mr. Crawford's career in public utility work was reviewed briefly in the ELECTRIC RAILWAY JOURNAL for Jan. 31. Back of him there is a wealth of experience in practically all lines of electric public utility operation that makes it baffling to know just what to record and what to leave out in order to keep any record of his activities within bounds. Entirely aside from his managerial experience, this is not the first time that Mr. Crawford has engaged in consulting work. Way back in the early days of electric traction he had an engineering office in the World Building, New York, and in his capacity as engineer constructed the electric railway from Hartford to South Glastonbury, Conn. He also constructed the electric railway from Millville to Bridgeton, N. J., supervised the change in motive power from horse to electricity on the Jersey City-Bergen line and installed the Grand Avenue electric station in Jersey City. These are just a few of the things he did.

Later he was expert in connection with the Peoria, Ill., electrolysis case and the Dayton electrolysis case. As consulting engineer for the Connecticut Company he constructed the line from Hartford to Middletown. He was also tramway expert for the National Civic Federation in its investigating of public ownership and operation of tramways in England. Furthermore, he reported on the operation of the Second Avenue Railway in New York for the protective committee representing the bondholders.

Interlarded with this wide experience as a consulting engineer and expert Mr. Crawford served in various operating capacities, notably superintendent of the Meridan Horse Railroad, general manager of the Rochester Street Railway, general manager of the Hartford Street Railway, vice-president and general manager of the Ohio Electric Railway, president of the Mahoning & Shenango Railway, president of the Reading Transit & Light Company and vice-president and treasurer of the Columbus Railway, Light & Power Company.

This is a mere outline of the work of the man, but it does convey an idea of the wide range of his activities and the wealth of knowledge and experience at his command for application to such problems as may be brought before him in his present capacity of consulting engineer.

Officials of Public Service Bus Organization Reassigned

Changes in the duties of some of the employees of the Public Service Transportation Company, Newark, N. J., the bus operating subsidiary of the Public Service Railway, have been announced by Matthew R. Boylan, vice-president in charge of operation.

Fred M. Shipman, general superintendent of the auto maintenance department, is placed in full charge also of bus maintenance and repairs.

Frank P. Freeman is made assistant superintendent in charge of garages and servicing.

Howard G. Young becomes superintendent of shops and is stationed at the Irvington bus repair shop.

H. A. Benedict, mechanical engineer, will direct the work of handling the body repairs and painting.

Operating Managers Appointed for Long Island Lines

Gen. Lincoln C. Andrews, receiver, has announced that he has appointed the firm of Fisk & Roberts operating managers of the New York & Queens County Railway, the New York & Long Island Traction Company and the Long Island Electric Railway. In putting Fisk & Roberts in charge of the operation and rehabilitation of these New York City traction lines General Andrews was influenced in his choice by the previous record of the two members of the firm in public utility management and by his belief in the doctrine

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that best results can be secured from the properly directed enthusiasm of young men who have everything to gain from successful accomplishment on their part.

The railways in General Andrews' charge operate more than 100 miles of track serving most of the Borough of Queens in the city of New York and the county of Nassau lying just over the city line. Announcement was made in the ELECTRIC RAILWAY JOURNAL of May 9 of the organization of Fisk & Roberts, with New York offices at 82 Beaver Street.

Changes in Southwest Personnel

Messrs. Clifford and Bradley in New Roles with Stone & Webster Organization

George H. Clifford, vice-president and general manager of the Northern Texas Traction Company, Fort Worth, Tex., winner of the Coffin award last year, brings a wealth of experience for application to his new position of southwestern district manager over all Stone & Webster properties in Texas, Louisiana and New Mexico. The properties involved embrace companies with many diversified interests, but Mr. Clifford's record with the Northern Texas Traction Company has proved that he has talents capable of wider application than was afforded in his work at Fort Worth.

Necessarily a man responsible for the operation of the property that carries off the coveted Coffin premium must have made a record that marks him apart from most other men in similar capacities. Competition for the Coffin award is keen. The prize goes to "that electric railway in the United States which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well-being of the public and for the benefit of the industry." And with the prize goes an unexpressed encomium to the manager of the property to which the award is made more far-reaching than any words of eulogy, however significant the terms in which they might be couched.

This man to whom promotion has now come more nearly in keeping with his talents was born at Fort Worth in 1881. He was graduated from the public schools and attended Weatherford College. After he left school he worked as a stenographer for several companies until 1901, when he entered the service of the Northern Texas Traction Company as secretary to F. M. Haines, general manager of the company, owned by the Bishop & Sherwin syndicate, Cleveland, Ohio. In 1903 Mr. Clifford was made secretary and treasurer of the company. This position he held until 1905, when the property was purchased by Stone & Webster of Boston, Mass. After the change in ownership he was made general superintendent. In 1910 he was elected vice-president and general manager of the Northern Texas Traction Company and in addition general manager of the Fort Worth Southern Traction Company, a 32-mile interurban line between Fort Worth and Cleburne, Tex., and the Arlington Light & Power Company, which is engaged in the water, light and ice business at Arlington, Tex.

Luke C. Bradley, succeeded by Mr. Clifford and now division manager in charge of the southeastern and southwestern districts for Stone & Webster with headquarters in Boston, was appointed district manager of the Stone & Webster properties in Texas in 1916. His service with Stone & Webster covers a period of 25 years. For the last 30 years he had been engaged in public utility work in responsible positions of an engineering and operating character throughout the United States. Mr. Bradley went to the gulf coast section of Texas in 1910 as vice-president of the Houston Electric Company, Galveston-Houston Electric Railway and Galveston Electric Company and manager of the two latter companies. In these capacities he was a constructive factor in the development of the Galveston-Houston territory. Early in 1913 he was appointed assistant district manager of the Stone & Webster properties in Texas, relieving Mr. Phinney of a large part of his duties as district manager. For a while the office was maintained in Dallas, but on account of its more centralized location with respect to the Stone & Webster properties headquarters were moved to Houston.

G. H. Clifford

L. C. Bradley

Obituary

B. S. Josselyn

Benage S. Josselyn, former president of the Portland Railway, Light & Power Company, now the Portland Electric Power Company, Portland, Ore., died on May 26.

He became president of the Portland Railway, Light & Power Company in 1907 and retained this position until 1913. Mr. Josselyn left school at the age of 14 and entered railroad service as a ticket clerk. He was identified at one time with the Kansas City, Osceola & Southern Railway, the Omaha & St. Louis and the Omaha, Kansas City & Eastern lines. During 1902 and 1903 he was general manager of the Hudson Valley Railway, Glens Falls, N. Y. Later he was general manager of the Union Terminal Railway in Sioux City and during 1906 and 1907 he was vice-president and general manager of the Maryland Telephone & Telegraph Company and the Baltimore Electric Power Company.

During the time he was president of the Portland property the River Plant at Estacada was built, the east side city line was rebuilt, several narrow-gage lines were changed to broad gage and many shops and carhouses were constructed.

L. C. Haynes

Louis C. Haynes, vice-president of the East St. Louis & Suburban Railway, East St. Louis, Ill., and associated properties, died at his home in St. Louis, Mo., on May 22. He was 73 years old and had been active until a few days prior to his death. Mr. Haynes had been connected with the railway system at East St. Louis since 1902. Prior to that he had been engaged in the real estate business in East St. Louis. About 50 years ago he went to St. Louis as a reporter for the St. Louis *Daily Journal*. He also served the *Daily Leader* of Cleveland for several years as a reporter and assistant city editor. When the *Journal* was purchased by the late Joseph Pulitzer of the *Post-Dispatch*, Mr. Haynes organized the Haynes Realty & Financial Company. In the year 1893 he became connected with E. W. Clarke & Company, Philadelphia, and was assigned to administrative duties with the East St. Louis properties of the Clarke firm in 1902. He was an extensive traveler and wrote a brochure of his experiences on a trip to the Holy Land several years ago.

T. A. H. Hay

Thomas A. H. Hay, for eight years secretary of the Easton Board of Trade, and pioneer in construction of electric interurban railroads in Easton, Pa., and vicinity, died on May 28 in a Philadelphia hospital, at the age of 69. He was a member of many organizations, including the Pennsylvania Society of New York and the Manhattan Club, and had been president of the Zeta Psi fraternity. His brother, W. O. Hay, is vice-president and general manager of the Northampton Transit Company, Easton.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Trade Statistics Not Illegal

Supreme Court Explains Status of Dissemination of Business Information —Holds Public Interests Served

A decision clarifying the legal view of trade association activities in gathering and distributing statistics was handed down by the United States Supreme Court on June 1 when decrees of lower courts enjoining the Maple Flooring Manufacturers' Association and the Cement Manufacturers' Protective Association under the Sherman anti-trust law were reversed. The decision was by a divided court, six to three. The majority opinion was delivered by Justice Stone, the newest member of the court, who, as Attorney-General, had given considerable study to the question of trade statistics at the request of the Department of Commerce.

Justice McReynolds entered a vigorous dissent in each of the two cases on the ground that the tendency of the activities complained of by the government clearly was to enrich the members of the associations by controlling production or prices or both to the detriment of the consumer. Chief Justice Taft and Justice Sanford dissented in each case on the ground that the evidence brought these cases within the rule laid down by the court previously in decisions sustaining decrees against the American Column & Lumber Company and the American Linseed Oil Company.

The majority opinion, however, holds that in these previous cases clear intent to evade the law was established, while in the cases at issue circumstances were different.

The principal decision was read in connection with the decree issued by the District Court in Michigan against the Maple Flooring Manufacturers' Association. The association operates principally in Michigan, Minnesota and Wisconsin. It gathered and distributed statistics of production, stocks, unfilled orders and average sales prices; it published a book giving railroad rates from Cadillac, Mich., to some 1,000 points in the country, and members held meetings where statistics and other matters were discussed. These things in themselves do not constitute restraint of trade, the majority opinion holds.

The Cement Manufacturers' Protective Association operated along similar lines of gathering and distributing information. In addition, in this case the question of distributing information regarding specific job contracts was involved. The government sued in the District Court of Southern New York for an injunction, alleging violation of the Sherman law, and was given a decree. Justice Stone, for the majority of the Supreme Court, predicated his opinion in the cement case on that in the flooring manufacturers' case, adding that information regarding specific job contracts was not violative of the law, because it had not been established that contractors suffered, but merely that the system protected manufacturers against contractors who might take advantage of such contracts for cement if the market was favorable.

After reciting the history of the case, the majority opinion in the flooring manufacturers' association case lays down broad principles in part as follows:

> It is not, we think, open to question that the dissemination of pertinent information concerning any trade or business tends to stabilize that trade or business and to produce uniformity of price and trade practice. Exchange of price quotations of market commodities tends to produce uniformity of prices in the markets of the world. Knowledge of the supplies of available merchandise tends to prevent over-production and to avoid the economic disturbances produced by business crises resulting from over-production. But the natural effect of the acquisition of wider and more scientific knowledge of business conditions on the minds of the individuals engaged in commerce and its consequent effect in stabilizing production and price can hardly be deemed a restaint of commerce or, if so, it cannot, we think, be said to be an unreasonable restraint, or in any respect unlawful.
>
> It is the consensus of opinion of economists and of many of the most important agencies of government that the public interest is served by the gathering and dissemination, in the widest possible manner, of information with respect to the production and distribution, cost and prices of actual sales of market commodities, because the making available of such information tends to stabilize trade and industry, to produce fairer price levels and to avoid the waste which inevitably attends the unintelligent conduct of economic enterprise. Free competition means a free and open market among both buyers and sellers for the sale and distribution of commodities. Competition does not become less free merely because the conduct of commercial operations becomes more intelligent through the free distribution of knowledge of all the essential factors entering into the commercial transaction. Restraint upon free competition begins when improper use is made of that information through any concerted action which operates to restrain the freedom of action of those who buy and sell.
>
> It was not the purpose or the intent of the Sherman anti-trust law to inhibit the intelligent conduct of business operations, nor do we conceive that its purpose was to suppress such influences as might affect the operations of interstate commerce through the application to them of the individual intelligence of those engaged in commerce, enlightened by accurate information as to the essential elements of the economics of a trade or business, however gathered or disseminated. Persons who unite in gathering and disseminating information in trade journals and statistical reports on industry; who gather and publish statistics as to the amount of production of commodities in interstate commerce, and who report market prices are not engaged in unlawful conspiracies in restraint of trade merely because the ultimate result of their efforts may be to stabilize prices or limit production through a better understanding of economic laws and a more general ability to conform to them, for the simple reason that the Sherman law neither repeals economic laws nor prohibits the gathering and dissemination of information. Sellers of any commodity who guide the daily conduct of their business on the basis of market reports would hardly be deemed to be conspirators engaged in restraint of interstate commerce.

The court ruled that such information gathered and disseminated among the members of a trade might be the basis of agreement or concerted action to lessen production arbitrarily or to raise prices beyond the levels of production and price which would prevail if no such agreement or concerted action ensued, and those engaged in commerce were left free to base individual initiative on full information of the essential elements of their business. Such concerted action constitutes a restraint of commerce and was illegal and might be enjoined as might any other combination or activity necessarily resulting in such concerted action as was the subject of consideration in American Column & Lumber Company vs. United States *supra* and United States vs. American Linseed Oil Company *supra*. But in the absence of proof of such agreement or concerted action under the present plan of operation of defendants no basis could be found in the gathering and dissemination of such information or in their activities under their present organization for the inference that such concerted action would necessarily result within the rule laid down in those cases.

Rubber Prices Rebound

Rubber at 70 cents gives new proof of the utter impossibility of controlling programs intended to restrict production. After having stated that they would be satisfied with 32 cents the British find that they are not able to augment production quickly when the need arises.

The high price may be worth enduring as it will boom rubber production outside of British possessions, it is pointed out. The weakness of any control of production is that it tends to stimulate production on one end and to restrict consumption on the other. Sooner or later this process breaks down the control. In the case of rubber, in addition to the increases of production in the Dutch possessions, which are pledged not to restrict production, and in other rubber-growing areas there will be larger resort to secondary supplies. The reclamation of rubber, which is done very successfully, is profitable when the price of the raw material is high.

It also is expected that present prices will reduce the rate of consumption very materially. Even in the case of a commodity such as coffee price increases reduce the amount used. The recent advance in the price of coffee is said to have discouraged consumption to the extent of 25 per cent.

Metal, Coal and Material Prices

Metals—New York	June 2, 1925
Copper, electrolytic, cents per lb	13.60
Copper wire base, cents per lb	15.875
Lead, cents per lb	8.425
Zinc, cents per lb	7.32
Tin, Straits, cents per lb	54.875
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.25
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.875
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-bbl. lots), N. Y., per gal	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb	0.1575
Turpentine (bbl. lots), N. Y., per gal	$1.01

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Change in Status of Bureau of Mines

After mature consideration officials of the Department of Justice are understood to be of the opinion that there is no legal reason why the Bureau of Mines may not be transferred to the Department of Commerce. It was said in the ELECTRIC RAILWAY JOURNAL issue of April 4, page 567, that this transfer was expected.

The organic act of the Department of Commerce empowers the President to transfer to that department any scientific agency, outside the Department of Agriculture, that he may see fit. The Bureau of Mines was created after the Department of Commerce. For years there has been a question as to the application of the law to that particular bureau. The doubt now has been removed and it is assumed that the administration will indicate its faith in its own reorganization plan and make the transfer.

Rolling Stock

Key System Transit Company, Oakland, Cal., has been advised by the Board of Engineers, which has been conducting a traffic study of that property, to purchase 100 new cars over a period of three years. Of this number 30 are to be purchased at once.

Havana Electric Railway, Light & Power Company, Havana, Cuba, during 1924 built and equipped 50 new model passenger cars and reconstructed four old-type cars. The construction of 50 additional new cars was authorized, of which fifteen were begun. The new model bodies are lighter, stronger and more durable. They have seats for 36 passengers, against 32 for most of the old type, and the aisles and platforms are wider so they can accommodate more passengers and carry them more comfortably. The average weight of the new cars with modern motors is 17,500 lb. The older types weigh about 20,000 lb. The only important change in car body construction during the year was the substitution of riveted steel floor frames for the wood beam construction formerly used. The steel frames are lighter, cheaper and stronger.

Chicago & Joliet Electric Railway, Joliet, Ill., has purchased four Mack 25-passenger city-type buses to be placed in operation on city routes.

Department of Street Railways, Detroit, Mich., has received permission through the City Council to purchase ten Reo pay-enter buses.

Oklahoma Railway, Oklahoma City, Okla., has placed an order for three Reo pay-enter buses.

Track and Line

Seattle, Wash.—The City Council utilities committee recently took steps toward the extension of the Cowen Park line by recommending the passage of an ordinance which provides that $72,000 required to finance the extension be raised through sale of negotiable interest-bearing street railway department warrants. As proposed, a wooden trestle, 687 ft. long, will be constructed through Cowen Park and the railway tracks extended on Fifteenth Avenue from Ravenna Place to Victory Way.

Philadelphia Rapid Transit Company, Philadelphia, Pa., plans to make extensions by laying a single track on Venango Street between Twenty-second Street and a point near Twenty-third Street, and a single track on Hunting Park Avenue between Twenty-second Street and a point approximately 200 ft. east of the central line of Wissahickon Avenue. The Board of City Surveyors has approved the plans on the ground that the object of the new line was to facilitate the routing and handling of cars and to afford accommodations to the large number of persons employed in large industrial plants.

Municipal Railway of St. Petersburg, St. Petersburg, Fla., will soon complete its $200,000 railway improvement program. The double tracking of Second Street north from First to Fifth Avenues has been completed and workmen are paving between the tracks. Locust Street from Fifteenth to Twenty-first Avenue has also been completed. Work will be started about the end of July on Euclid Boulevard from Fifteenth Street to Thirty-fifth Street.

Los Angeles Railway, Los Angeles, Cal., has started work on the extension of Melrose Avenue from Normandie Avenue to Western. The company is also planning the Fifth Street extension to make that street a through street.

Trade Notes

American Manganese Steel Company, Chicago Heights, Ill., has placed in operation a new foundry at Los Angeles Cal., for the manufacture of Amsco steel casings. The new Los Angeles foundry is of steel construction throughout. The organization has facilities for producing about 25,000 tons of manganese steel casings annually.

Nugent Steel Castings Company, Chicago, Ill., manufacturer of small and thin section steel castings, has recently placed in operation an electric annealing furnace for the treatment, in this manner, of its entire product.

Moreland Motor Truck Company, Los Angeles, Cal., has just brought out a six-wheel truck suitable for handling materials used in truck and highway construction for transmitting coal. It is of 6-ton capacity and is equipped with a four-cylinder or six-cylinder engine, depending on the service to be given. It can be geared for a speed of 35 m.p.h. if desired. A special feature of the chassis construction is the use of six wheels.

Austin Company, Cleveland, Ohio, has been awarded a general contract covering the design, erection and equipment of the new plant of the G. A. Gray Company, Cincinnati, one of the largest manufacturers of steel planers. The new plant under construction in the Idlewild district will represent an investment of practically $1,000,000. The equipment installed under the Austin contract includes heating, lighting, plumbing, air and gas lines, electric equipment, sprinkler system, railroad trackage and boiler house equipment. The contract requires that construction work of the building be completed in 90 working days, with an additional 30 days for the installation of equipment. This will bring the Gray Company into complete possession of its new building in the fall of the year.

Conveyors Corporation of America, Chicago, Ill., announces that the Kent Engineering Company district representative has removed his office to 716-718 Builders Exchange Building, Minneoplis, Minn. The Kent Engineering Company handles the sale of American steam jet ash conveyors, airtight doors, ash gates and other power plant supplies in Minnesota and adjacent territory.

New Advertising Literature

Electric Railway Equipment Company, Cincinnati, Ohio, has issued a new catalogue of "Elreco Tubular Steel Pole Tables and Pole Fittings." Elreco pole table, giving weight, section lengths and deflection under various loads, are published in this pamphlet, "with the idea of assisting prospective customers or engineers to select without difficulty the size and weight pole most suitable for their particular conditions."

Conveyors Corporation of America, Chicago, Ill., has issued a folder called "American Air-Tight Doors." It discusses the air-tight door for ash-pits, boiler settings and other locations where an air-tight door is needed.

Electric Machinery Manufacturing Company, Minneapolis, Minn., has issued bulletin No. 799 on automatic starters for synchronous motors. This booklet is illustrated and contains a separate bulletin, No. 785A, dated November, 1924, listing some users of the Electric Machinery synchronous motors.

Roller-Smith Company, New York, N. Y., has issued two new bulletins on two new lines of apparatus. Bulletin 400 covers two lines of small direct-current panel type instruments. Supplement to Bulletin 530 describes the new non-closable on overload circuit breaker recently brought out by the company.

Cleveland Twist Drill Company, Cleveland, Ohio, has issued catalog No. 41, a 243-page pamphlet with index and illustrations showing all its regular tools and a few special tools. In this new catalog are found several new items, such as special drills for bakelite and slate, a new small jobbers' carbon drill set and a complete new section of mechanical data with useful information for shop men.

DeVilbiss Manufacturing Company, Toledo, Ohio, has issued a folder which describes the DeVilbiss spray-painting equipment necessary for doing refinishing work with pyroxylin finish or lacquer enamels.

Una Welding & Bonding Company, Cleveland, Ohio, has issued Bulletin No. 113, called "A Continuous Path of Copper from Rail to Rail."

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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Detroit Municipal System the Prey of Politicians?

POLITICS has laid its heavy hand on the Detroit Municipal Railway. Ross Schram, general manager, and I. N. Merritt, auditor, are out. Mr. Schram was dismissed by Mayor John H. Smith for "inexperience and inefficiency" and for "neglect to furnish me with reports which I have repeatedly requested." Mr. Schram charges that it was impossible to get the Mayor's attention. One charge or the other is false. It ought not to be difficult to determine which one. Apparently taking the cue from these cases, C. E. Wilcox, claims attorney, sent in his resignation the following day. He gave no reason for retiring from the public service. Two members of the Street Railway Commission voted with the Mayor for dismissal. The other member is in Europe. Following the announcement of the dismissal Commissioner Barlum ran to political cover by putting the incubus for the removal upon the Mayor. It is understood that during his campaign Mayor Smith openly stated that if elected he would remove Mr. Schram.

The Detroit *Free Press* almost cites in justification of Mr. Schram's removal the political doctrine that to the victor belongs the spoils. It charges that in the first place Mr. Schram "was given a place under the Street Railway Commission purely as a reward for political services." It attributes Mr. Schram's present discomfiture to the "natural fortune of a war in which he engaged of his own accord." Apparently it never thought much of Mr. Schram. The comment of that paper begs the whole question. Undoubtedly had there been no politics in the matter there would be no municipal ownership in Detroit today. If politics may be said to account for Mr. Schram, does it also apply to Mr. Merritt and Mr. Wilcox? On the other hand, the Detroit *News* says that the reason for Mr. Schram's dismissal is not inexperience or inefficiency. That paper says it is politics and that Mayor Smith would have been honest if he had said so.

While fair treatment of the individual is a matter of concern to ELECTRIC RAILWAY JOURNAL, the principle underlying the action is of far greater moment. If Mayor Smith is right about Mr. Schram's inexperience and inefficiency, then W. B. Mayo, chief engineer of the Ford Company and former general manager of the railway, a man of great talent and wide experience, is wrong. It was he who recommended Mr. Schram for the job. Perhaps Mr. Schram's attitude toward the Mayor was not as conciliatory as the relative positions of the two men appeared to demand, but as between the judgment of Mr. Smith and Mr. Mayo, the weight of evidence seems to be with Mr. Mayo. As for the charge of inexperience, ELECTRIC RAILWAY JOURNAL, if it so desired, could publish a long list of men with no previous electric railway experience who have made conspicuous successes in electric railway work. Previous experience is undoubtedly an aid to success, but it is by no means an assurance of success.

Mr. Wallace, the new general manager, has wide experience. He is a capable operator. He had been assured that politics will not be allowed to interfere with his work. It is to be hoped that it will not, but in view of what has happened he does not enter upon his new duties under auspicious circumstances or prospects that are promising. If he doesn't play with politics, politics may play with him. The poison of politics is particularly penetrating. In this connection these words of the ELECTRIC RAILWAY JOURNAL, uttered only three weeks ago, were ominous: "When the bird of political patronage flies in at the window the competent ones will go out at the door. It is anybody's guess how long it will be before that event takes place." At this long distance the only conclusion that can be drawn is that the railway is apparently slated for political picking. If this be true, Detroit is face to face with calamity.

Realigning the Interurbans for More Effective Service

SIGNIFICANT action that may lead to a new set-up of the interurban lines was taken at the recent meeting of the Central Electric Railway Association. Following the lead of John A. Beeler, who outlines the situation in a paper abstracted elsewhere in this issue, the association passed a resolution to the effect that the lines in the central territory should be consolidated into one system. This is a radical move, but it is dictated by necessity, as Mr. Beeler pointed out.

The interurbans in the Middle West have been making a game fight during the past few years. It has, however, been a losing one. Passenger business has fallen off and little else has been developed to take its place. The result is that the revenues have been decreasing. As with properties all over the country, expenses have been increasing meanwhile, until the margin between income and outgo has been wiped out. Some of the properties have been forced into receivership, while others are barely able to meet their charges.

Consolidation of these properties would have many beneficial effects. Centralization of control in one aggressive management would do much to improve the situation. As it is, there are many small companies with interests more or less in common. Agreement on policies and practices that might have been beneficial to the participating companies often has not been reached. The reason for this lack of progressiveness has not always been well founded.

A new alignment of the properties would permit many economies, but better still it would make possible a new conception of service. Freight could be routed through without the difficulties that inhere in the present method. This would allow the system to obtain new sources of revenue. High-speed passenger service could be given in some places, with parlor car and sleeper service between principal cities. Local passengers, on the other hand, could be handled better on light-weight cars or on buses than in the 50-ton cars now used by most of the railways under consideration.

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To make such a plan effective would require the addition of considerable new capital. The roads in this territory are now taking in some $48,000,000 annually, with operating deductions of about $39,000,000. Fixed charges amount to approximately $12,000,000. It is estimated that some $5,000,000 to $10,000,000 would be necessary for the purchase of equipment. But with this comparatively small capital outlay this annual loss of some $3,000,000 could be changed into an annual surplus of like amount. More money could be used with profit to provide additional trackage and to build belt lines around some of the larger cities. Surely here is something worth while. It requires only capitalists with sufficient vision to realize that here is an opportunity not only for profit but for real service to all who reside in this territory.

Telling the Public that the Railway Is Ready and Anxious to Serve

WHEN a traveler alights from a train in a strange town it is a rare occurrence for him to see any sign that will indicate whether the trolley lines in that city afford a direct route to the various hotels or even to the business district. Rather than use the time and take the trouble to inquire, the stranger usually hires a taxicab and spends from five to ten times as much as would be necessary to travel by electric car; sometimes for a ride of only a few blocks.

Electric railway officials perhaps assume that the public knows which local line is the principal link between the station and the center of the city, but they forget that strangers wish to know the particular car that will serve their needs, where it can be boarded and when it will leave. Some railways have taken steps to fill this need, but the majority have not.

Another phase of this service that should be given attention is the arrangement of schedules so that cars will be available when trains arrive. Even if the traveler knows that the trolley line reaches his destination, if a car is not at hand when he wants it, he will use some other conveyance which is ready to take him.

There are many ways to furnish the information and service desired. An employee stationed at such points to direct strangers would probably be the most effective method, but conspicuous signs near or in the station, located so that they will catch the eye of prospective passengers, would be of value. A stranger alighting from a train usually looks about for directions. A flashing electric sign would be sure to attract his attention. There is a need for this kind of advertising, and the traveling public should be advised at every possible opportunity that a wide-awake electric railway is ready and anxious to serve it in that particular city.

Use of Street Railway Tracks by Other Vehicles Causes Needless Delay

CASES where traffic regulating authorities show any interest in keeping street car tracks free of other vehicles are rare compared to the number of cases where they are entirely indifferent. Yet it is often the moving vehicle, so called, rather than the parked vehicle that is the cause of interference and delay to railway operation.

At street intersections where "stop" and "go" traffic regulation is enforced, all vehicles must stop while the cross movement occurs. Moving vehicles which have been following the railway tracks stop in the path of the cars. Two or three such vehicles may force the car to stop at a considerable distance from the intersection. When the street is open to traffic again, the other vehicles hurry across, but the car usually must make a second stop at the intersection to accommodate the passengers waiting there. During this second stop the direction of traffic movement is quite likely to be changed, necessitating a considerable additional wait on the part of the trolley.

Had the other vehicles been required to keep to the side of the street they would have been delayed at the intersection no longer than they were when standing on the tracks. The street car, however, carrying many more people than the automobiles, is subject to altogether unnecessary delay from their presence ahead of the car. No one denies that theoretically street cars should have right of way on their own rails. In practice, however, very little is done to see that they get it. If city officials are really desirous of doing something to promote the orderly and expeditious movement of traffic in the street, a great improvement can be made at small cost by keeping other vehicles out of the car tracks.

Public Utility Advertising Is a Real Benefit to the Consumer

SOME super-critical citizens are apt to take exception at times to the spending of money by an electric railway in publicity. Whether it is in the form of newspaper displays or other kinds of advertising, these critics contend that the money thus spent might better be devoted to reducing fares or extending the service. Especially is this the case when the publicity is of the nature known as good-will advertising.

In an address at the recent meeting of the Associated Advertising Clubs of the World, Martin J. Insull of Chicago points out that a utility, by advertising, can secure more business and a larger gross income. This means production on a larger scale and usually with greater economy. Necessarily, all of this gain goes to the user, as under commission rule the utility is not allowed to receive any larger net return per dollar invested after it is already earning a fair return on its capital.

While the gain to the consumer from good will advertising is possibly less apparent than that from advertising an extension of the service, it is none the less real if it helps to bring about fairer treatment by the public. Moreover, this means that the business of the utility is less hazardous and consequently that the utility can borrow at lower interest rates.

Those who criticise utilities for incurring expenses for publicity explain their attitude on the ground that the utility is a monopoly. They freely admit that the business world as a whole accepts advertising as a necessity. Of course, any other position would not be tenable at the present day, but the argument is put forth that the same reasons for such advertising do not exist with a utility where there is no competition.

In a certain sense, however, no utility, even if it is protected by law from competition, is a monopoly. In the case of a railway there is always the competition of private means of transport—such as walking and the automobile or people can stay at home and not use any transportation. Advertising is needed to develop business even for a so-called monopoly. In fact, it would be rather difficult to prove that a utility really has much if any less need to advertise what it has to sell than a competitive business.

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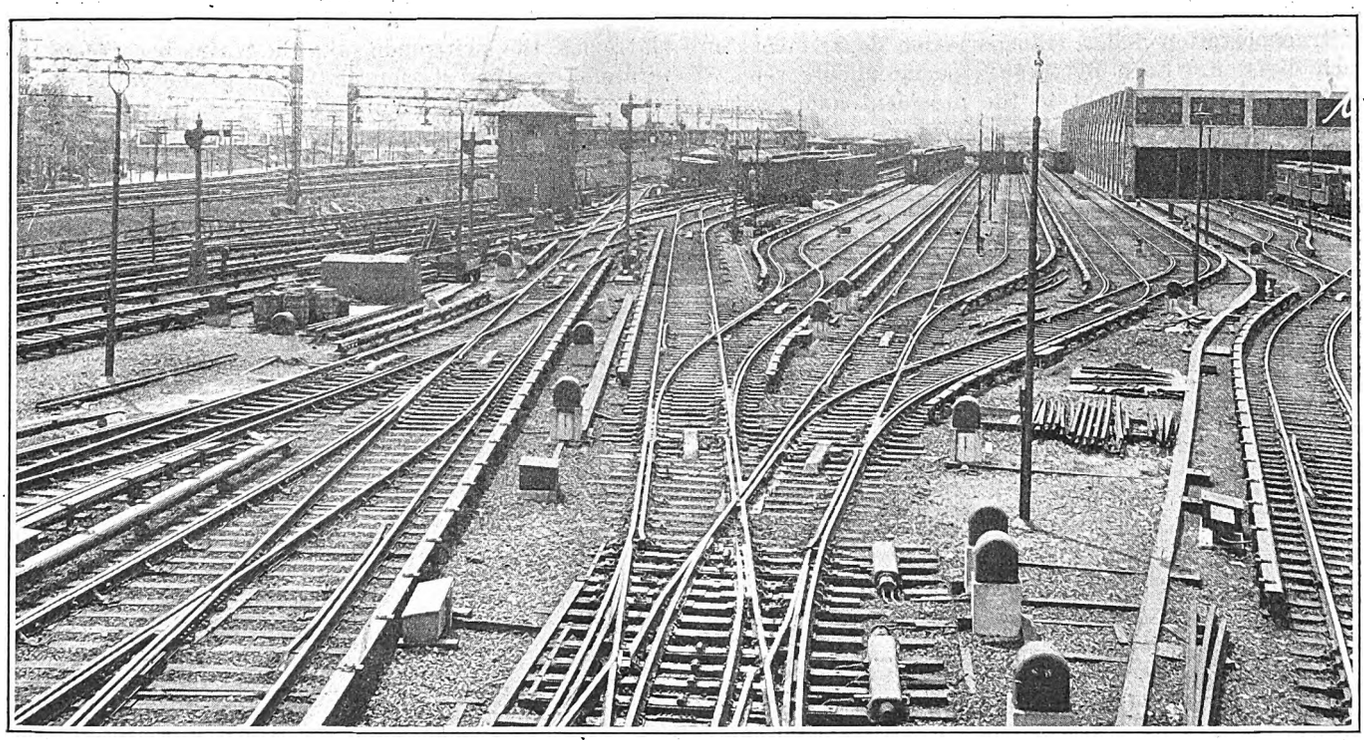
Train Operation by the Interborough

Functions of the Transportation Department of a Rapid Transit Railway Differ from Those of a Surface Line Because of the Arduous Operating Conditions—Organization of the Interborough Rapid Transit Company and Duties of Various Classes of Employees Are Described



Yard at East 180th Street, Borough of the Bronx, Where Trains Are Made Up. This Is One of a Number of Such Yards in Various Locations

CONDITIONS of operation on a rapid transit line differ materially from those on a surface line because of the clear right-of-way, the high speed which has to be maintained between stops, the greater traffic, operation under the restrictions as regards clearance usually inseparable with a subway and elevated railway as compared with surface operation, etc. In New York city these restrictive and arduous conditions are probably found at their maximum. For these reasons an account of the methods on the Interborough subway should prove of interest to other companies, especially those whose operation tends to become heavier in character.

Some striking examples of the volume of traffic on the Interborough Rapid Transit System in New York, the mileage made daily by its cars and the effect of the severe conditions of operation on the maintenance of its equipment were published in the first part of an article in the issue of this paper for March 19, describing the maintenance practice of the Interborough company. There are still other conditions which make its methods of dispatching and operating trains notable. Some of these will be briefly mentioned:

The Interborough Rapid Transit Railway is the only rapid transit railway operating ten-car trains in regular and continuous service.

It has the largest number of miles of rapid transit track and the largest number of miles of subway track in the world.

It is the only rapid transit railway employing in train service an average of materially less than one trainman per car.

Including the Manhattan division, it carries more than 1,000,000,000 revenue passengers per year, which is considerably in excess of any other rapid transit line.

New York City is the only city with any considerable amount of four-track rapid transit railway, two tracks being used for local service and two for express.

New York is the only city in which rapid transit trains are operated continually at maximum speeds of 45 m.p.h. on as close a headway as less than two minutes.

It is needless to say that very few of the passengers on the subway trains of the Interborough Rapid Transit Company realize the elaborate organization required to give this transportation service or the extensive precautions in use to insure the safety of the passengers. It is probable that even among railway men there is not a full conception of the methods used by the transportation and other departments to keep in operation the subway trains which most of these railway men use as passengers when they visit New York. It is the intention of this journal to publish several articles relating to a number of these different matters, notably the organization of the transportation department, the systems of lighting, ventilation, pumping, emergency block alarms, telephones for regular and emergency use in the subway and signaling, and the system of multiple-

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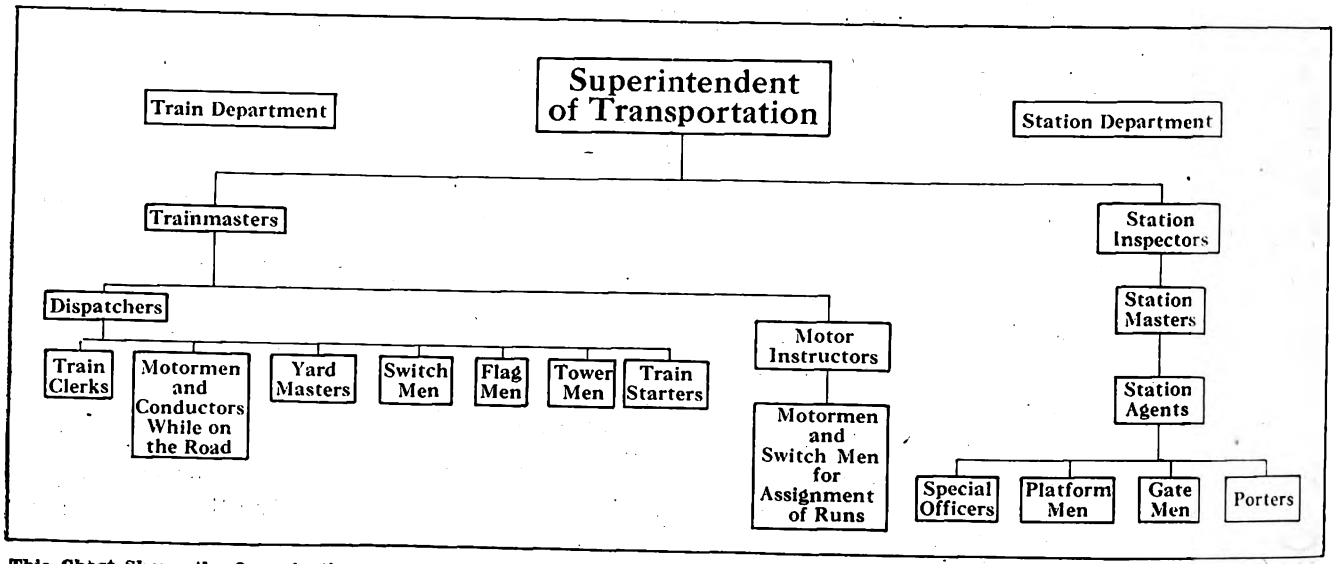
unit door control. Several articles on the inspection shops and maintenance practice have already appeared.*

The present article will describe the organization of the transportation department and the method of dispatching and checking train service.

Duties of Superintendents and Trainmasters

For purposes of operation the transportation organization on the subway division of the Interborough Rapid Transit Company is kept entirely separate from the elevated division, and the company has a superintendent of transportation and a transportation department for each division. Each of these superintendents reports directly to the assistant to the president and general manager.

On the subway division, which is the division being considered in this article, the transportation department is divided into two sub-departments, namely, that for the operation of trains and that for the direction of passenger stations. Both of these departments are in charge of the superintendent of transportation. His immediate assistants in the operation of trains are the trainmasters and in the direction of passenger stations are the station inspectors, as shown in the organization chart. This article will first outline the department in charge of the operation of trains.



This Chart Shows the Organization of the Transportation Department of the Interborough Rapid Transit Company for Subway Service

There are two trainmasters, one for day service and the other for night service, each with an assistant known as the assistant trainmaster. They exercise a general supervision over and are directly responsible for all employees connected with the train service and see that the trains move regularly. In case of accident or serious detention to trains they are expected to go at once to the place of trouble and assist in removing the cause.

Switchmen Take Trains from Yards and Deliver Them at Terminals

In the operation of the trains on the subway, the cars are not taken from the carhouses in the way that is usually followed on surface lines. There the crew reports to the carhouse and takes the car out from that point as a terminal. In the subway operation the crews, instead, report at a terminal, such as 242d Street or Woodlawn (two northern terminals), or at some intermediate station which is the terminal of a run, like Dyckman Street. They report there to the starter and begin their runs there.

The work of taking the cars to these terminals and putting them into their berths preparatory to a run is conducted by a different class of men, called "switchmen." This is necessary because the trains are made up of cars which may be on one track and may be on another track of the yards or carhouse. Besides making up the trains and taking them to the terminal platforms, the switchmen take the trains back from the terminal or other station platforms to the yards at the end of a train run. While engaged in this work, they are under the supervision of a yardmaster, but they receive orders as to the cars which they are to include in each train from the dispatcher. The dispatcher also instructs them as to the time when each particular train is to be delivered to the terminal platform ready for operation.

The standard ten-car train of the company is made up of seven motor cars and three trailers. These cars are always arranged in the following order, beginning with the north end of a train:

Motor, trailer, motor, trailer, motor, motor, motor, motor, trailer, motor.

The switchmen are uniformed, and while in the subway and between sunset and sunrise in the open they carry lanterns, so their position may be known to other employees. The maximum speed at which they are allowed to operate trains at any time is 18 m.p.h., or the series position. On sharp curves and while crossing switches, the maximum speed permitted is only 9 m.p.h. Under no circumstances are they allowed to back trains at any point.

The switchmen are responsible not only for making up trains and operating them between yard and terminal platform but also for seeing that the train is in good condition before it is put in service by the car crew. This means that before the train is taken to the terminal platform the switchmen must see that the air brakes have been tested, that the safety gates have been properly locked, that the overhead door-control operating switches are in the proper position, that the train-line jumper is properly inserted between the cars and the cover down over the jumper plug, that the indi-

*See ELECTRIC RAILWAY JOURNAL for May 3, 1924; Aug. 16, 1924; Aug. 30, 1924; March 21, 1925.

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cation jumper is properly inserted between all cars, that the indication short-circuiting plugs are inserted in the front and rear ends of the trains only, that all safety chains are connected properly between cars, that the bell cords are properly connected through the cars and in working order, that the motorman indication tests O.K. from the operating control on both ends of the train, that the battery switches are cut in, and that all other apparatus is in good condition.

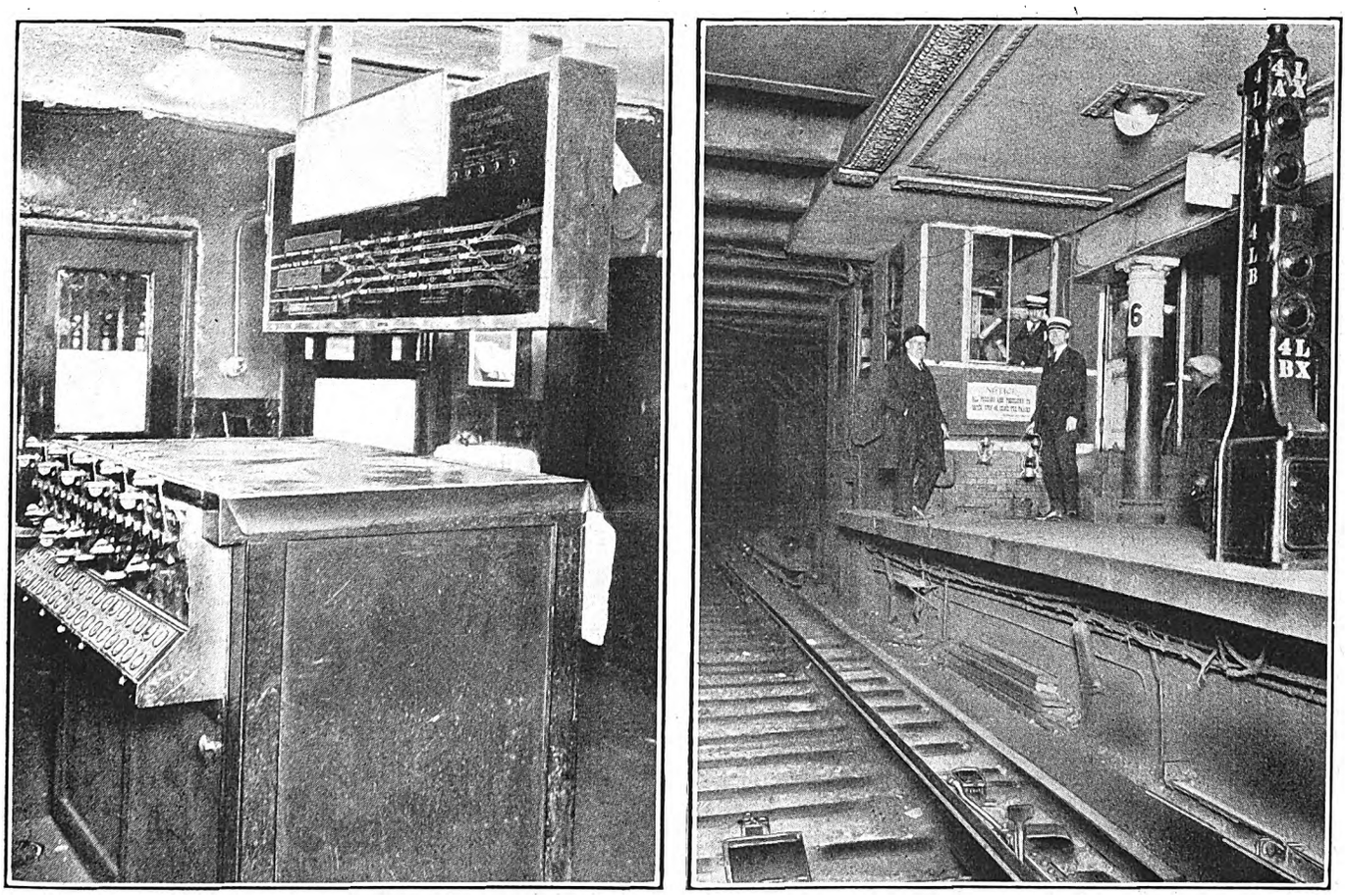
Switchmen are also particularly enjoined to watch for defects in switches, signals and car equipment, especially during cold and stormy weather. They are in a good position to do this because they operate their trains slowly, and as they bring their trains into a station they can report promptly any defect noticed before their train receives passengers. The switchmen report to the dispatcher before going to work as well as when leaving work.

the position to an extra and submits a record of the absence to the train dispatcher each day.

Starters at intermediate and terminal points also promptly report to the nearest terminal dispatcher and to other intermediate starters all unusual intervals between trains, and under the direction of the dispatcher they regulate the train movement and restore the trains to their regular intervals. Starters are also authorized to take charge at all unusual occurrences in train service in the vicinity of their stations in the absence of their superior officer, though at once notifying the superintendent, trainmaster or nearest train dispatcher of the event.

Train Dispatchers Turn Back Trains at Crossovers to Avoid Gaps

Train dispatchers are distributed along the line and each dispatcher has direct charge of the movements



At Left—Illuminated Chart, Showing Position of Trains, in Switch Tower at 33d Street Station, West Side Lines. At Right—Dispatcher's Office at the North End of the 96th Street Station, West Side Lines. One of the Automatic Trips Is Shown Just Outside the Rail Near the Bottom of the Picture

As the switchmen are held responsible for the good condition of the trains as they are brought into the terminals and turned over to the car crews, their names also appear on the train sheet.

Starters Regulate Train Movement

There is a starter at every terminal station where trains are crewed. They have charge of receiving the empty train from the switchmen and turning it over to the crew. They see that these men are in proper condition and at their posts on the train when the train is ready to start, and in the absence of a train clerk, they ring the terminal bell to start the train. In the case of absence of a conductor or guard, the starter assigns

of trains within his section and of all transportation employees while in that section. Thus, on the Broadway-Seventh Avenue line there are six locations where dispatchers are on duty at all hours of the day and night, one eighteen-hour dispatching point and one nine-hour location. The dispatchers report to the superintendent, trainmasters and assistant trainmasters.

The dispatchers watch the operation of trains, and if there is any gap or serious delays in the train service they report the fact by phone to the trainmaster, who has authority to order trains turned at crossovers to avoid blockades on the entire line.

Train dispatchers at terminals also have charge of the yards and sidings at those terminals. At such points,

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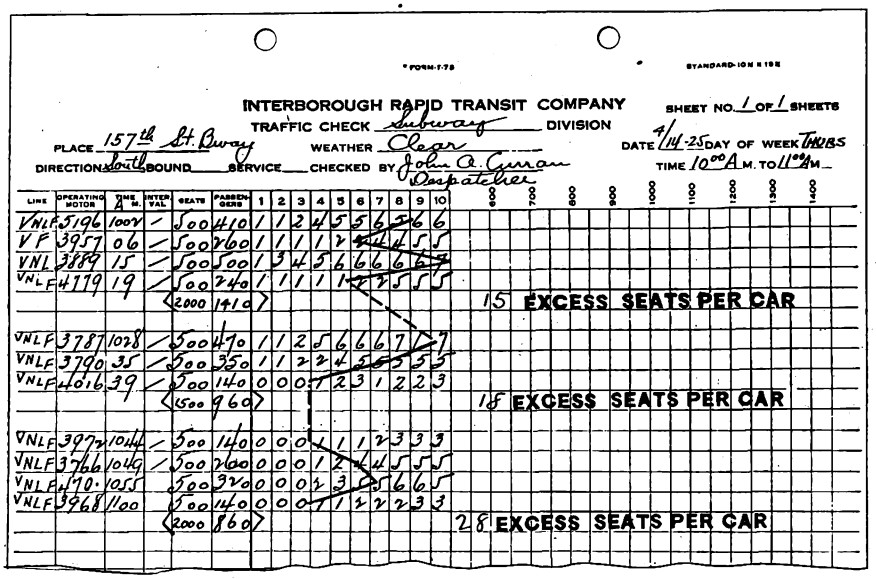


INTERBOROUGH RAPID TRANSIT COMPANY

TRAFFIC CHECK Subway DIVISION

PLACE 157th St Bway WEATHER Clear DATE 4/14-25 DAY OF WEEK THURS

DIRECTION South BOUND SERVICE CHECKED BY John A. Curran Dispatcher TIME 10:00 A.M. TO 11:00 A.M.

LINE	OPERATING MOTOR	TIME M.	INTERVAL	SEATS	PASSENGERS	1	2	3	4	5	6	7	8	9	10
VNLF	5196	1001	/	500	410	1	1	2	4	5	5	6	6		
VF	3957	06	/	500	360	1	1	1	1	2	4	4	4	5	5
VNL	3889	15	/	500	500	1	3	4	5	6	6	6	6	6	7
VNLF	4779	19	/	500	240	1	1	1	1	2	2	5	5	5	
				2000	1410										
VNLF	3787	1028	/	500	470	1	1	2	5	6	6	6	7	7	
VNLF	3790	35	/	500	350	1	1	2	2	4	5	5	5	5	
VNLF	4016	39	/	500	140	0	0	0	1	2	3	1	2	2	3
				1500	960										
VNLF	3972	1044	/	500	140	0	0	0	1	1	2	3	3	3	
VNLF	3766	1049	/	500	260	0	0	0	1	2	4	4	5	5	5
VNLF	4170	1055	/	500	340	0	0	0	2	3	5	5	6	6	5
VNLF	3968	1100	/	500	140	0	0	0	1	1	2	2	2	3	3
				2000	860										

15 EXCESS SEATS PER CAR

18 EXCESS SEATS PER CAR

28 EXCESS SEATS PER CAR

Form Used by the Traffic Checkers in Counting Traffic. The Graph in the Form Is Plotted by the Staff in the Traffic Bureau After the Report Is Received

also, they have charge of the making up of trains in the sense that they instruct the yardmaster of what cars to use in train makeup and how they are to be placed. They also have supervision of the starters at these points and see that the motormen and trainmen are ready for duty at the prescribed time and have all the time-tables, signals, lamps and other fixtures required by the rules for the operation of their trains.

Train Clerks Check Headways

Each dispatcher has in his office a train clerk who keeps a record of the number of each car arriving and departing from his station, with the route, arriving time, leaving time, etc. The records of this kind made at a terminal station show also the names of the conductor and motorman of that train and also the names of the switchmen who deliver the train at the terminal. A typical record of this kind is reproduced below.

The train clerks at points other than at terminals keep a similar record except that they do not fill in the names of the car crews.

Copies of these train sheets, as prepared at a terminal station, showing the numbers of the cars making up each train, are sent to the mileage department at 147th Street and Lenox Avenue. At the mileage department records are kept of the mileage of each car, and as a car approaches the mileage at which it is due for inspection the number is sent to all dispatchers and trainmasters. Such a list is submitted to these officials each day, giving the exact number of miles of those cars approaching a high mileage. These cars are then marked on the train sheet by the dispatcher for removal the following day by the switchmen so that they may be sent to one of the inspection shops.

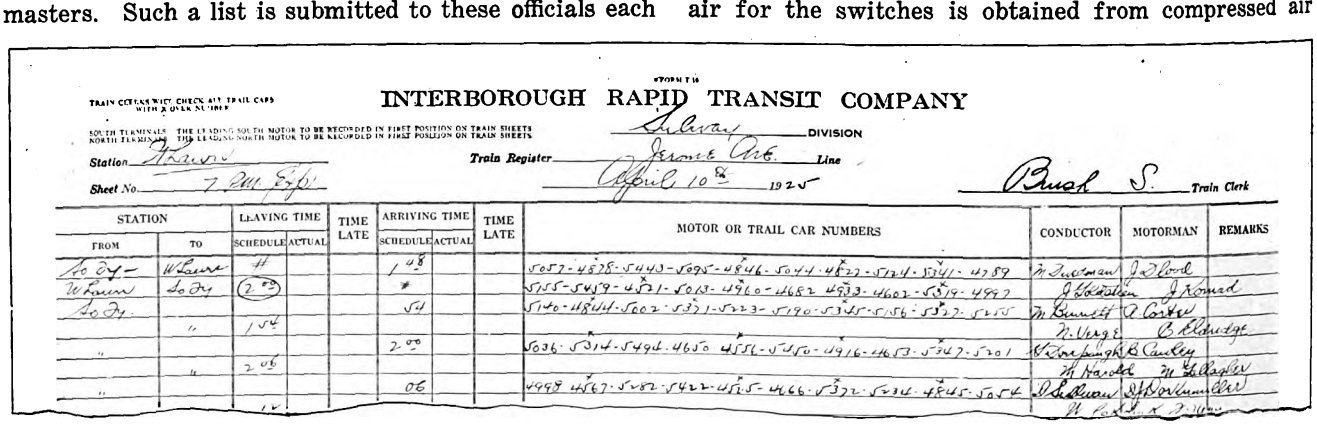
Towermen Control Switches

The towermen are responsible for the safe passage of trains over the switches in their charge. They are under the immediate supervision of the trainmasters of the division to which they are assigned and they obey all orders and signals in relation to the movement of switches and signals and the movement of trains given by the dispatcher on their section.

In the open portions of the subway they occupy towers commanding a good view of the track, as on steam railroads. These towers are not illuminated at night, as light would interfere with the vision of the signals and approaching trains by the towerman. In the subway the towerman often occupies a portion of the dispatcher's office.

In the most important signal towers there is an illuminated board, made of a frame of ground glass, on which the routes in the neighborhood of that station are painted. Along each route is a series of lights which show red or green on the board. The board is connected automatically to the various signal sections in the track, so that a clear section of track will show by green lights on the board and the presence of a train on a section will be shown by red lights. The normal indication of the interlocking home signals is "stop" and of distance signals is "caution." The signal levers are kept in the position giving these indications except when the signals are cleared for immediate train movement. Hence when a train enters its berth at a terminal station the signals are set against its leaving the station until its time of departure, as determined by the dispatcher. When the leaving time arrives, the dispatcher notifies the towerman to set the signals and switches for the departure of the train. This message is sent by an electric annunciator.

The track switches are operated by air, controlled by electric circuits and arranged by interlock so that a switch cannot be thrown unless the signal is correct and corresponds to the position of the switch. Compressed air for the switches is obtained from compressed air



INTERBOROUGH RAPID TRANSIT COMPANY

Subway DIVISION

Station Harlem Train Register Jerome Ave. Line

Sheet No. 7 PM Exp April 10th 1925 Train Clerk

STATION FROM	STATION TO	LEAVING TIME SCHEDULE	LEAVING TIME ACTUAL	TIME LATE	ARRIVING TIME SCHEDULE	ARRIVING TIME ACTUAL	TIME LATE	MOTOR OR TRAIL CAR NUMBERS	CONDUCTOR	MOTORMAN	REMARKS
So Ferry	W Farms	11			1 48			5057-4878-5443-5095-4846-5044-4827-5124-5341-4789	M Sherman	J Flood	
W Farms	So Ferry	(2 03)			"			5155-5459-4531-5013-4960-4682-4933-4602-5519-4997	J Sheridan	J Konrad	
So Ferry	"	1 54			54			5140-4844-5002-5371-5223-5190-5345-5156-5327-5155	M Burnett	A Corbett	
									M Verge	C Eldredge	
"					2 00			5036-5314-5496-4650-4556-5450-4916-4653-5347-5201	M Fenlough	B Cauley	
	"	2 06							M Harold	M Kaplan	
"					06			4998-4567-5482-5422-4515-4466-5372-5316-4845-5054	J Sullivan	J Schumacher	
		17							M Foley	J Hines	

Upper Part of Train Sheet, Filled Out with Car Numbers, Names of Motormen, Etc., as Used on the Interborough Subway System

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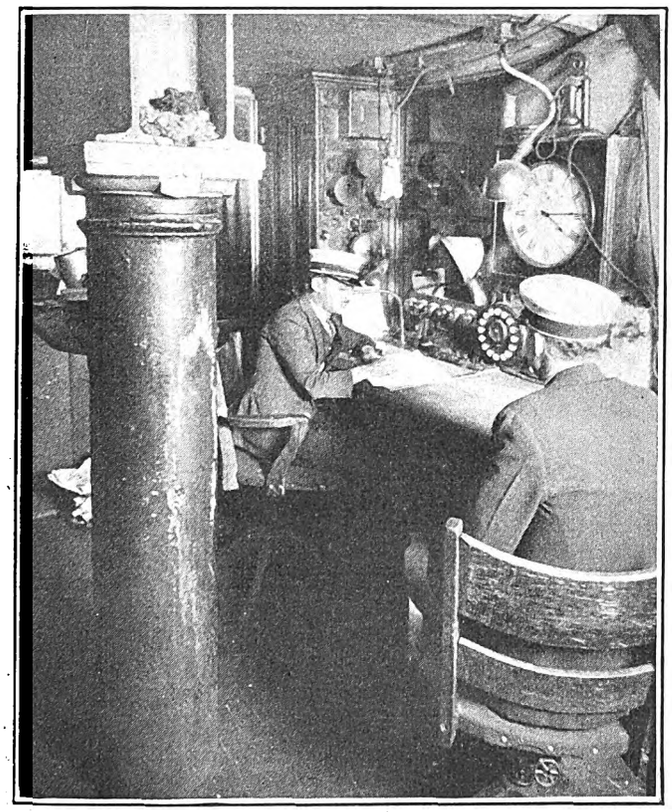
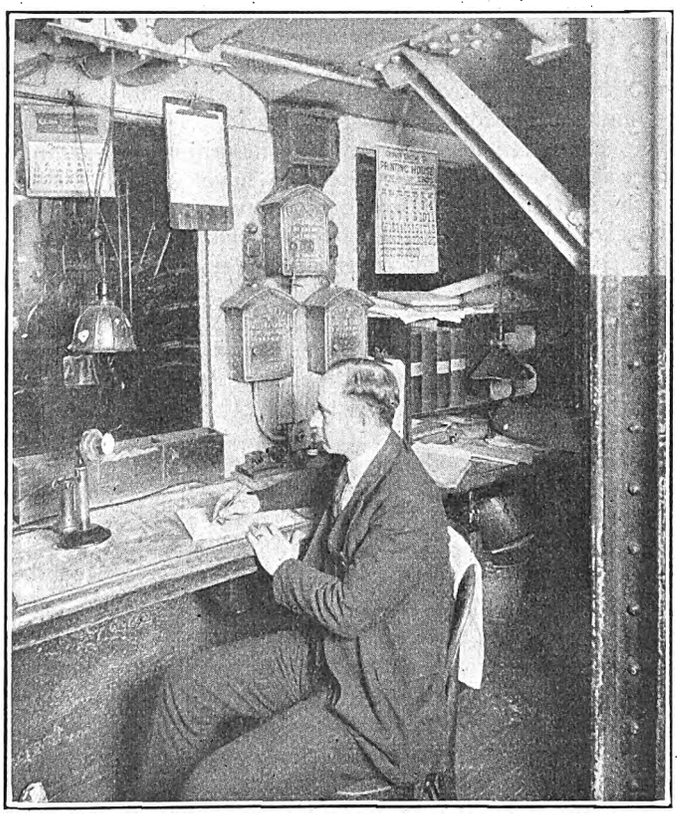
lines, supplied with air from compressing stations at different points and is carried in the subway at a pressure of from 65 to 70 lb. The electrical circuit to operate these compressed air valves is supplied through a storage battery at 20 volts. Edison alkaline storage batteries are used. There are two sets of batteries in each dispatcher's office, with fourteen cells in each set, each cell supplying about 1½ volts. One of these sets is charging while the other is discharging, and they are alternated each day.

Each towerman's office is equipped also with a stockroom of signal supplies. These include a supply of all kinds of wire suitable for signals and tagged with tags of different colors and numbers to indicate exactly where they go. There is also a variety of lamps, kerosene, electric, etc. A feature of the practice of the company is that lamps carried by the signal men are fitted with a green roundel, while all others carry a red or white roundel. This is to indicate the men who have authority in regard to the signals.





At Left—The Interior of the Dispatcher's Office, 96th Street Station, West Side Lines. At Right—The Train Clerk's Office at the Same Station. The Position of the Train Clerk Is Such that He Can Observe and Make a Record of the Numbers of All Cars as They Pass on the Tracks in Front of Him

TRAINMEN

The trainmen report fully equipped to the starter at least ten minutes before the scheduled time for starting, or as much earlier as may be required. The rules also require them, if obliged to be absent on account of sickness or other unavoidable cause, to notify the motor instructor by telephone or letter at least two hours before reporting time.

Before leaving the terminal station, the motorman must test the air brake by placing the brake valve in service position to make certain that both the pneumatic brake and the electro-pneumatic brake are in good condition. He then observes the fall of the black hand on the air gage to determine the length of the brake pipe. Next he places the brake valve in full electric release position and observes the rise of the black hand and the fall of the red hand on the air gage to determine the number of cars in the train or the length of brake pipe and main line pipe. He then moves the electric brake switch to the "on" position and immediately back to the "off" position, listening for the exhaust of the air from the emergency magnet valve in the cab. He then closes the switch, but runs with caution until a running test of the electro-pneumatic brakes is made.

Motormen are also responsible for seeing that their front and rear markers are properly set and lighted. They hand in at the terminals at the ends of their runs time cards showing the amount of time made, actual reporting time and leaving time. These times are capable of being checked and are checked against the coasting clock record, as each trail car is equipped with a coasting clock.

The general responsibility for the train is on the conductor and orders in regard to the general operation of the train are sent to him. He is responsible, for instance, for seeing that hand brakes are let off before the train starts from the yard or siding, that the tail lights are properly set and lighted, that the safety gates between the cars and at the end of the train are kept properly locked, that the bell and bell cord are in proper working order throughout the train before it starts, that the trainmaster or dispatcher is notified promptly of any defects which interfere with the proper and safe working of trains, etc. He is also directly in charge of the passengers and is responsible for seeing that they are discharged at the nearest station in case a train is disabled, that unruly passengers keep order or are ejected, and similar duties. In cases of emergency the conductor has authority to give the motorman orders to

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skip stations, but he must make a written report to the dispatcher of all stations skipped.

The guards are under the direction orders of the conductor. It is their duty to operate the door switches, announce stations and assist the conductor in his general duties in caring for the safe operation of the train. The rear guard also has the duty of protecting the rear of his train by going back with flag and lantern when his train comes to a stop at an unusual point where it is not protected by signal.

Maximum Speed of Trains Is 45 M.P.H.

The maximum speed permitted to trains in the subway is 45 m.p.h., but this is not allowed when the cars are descending heavy grades or while passing any switch or frog or while rounding any curves. The speed is reduced to from 9 to 20 m.p.h. over switches, to 20 m.p.h. while passing the shafts of the river tubes, and to 35 m.p.h. at all other points in the tubes under the river. The reduction in speed while the train is passing tube shafts is due to the fact that employees may be engaged at work at those points.

Another precaution used while the trains are making the passage under the river is to have at least 60 lb. to the square inch of brake pipe pressure. Motormen and switchmen are required to see that the gage is at this point before they enter an under-river tube.

Station Employees Collect All Fares

Another division of the transportation department also under the direction of the superintendent of transportation, as shown on the chart, is the station department. The chief officers in this department are the station inspectors, who report to the superintendent of transportation. There are four station inspectors, two for day duty and two for night. They have charge of all station masters, station agents, platform men and porters, and also of the gatemen at the few stations at which turnstiles are not used but tickets are sold.

The system is divided into zones, each directly in charge of a station master, who is responsible for seeing that the stations within that zone are kept clean and in order and that all station men on their stations perform their duties, though these station men report to and receive instructions from the station inspector rather than from the station master. The station agents are the fiscal officers of the stations. While under the immediate direction of the station master, they report to the treasurer of the company in regard to the cash received and to the comptroller of the company as to their tickets and turnstile accounts. They are also responsible, in the absence of a station master, for seeing that the ticket offices, station room, platform, stairways, etc., are kept clean. The station agents are provided with safes to accommodate the funds received by them. These funds are collected each day by representatives from the treasurer's department who give receipts to the agents for the amounts of money collected.

A great deal of this money, of course, is in small denominations, and agents are instructed to give this out in change, as far as they can, without giving offense, to the company's patrons. They are also authorized to supply banks, trust companies, business houses and local tradesmen of established reputation with coin in exchange for currency, but they are not allowed to deliver such coin themselves or to send it by any employee of the company or to allow it to leave the booth until the currency has been delivered.

The primary duty of the platform men is to serve passengers and speed their movements onto and off trains during train stops. When a train arrives at a station these men stand at the car doors and see that no passengers enter until those desiring to disembark have done so. After the passengers have boarded the trains, they assist in closing the doors and see that all doors are properly closed before the train leaves the station. If the train should be delayed, they find out the cause and immediately notify the station master or station agent.

Traffic Department Checks Loading

As on all large properties, there is a traffic department in charge of schedules and traffic check. The traffic checkers and the schedule makers are under the general direction of the superintendent of transportation, though all schedules have to receive the approval of the general manager of the company before they can go into effect. They also have to receive the approval of the New York Transit Commission.

INTERBOROUGH RAPID TRANSIT CO.

CY JPS — SUBWAY DIVISION — TELEGRAPH SERVICE

FROM SUPT.

TO MR.GEO.KEEGAN, ASST.TO PRES.& GEN.MGR. — April 3, 1925. 19 — TIME 9:25 A. M.

DATE: Friday, April 3, 1925 — TIME: 8:21 AM express
FROM: 180th Street East — TO: Atlantic Avenue

Detention: 7 mins.at Mott Avenue at 8:41 A.M.

Conductor Benedetto, Motorman Van Erde

DETAILS:

As train was pulling out of Mott Avenue station Train Clerk Finlay noticed a very bad flat wheel on 4517 (6th car). He immediately instructed Towerman Van Orden on duty to trip train and Van Orden did so, tripping operating motor 4615 on signal 2-L, stopping train at crossover. On investigating found a 3" flat on 4517. Trip was reset and train proceeded but ordered to discharge passengers. On arrival at 125th Street all passengers were discharged and train was laid up in spur at that point.

Block on Mott Avenue 8:45 AM
Cleared 8:48 AM

ALM

Form Used for Reporting Delays to Trains

The traffic checkers move constantly about the system under instructions from the trainmaster and count the loading of cars and headway of trains on both local and express tracks. When counting traffic, they are stationed at the departing end of a station, so as to count the passengers on the cars as they pass the traffic point while the train is under acceleration. The form used by them for recording these observations is illustrated on page 920.

The first vertical column in this form calls for the line or route. The next column calls for the number of the first car in the trains passing the observation point and the next column the intervals between trains. The next two columns call for the total number of seats in the train and the total number of passengers. The figures of these two columns are calculated from the figures in the following ten columns. These show the number of passengers (in tens) in each of the cars of the train. The maximum length of train in the subway is ten

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cars, so there are ten columns. Each car has 50 seats, so that a car with all seats occupied and no standing passengers would be marked a 5 in this column; a car with twenty passengers, a 2; a car with ten standing passengers, a 6; a car with twenty standing passengers, a 7, etc. The traffic checkers have become very expert and can readily tell within ten passengers the load on each car and record these numbers as the cars pass their station. From these figures, the figures in the column headed "Seats" and "Passengers" can easily be calculated.

The practice in checking traffic is to divide each period into periods of twenty minutes. Thus, in the example shown, there are three periods of twenty minutes each, from 10 p.m. to 11 p.m. The number of seats and the number of passengers in each twenty-minute period are tabulated on the blank line at the end of that period. In the first twenty-minute interval shown, there are 2,000 seats and 1,410 passengers.

In this form, the report is returned by the traffic checker to the office of the traffic department, when each period is marked with the words "Excess passengers per car" or "Excess seats per car," as shown.

The cross-sectioning at the right-hand side of the sheet enables the traffic department to chart the load per train. These charted lines and all of the lettering at the right-hand side of the chart are put on in the traffic department, while the figures at the left side of the report are put in by traffic checker.

The traffic checker enters these figures in pencil with his sheet attached to a board and a watch exposed so that he can easily get the time.

Mr. Doherty Puts It Up to Toledo

In Correspondence with the City Council of Toledo, Henry L. Doherty Points Out Advantages of a Larger Proportion of Ownership of the Local Railway by Toledo Residents—He Also Suggests the Railway Might Be Willing to Shut Down Temporarily to Give Buses a Fair Trial, if the Council So Desires

RAILWAY affairs in Toledo have not run so smoothly as was hoped when the Milner service-at-cost ordinance was adopted there some four years ago. This franchise permits a fare to cover operating expenses and a return on the investment, but does not forbid competition. Since the first of the year there has been an even more general discussion on traction matters. There were complaints in the City Council that the service was not adequate, that the fare was too high and that the service could be given perhaps better by buses. In the meantime, a franchise for 25 years for the operation of buses in a city-wide system was requested by the City-Wide Motor Coach Company. The charge was to be 5 cents, with a 1-cent charge for transfer.

Henry L. Doherty, speaking for the Community Traction Company, has made several offers to the authorities to help solve the question of better transit for Toledo. One was that the city employ an outside expert to make a transit survey and study, and he offered personally to finance such a study up to $25,000. A second suggestion, made about a month ago, was that the company issue an 8 per cent preferred stock to raise $2,000,000 for needed improvements. He agreed to take $500,000 of this stock if the citizens of Toledo would subscribe for $1,500,000. His purpose, as expressed in his letter, was to enlist the active participation of the representative citizens of Toledo in a comprehensive transportation system. According to his proposition the control and management of the property would be transferred to this group of new stockholders. Neither the Board of Street Railway Control nor the City Council, however, was in favor of either of these plans.

Mr. Doherty Replies to the Council

Mr. Doherty's reply, which brings the situation up to date, was sent on May 29. After explaining that he would much prefer to make a personal presentation, but was not able because of his business affairs, he outlines his reasons for his suggestion that the control of the company be taken over by Toledo citizens and gives some of the reasons why better results had not been obtained from the service-at-cost franchise. In the first part of his letter he quotes from another letter, written by him recently to Mr. Goodwillie of the Board of Street Railway Control. This letter, slightly abstracted, follows:

Abstract of Letter from Mr. Doherty to Mr. Goodwillie

I read in the Toledo papers the report of the Board of Street Railway Control. I cannot concur in many of the statements made in that report, but I am not writing you this letter in your official capacity but merely as a brother engineer.

It has always been my contention that there is no excuse for engineers to disagree on any of the matters they are expected to know about, and also that engineers should be able to disagree with each other without giving offense and be able to sit down and talk things over until an agreement is reached.

I think practically everybody in Toledo is inclined to deal with this street railway matter as opportunists, and many of the things proposed would make it impossible ever to have a proper transportation system for the city of Toledo.

I hold:

1. That Toledo must have a comprehensive transportation system.
2. That this system must have a credit that will permit it to secure capital to enable it to keep pace or even anticipate the growth of the city.
3. To command capital it must operate at a profit and be reasonably free from jeopardy.

Therefore if Toledo must have a transportation system, and this system must have credit, then the citizens of Toledo should be willing to do whatever is necessary to create these conditions, and having done so there is no reason why the preferred stock of the company should not be both a sound and an attractive investment.

Let us assume for the moment that your water company was privately owned rather than municipally owned. What would the city gain or lose by compelling the company to work under conditions which made it impossible to earn a profit? The water company under this condition would be robbed of all credit and would be unable to raise the funds necessary to extend its mains or to enlarge its facilities from time to time as the city grew.

While we are operating a few one-man cars we are able to do this only by sufferance and the city has forbidden us

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to use one-man cars, which is one of the most effective methods of reducing railway costs.

In my letter of the 5th to the Mayor I proposed turning over control to a group of Toledo citizens and wanted to make that group so representative that it would carry universal public confidence. If this group of men can get the co-operation of the City Council and the citizens, there can then be no question of the soundness of the investment.

Your suggestion that new capital should have priority over the present bonded indebtedness is, I think you will admit, under the plan I proposed, eminently unsound. I proposed to turn over the control and management of the street railway company to Toledo citizens on the theory that they would be owners of the equity. If they put their money into the company as a lien ahead of the present bonds they would merely become creditors—and certainly neither you nor any other sound business man would advocate the control and operation of a company by creditors, when their investment would not be jeopardized by bad management or anything else, until junior capital to the extent of four or five times their obligation had been wiped out. An equity holder must operate a property in the interest of all the security holders, and it is only the equity owners of a property who can be reasonably expected to have the interest necessary for the control and management of a property.

You say the service must be improved. This will require a rearrangement of the system and new capital. At the time when this should have been done the city refused to act, and some who opposed this action were prompted to do so because the owners of the road would receive an 8 per cent preferred stock for the capital they would advance. Now we are told that this same stock is not a sufficiently sound or attractive investment for the citizens of Toledo.

You speak of its being necessary to lower the fares. Except as this is done by increasing patronage and reducing operating expenses, a rearrangement and an extension of the system, requiring still more capital, it means wiping out all earnings in excess of operating expenses, and I am inclined to think that a rate of fare might be insisted upon that would even leave an operating deficit. If the fare was lowered to the point where there were no earnings left for either bond interest or dividends on stock it would not reduce the fare by even a single penny.

If the road can earn nothing for its owners, what incentive can there be for anybody to furnish new capital that you say should be provided for "adequately extending the service"?

If our operations have been faulty and the fare has reached the present point due in any way to us, then this is at least answered for the future when we offer to turn over the management of the road to a representative group of Toledo citizens if they will join us in providing the capital required to give a proper and adequate transportation system.

I think you will agree with me that Toledo could not possibly depend entirely upon buses for her transportation system and that Toledo must have a street railway system. It is true that the operating costs per mile for a bus is less than for a street railway, but it is also true that when traffic is heavy the cost of carrying the passenger is much greater with a bus than with a street railway system. It is also true that where the traffic is very light, and at the hours of the day when few people are riding, it costs more to drag around a big street car than it does a lighter bus. The best system available today is one in which the street cars are used as far as possible to handle the heavy and dense traffic and buses for other traffic. The buses should be entirely supplemental to the street railway system and not in competition therewith. What buses are operated should be operated by the Community Traction Company, and if the Community Traction Company is controlled by the representative citizens of Toledo, it seems to me that this should be the greatest insurance to the citizens of Toledo that they will receive a transportation service as good as it can be made and at the lowest possible cost.

If nothing is done at this time it simply means putting off the doing of something that must sooner or later be done. Toledo must have a transportation system and that system must have credit, and that means that it must operate at a profit. Anything less than this means the continuation of unsatisfactory conditions and higher expenses for transportation service rather than lower expenses. A system without credit cannot function and must periodically be resuscitated to save it from collapse.

Railway Willing to Permit Trial of Bus

After quoting from his letter to Mr. Goodwillie, Mr. Doherty continued in his letter to the City Council that both of the suggestions made by him—that of the study by an outside transportation expert, and a representative group of citizens take over the property—were prompted by a belief that possibly the gravity of the situation, from the standpoint of its bearing on the welfare of the city, was not entirely appreciated by the citizens. He said he was also convinced that whoever furnished the local service must, to do so satisfactorily, furnish the entire surface and be free from competition. Continuing, he said he noticed that two bus concerns claimed to be willing to furnish a complete city transportation bus service on a 5-cent fare, but if the Council believed this possible, or if any large element of the people of Toledo believed this possible, he feared it would be an effectual barrier to any arrangement the Community Traction Company might offer that would solve the problem. Before it can accomplish anything, therefore, these bus claims must be tested and disposed of in advance. Continuing, he said:

If you believe the city of Toledo can be served best and most economically exclusively with buses, we will agree that you should give a bus franchise to any concern you may select, and when it is ready to start operation we will suspend the operation of our cars, based upon an agreement that if the bus operations fail then they shall be ousted from the streets and we shall be given the right to resume the operation of our railway system with supplemental bus operations and without being subjected to competition, the decision as to whether the bus operations are more satisfactory and more economical than the system we propose to be determined by some tribunal mutually agreed upon. This is such a huge experiment and on such a gigantic scale that I hope it will not have to be resorted to, and I hope we can convince not only your honorable body but everybody in Toledo that the plan we recommend of a combination, co-ordinated, non-competitive transportation system made up of street railroad and bus is best for the city.

There is a vast difference between giving a transportation service and merely carrying passengers at such times and on such routes and hours when and where it can be profitably done. While most cities have recognized the folly of competitive transportation lines, nevertheless in many cities buses are allowed to operate in competition with the street railway company, yet they only operate when and where it is profitable to carry passengers and leave the street railway company to operate its cars throughout the balance of the city and the remaining hours of the day and night, even though for fifteen or sixteen hours of this period the cars are compelled to operate at a loss. We certainly intend to give this much-desired service for twenty-four hours a day just so long as it is possible, but our only recourse to protect ourselves from loss against bus competition will be to suspend operation of cars during the unprofitable hours.

After making this proposition, Mr. Doherty said that the position of the Board of Control and of the City Council seemed all in the direction of having the company bear the entire burden and make all of the sacrifices to enable these bodies to secure for the people of Toledo what they think the city should have. Nevertheless, the company is willing to make certain concessions. For instance, it would reduce the amount which the company was entitled to charge to its sinking fund to $100,000 per year, with the proviso that for every 1 mill reduction in fares, the sinking fund would be increased by, say, $10,000.

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Essential Features of Modern Electric Car Truck Design*

A Discussion of the Functions of the Various Parts of the Modern Truck, Giving Reasons for the Present Typical Design — Development of the Car Truck from Early Types Up to the Present Single and Double Trucks in General Use

By Walter S. Adams
Designing Engineer the J. G. Brill Company, Philadelphia

DESIGN of electric railway car trucks naturally falls into a series of designs of the various constituent parts, with their correlation in such a manner that they function properly and efficiently. The major parts to be considered are the wheelbase, the frame, the bolster and transom, the spring system, the brake rigging and types of wheels and axles. These will be considered in turn.

The length of wheelbase is important. A long wheelbase contributes to the steady riding of a car. The length of wheelbase which can be used is entirely dependent upon the minimum curve over which the car must operate. When a long wheelbase truck operates around a short curve, the wheel flanges bind in the rail grooves and cause excessive flange and rail wear and ofttimes derailment. The diameter of the wheels is also a contributing factor to the length of the wheelbase. The smaller the diameter of the wheels the shorter are the binding points of the flanges in the rail grooves. In practice an 8-ft. wheelbase truck with 26-in. diameter wheels will negotiate a curve just about as freely as a 7-ft. 6-in. wheelbase truck with 33-in. wheels.

While the wheelbase is very important on four-wheel cars, it is not a problem when double trucks are considered unless the car body is narrow and would interfere with the proper radiation of the wheels on a curve. A good rule to follow is to make the length of the wheelbase on a pivotal truck at least equal to the gage of the track. Keeping the wheelbase on a pivotal truck within reasonable limits allows the truck centers under the car body to be increased, giving better support for the ends of the car. On high-speed cars, where step heights are not restricted, a liberal wheelbase should be provided as it contributes somewhat to better riding at high speeds.

Strong Side Frames Are Necessary

Truck frames are subject to great vertical stresses. They must support the car body and its load of passengers and transmit the starting torque of the motors and the braking stresses. Experience of the Brill company has shown that side frames of one-piece solid forgings without bolts or rivets to hold them together are the best type. They have outlasted other constructions such as cast steel, pressed steel, etc. A number of years ago pressed plate steel side frames were operated on electric and steam railways. Apparently they failed or the maintenance was too great, as there are comparatively few now in service.

The truck bolster supports the car body and partakes of the same vertical and transverse movement, but it is necessary for the bolster to turn with the truck when entering a curve. Center or pivot plates are used to allow the truck to turn in relation to the car body. These are usually made with a pocket for a lubricant and are arranged with renewable wear surfaces. Ball-bearing center plates have been used in some instances. They perform a very useful function in allowing easy turning of the truck on curves. On irregular straight track, however, where a certain amount of stability is desired to prevent the trucks from following the irregular line of the track, they have been found so sensitive as to be objectionable, allowing the car to nose from side to side. The truck bolster is confined between the truck transoms and it is desirable to restrict the movements to and from the transom to the smallest possible amount consistent with freedom for vertical and transverse movement. Wear plates have been used for many years for restricting the movement of the bolster in relation to the transom. The Brill company, however, uses what is termed a bolster guide in place of wear plates. This construction links the truck bolster to the transoms and allows a vertical and transverse movement but maintains a constant relation of the bolster away from the transoms. The pivot where these links are connected to the truck bolster is located above the bottom of the truck center plate. This prevents the bolster from tilting over when the brakes are applied or the motors accelerated. This tilting prevails quite frequently in constructions where wear plates are used. The bolster guide construction allows perfect vertical freedom for the springs to perform their function under all conditions of service. It provides what may be termed a floating bolster.

When the brakes are applied the trucks are pulled toward each other an amount equal to the extent of play between the truck bolster and the truck transom. The frictional contact between these parts prevents the bolster from having vertical freedom, without which there will be no spring action for absorbing the vibrations set up by metal wheels running on metal rails.

The object of the bolster guide construction is to avoid this condition and allow the springs to perform their proper function without frictional contact or interference between the truck bolster and the transoms of the truck frame. This device also reduces the amount of the air brake piston travel by eliminating the usual play between bolster and transoms.

Both Coil and Elliptic Springs Are Used

The usual spring system for city trucks includes coil springs over the journal boxes to cushion the truck frame and the suspended end of the motor. Their con-

*Based on a lecture before the educational conference of the Boston Elevated Railway.

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tribution to good riding is almost negligible. The car body is supported on plate springs under the truck bolster which are usually of a full or a semi-elliptic type. These springs must be made of sufficient capacity to carry the maximum passenger load that can be crowded into a car and requires a very strong construction. Springs that are made for carrying heavy loads do not give the best results when a car is lightly loaded, and as light loads prevail the greater portion of the day, a system of springs is to be desired that will allow just as easy riding with a light load as with a heavy load. Such a system consists of a coil spring of limited capacity which is placed between the truck bolster and the plate spring referred to. Locating this coil spring between the plate spring and the car body allows it to absorb all the vibrations that pass through the heavy plate springs. This coil spring continues to act until the car has a seated load. Any additional load causes the bolster to rest on the coil spring seat, thereby putting this spring out of action. It remains out of action until the load is reduced, after which it again functions to give easy riding when the car is lightly loaded.

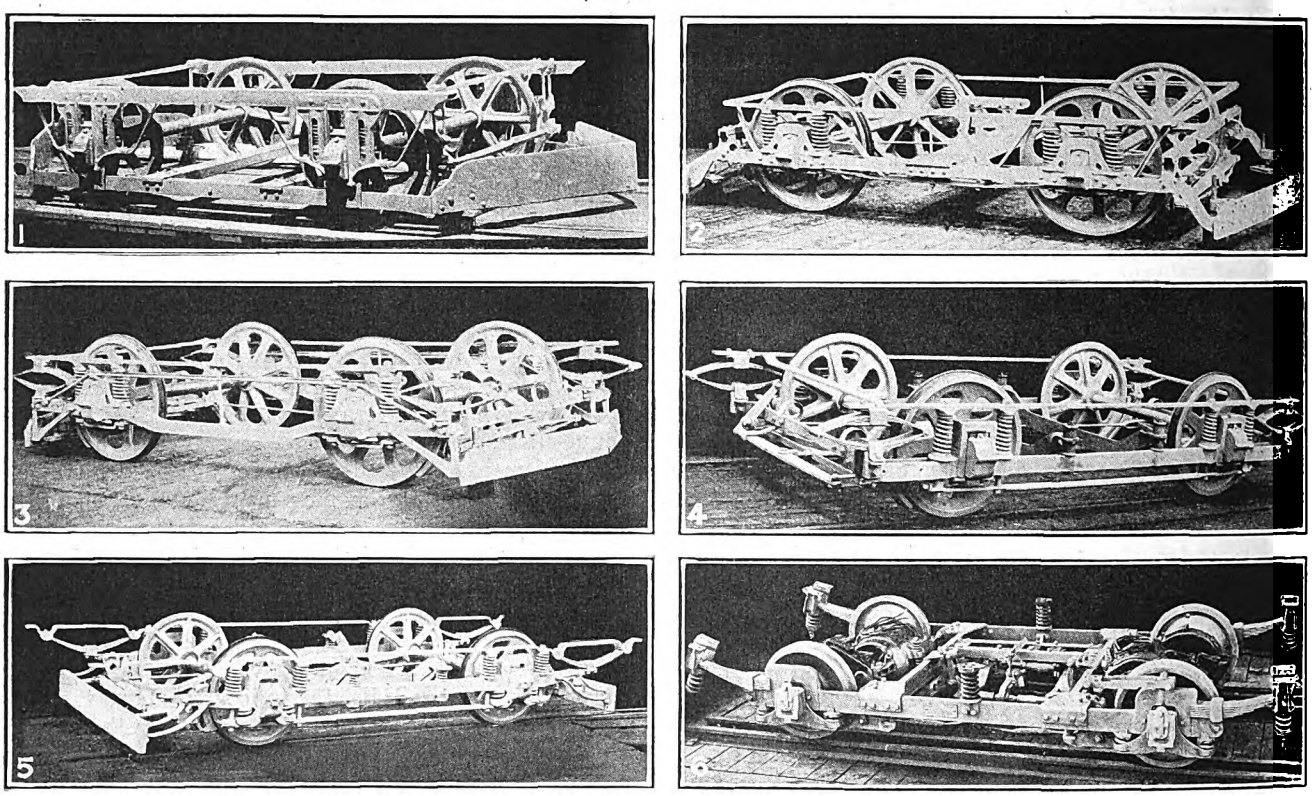
Somewhat associated with the spring system is the provision for allowing side easement of the car body when rounding curves or running on irregular track. This usually takes the form of links, one end supported on the truck frame, the other end indirectly connected to the truck bolster. These links cushion the side movement of the body. When a car enters a curve the trucks follow the rail, while the tendency of the car body is to continue on a straight line. The swing links allow the car body to be drawn back gradually to its normal relation to the truck. This is because as the links swing the car body is slightly raised. The weight of the car, therefore, acts in such a way as to restrict the swing of the links.

METHODS OF SUPPORTING BRAKE RIGGING

Brake design up to the present time provides for the use of metal brake shoes applied against the wheels. The combined pressure of all the shoes against the wheels approximates the weight of the complete car. To obtain this pressure a system of levers is used on the trucks in connection with levers on the car body. The pressure is approximately equal on all wheels except when maximum traction trucks are used, in which case the levers are arranged to give a pressure proportionate to the weight carried on the respective wheels. One of the problems in reference to brakes is to design a proper method of supporting the brake rigging from the truck frame. For many years a plain link and pin have been used for this purpose. However, as soon as a little wear occurs they become noisy and chatter. A number of different designs have been used to prevent noise and reduce maintenance.

The first design of axles for electric trucks had the check plate journal. This type of journal was used on practically all horse-car running gear. The check plate fitted into a groove in the journal and held the journal in close relation to the journal box. This was a desirable feature in view of the dust guard arrangement used in the journal boxes at that time.

As the speed and weight of cars increased, it was found necessary to use the same design of journal as on steam railroads. This has a button on the outside end of the journal and a shoulder on the inside end. Another type of journal that is used to a limited extent is a collarless journal. With this type the end of the



Representative Types of Electric Railway Trucks for Single-Truck Cars

No. 1. First electric truck, type No. 1, placed in service in 1888.
No. 2. Truck with axle box frames, type No. 7, for four-wheel cars, 1889.
No. 3. Elliptical springs used at extreme ends of frame, type No. 13, 1890.
No. 4. First solid-forged frame truck, type No. 21, 1892.
No. 5. Another solid-forged frame design, type No. 21-E, for four-wheel cars, 1896.
No. 6. Late design, with solid forged frame, for single-truck cars, type 79-E, 1924.

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bearing or the journal wedge extends down over the end of the journal to restrict the end play.

The Master Car Builders' type of journal and journal box, which is now used almost exclusively, is one of the American Electric Railway Engineering Association standards. It allows considerable end play of the journal. This is not objectionable if the rails are in good alignment, but when rails are not in good condition this end play contributes to the side swaying of the car. The combined end play of the axle from one extreme to the other approximates ½ in. However, if thrust plates are used as provided for in the A.E.R.E.A. standards, this end play can be reduced.

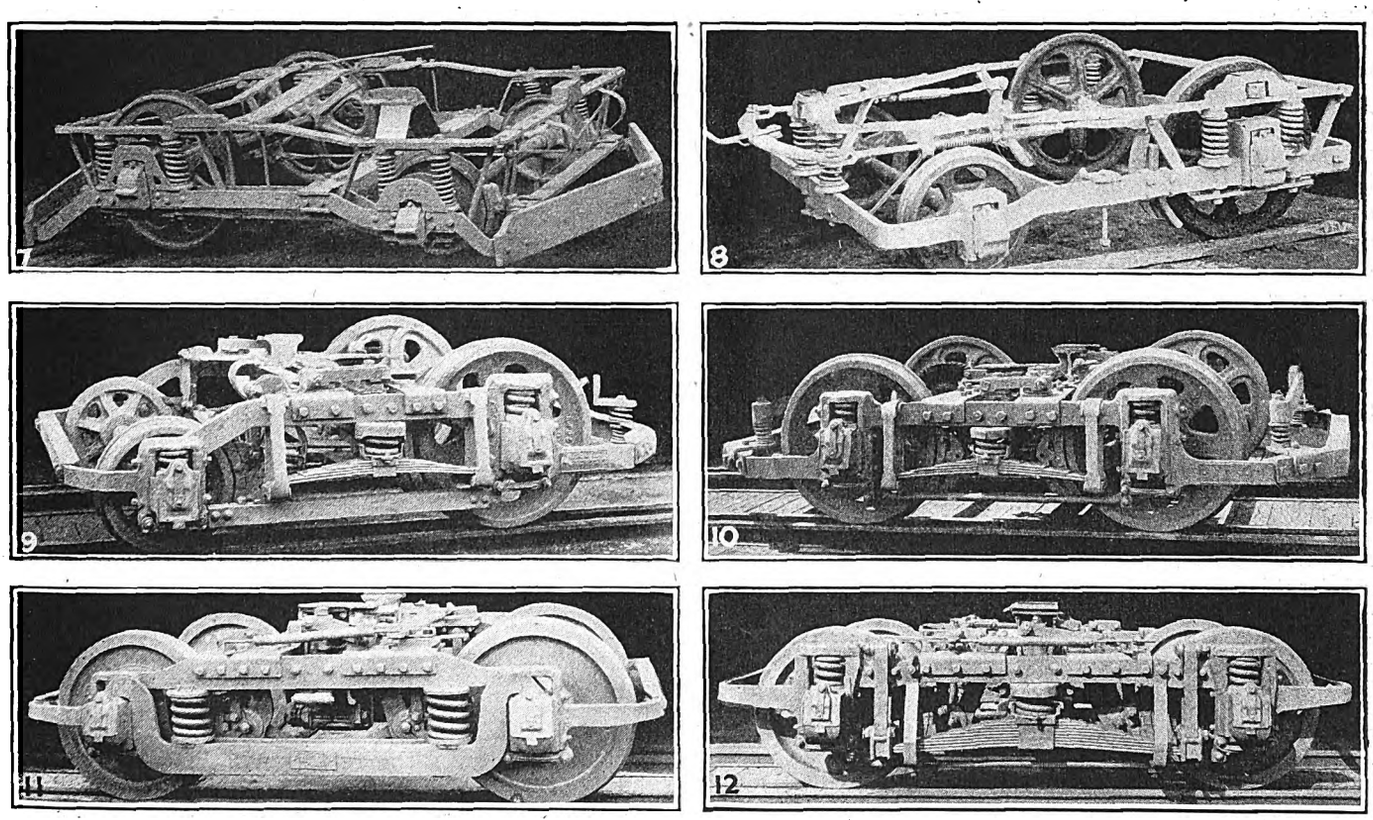
For electric railway service wheels are pressed on axles with a pressure which approximates 10 tons per inch of diameter of the bore. There is a tendency to reduce this amount of pressure as being unnecessary. Lower pressures have been found to hold the wheels tightly.

Ball and roller journal bearings have been so successful on gas motor trucks and pleasure cars that there have been repeated efforts to operate them successfully on electric cars. Automobiles have rubber cushion wheels which relieve the ball and roller bearings from road shocks and this, no doubt, contributes to their success in these vehicles. Where they have been installed on electric cars without any cushioning to relieve the metallic shocks between wheel and rail they have in large measure failed.

The Brill company has been using a rubber-cushioned steel-tired wheel on gasoline rail cars for nearly three years. These cars are equipped with roller bearing journals that have been very successful. This success can be attributed to the rubber cushion which insulates the wheel and rail contact from these bearings. Not only does this cushion wheel help the roller bearing but it also reduces the wear of the flange, as the rubber cushion is so installed that it allows horizontal as well as vertical cushioning. Many of these cushion wheels have a record of continuous service in excess of 110,000 miles.

Development of the Single Truck

The first successful electric trucks for four-wheel cars were made more than 37 years ago. At first, with the use of electricity as motive power, they were simply modifications of horse car running gears with motor equipment hung upon the car body. In 1887 John A. Brill, the youngest son of the founder of the J. G. Brill Company, invented what is recognized as the first system of electric car trucks in which the truck frames supporting the motors, brakes, etc., were independent of the car body. This development permitted railways to keep their motor and truck equipment in service the year round, as trucks and motors could be removed from under closed cars and installed under open cars, and vice versa. These first trucks were of the cast pedestal type and had a unique system of springs. Instead of two or three pairs of springs, combining both coil and plate types as are used in most modern trucks, the entire spring action was provided by one set of coil springs arranged so that two coil springs were located at the sides of the journal box under the car body attachment frames. The entire brake rigging was supported on this set of springs. As the brake shoes were subject to the action of the springs it required considerable lever movement to bring the brake shoes against the wheels when the car body was loaded.



Types of Trucks Used for Double-Truck Cars

No. 7. First maximum traction truck, type No. 11, 1891.
No. 8. Maximum traction truck with solid-forged frame, type No. 11, 1892.
No. 9. Single motor pivotal truck, type No. 39-E, 1924.
No. 10. Bolster guide-spring system and solid-forged frame, type No. 76-E, 1924.
No. 11. Designed for high-speed service, type No. 27, MCB.
No. 12. Twin swing links, solid forged frame, type No. 77-E.

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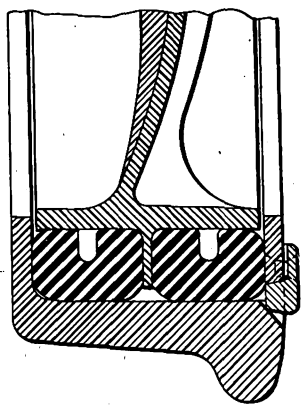
Subsequently, trucks were designed with axle box frames which rested on rubber cushions on the journal boxes. This practically rigid frame carried the brakes and free ends of the motors so that the coil spring system between the frame and the car body supported the latter only. This improved method not only eliminated the objectionable feature of excess slack in the brake rigging when the car body was loaded but also minimized the vibrations set up in the body by brake applications. In those days electric cars and trucks were short. As longer car bodies came into use there was more body overhang outside the wheels. This resulted in excessive end-to-end oscillation. To overcome this difficulty, truck frames were extended and elliptical springs were installed on the extreme ends of the frame to function in connection with the coil springs on both sides of the journal boxes. This combination of coil and plate springs, working together, increased the stability of the car body and resulted in improved riding action. Plate springs, of course, are retarded in their action by friction between the plates, whereas the coil spring is not restrained by any friction. Consequently it is quicker in its action.



Rubber-Cushioned Steel-Tired Wheel for Gasoline Rail Cars

The original axle box frames were formed of a number of parts bolted or riveted together. The severe condition of service to which these frames were subjected caused the bolts and rivets to work loose, requiring considerable attention to keep them in a serviceable condition. As early as 1892 the practice of making truck frames of solid forgings was introduced. This practice has been continued by the Brill company. With few exceptions this company uses forged truck frames exclusively. These were at first made under heavy steam hammers, but today they are produced on a set of specially installed hydraulic presses which range from 300 to 3,000 tons capacity.

Double Trucks Needed for Long, Heavy Cars

As car bodies were increased in length and weight they went beyond the limits of the ordinary four-wheel single truck, making it necessary to use double trucks, the first of which were the maximum traction type. At first this type of truck, with only one motor, was used in connection with large driver wheels and small pony or guiding wheels. The car body was supported at the side of the truck without the use of a bolster on the car body or on the truck.

One of the principal advantages of this type of truck was that it would curve between the long side steps on cross seat open cars, which were popular at that time. This was accomplished by locating the pivoting point on the truck close to the driving axle, reducing the radiation of the driving wheels so they would not interfere with the car sills or steps. On the trail end of the truck where radiation was increased small wheels were used so they could swing below the steps. This was the only type of truck that could be used interchangeably under long open cars and closed cars. This truck also permitted step heights to remain almost as low as on the smaller single-truck cars. The use of small pony wheels, as well as the single-motor feature, eliminated considerable weight. This type of truck did not have any mechanical center plate, but was guided in curving by angle plates bolted to the side sills of the car and a traveling kingbolt attached to a cross member of the car body. This type of truck, which was introduced as early as 1891, is still being produced.

The tendency toward heavy cars, particularly in cities with steep grades or hilly country outside of cities, made necessary the development of trucks having wheels of equal size and the use of quadruple-motor equipment. When the general reaction came toward smaller and lighter units of the Birney safety car type, the public, accustomed to the steadier riding double-truck cars, required a truck which would give the maximum amount of stability. This led to the development of a truck that carried practically all the weight on the extended spring base, still maintaining, however, the combination of plate and coil springs to obtain the most desirable riding qualities.

Accidents Decrease in St. Louis

DURING the twelve-month period ended March 31, 1925, the United Railways of St. Louis made a reduction of 5,642 accidents over the previous twelve months. The detailed figures follow:

ACCIDENTS FOR TWELVE MONTHS ENDED MARCH 31, 1925
UNITED RAILWAYS OF ST. LOUIS

	1925	1924	Per Cent Decrease
Collisions with vehicles	525	762	31.2
Collisions with persons	564	695	18.8
Collisions with animals	53	83	35.4
Collisions with motor vehicles	11,311	12,968	12.8
Car collisions	325	541	39.9
Car derailments	147	327	55.0
Boarding and alighting	2,140	2,541	15.8
Falls in car	885	880	.5*
Disturbances	609	936	45.6
Car equipment	45	190	76.3
Miscellaneous	2 041	3,877	47.3
Employees injured	130	210	38.1
Power plant	192	248	22.6
Maintenance of way	545	662	17.7
Shops and sheds	321	380	15.5
Electrolysis	38	41	7.3
Struck by doors	398	570	30.2

* Represents increase.

This is in spite of the fact that highway accidents of all kinds in St. Louis, as reported by the police department, increased 14.4 per cent and the automobile registration increased approximately 20 per cent.

These results, according to an article by E. J. Eastham, safety director United Railways of St. Louis, in the last issue of the *National Safety News*, may be attributed largely to a safety committee, representing all the departments of the company, appointed in February, 1924. A feature of the work carried on by this committee is the award of a prize each month to the carhouse having the best record as regards safety. To visualize the day by day accident records, a large wooden dial with two movable hands, one red and the other black, was installed in each carhouse. Each day the carhouse foreman sets these hands on the dial so that the red hand points to the total number of accidents for the cars from that carhouse up to that day of the month, while the black hand shows the corresponding total for the same month of the previous year. The slogan is, "Keep the red hand back."

The dials are so placed as to attract the attention of every employee coming into the carhouse before taking his car out, and to show him at a glance just how his division stands on accident reduction for the month to date.

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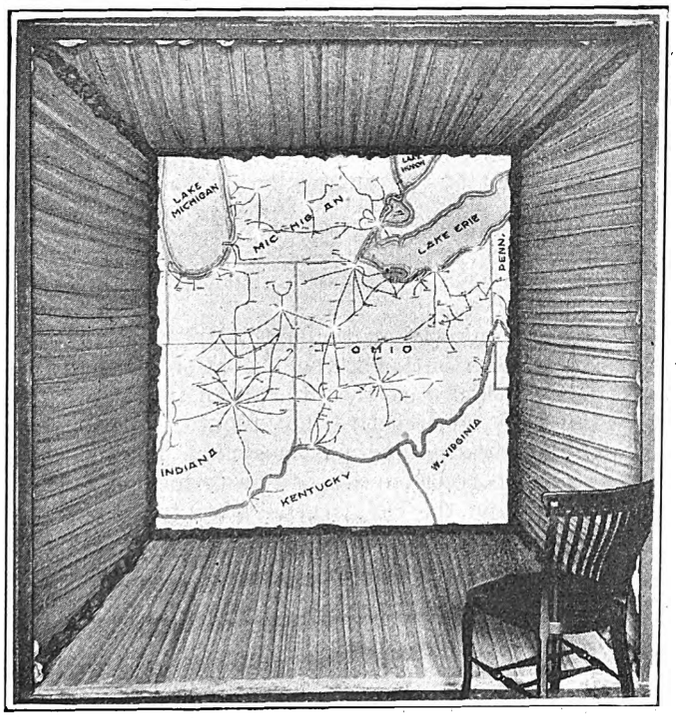
Large Electrified Map Attracts Shippers

Through Routing in Central District Shown on Large Electrically Lighted Map Exhibited at Indiana Dealers' Convention of J. R. Watkins Company

BELIEVING that an ounce of exhibition is worth a pound of talk, the jointly maintained public relations department of the Indiana, Columbus & Eastern and the Columbus, Newark & Zanesville Railways has prepared a map 8 ft. square of the traction lines of



Map Used to Show Availability of Traction Lines

Ohio, Indiana and Michigan, and displayed it before the Indiana dealers' convention of the J. R. Watkins Company, large manufacturer and distributor of household commodities, held in Indianapolis on April 10. W. R. Huffer, general agent for the companies, who designed the map, was featured on the program under the heading of an address on "The Speed of Express at the Cost of Freight."

The map was constructed of beaverboard and mounted in a purple cloth-covered beveled frame with orange borders. It presents an attractive appearance. The various cities are indicated by small electric bulbs screwed into the face of the board with the wiring on the back, the traction routes being shown by broad red lines.

As the J. R. Watkins Company distributes direct from its nine branches through more than 5,500 sales people to consumers, any display of prompt and convenient methods of routing made to these men would be highly profitable. Moreover, since the branch that supplies the Indiana territory is located in Columbus, the I., C. & E. and the C., N. & Z are in a position to move much of this material.

Here the policy of selling electric transportation as a whole, instead of playing up a particular line exclusively, has proved its value. The shipper is not interested in any particular traction line. His interest is in reaching the points he desires.

Another interesting phase of the map's career was its display before classes in transportation and advertising at the Ohio State University. On this occasion Mr. Huffer made an address on traction transportation, in which he brought out the quality of initiative and spirit of service that distinguishes the industry. This display was made in connection with a project for advertising in the University Year Book by which the students in advertising classes entered a contest in writing the copy, a prize being awarded by the railway for the best advertising suggestion submitted.

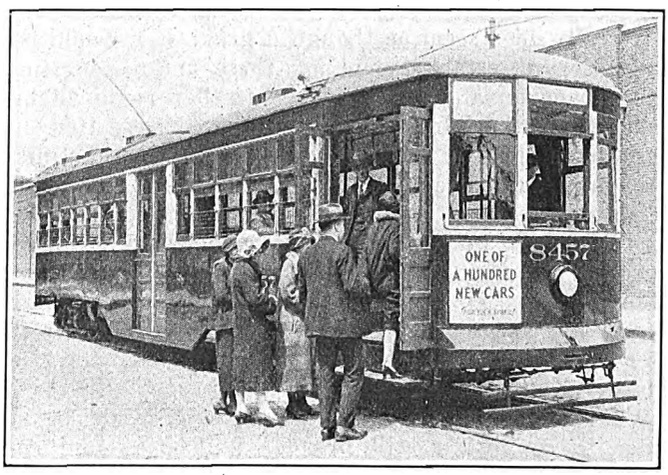
Advertising Increased Service in Philadelphia

IN ITS recent publicity material, the Philadelphia Rapid Transit Company has been emphasizing its efforts to meet the demands of its patrons for more and better service. It feels that its patrons prefer this course to a possibly slightly lower fare with poor service.

During April and May, the company's car leaflet "Service Talks" contains the following statement in every issue: "P.R.T. is constantly striving by every means at its command to make its service more adequately meet your needs. When we fall short, we appreciate receiving from you information specific enough to enable us to correct the fault. Address your suggestions to: Service Talks, 1520 Spruce Street."

Company car cards emphasized that patrons were getting more service, as by reading "More Service on This Route," or "This New Car Which Helps Improve Your Service Is Possible Because of the Present Fare."

When the company bought 100 new cars recently from the J. G. Brill Company, each car carried a dash card,



Philadelphia Advertises Additional Service by Dash Signs

"One of a Hundred New Cars for Your Service." The accompanying illustration shows its appearance.

These new cars are the P.R.T. standard one-man two-man cars, with front entrance and center exit. They differ from the previous Philadelphia standard only in the fact that the width of the front door has been increased 3 in., making it 5 ft. 1 in. in the new cars.

Honeycomb Ventilators on Third Avenue Cars

In the article describing the new cars of the Third Avenue Railway, published in the June 6 issue of ELECTRIC RAILWAY JOURNAL, a misstatement was made as to the type of ventilators used. These are Railway Utility Company's "Honeycomb" type with lighting fixtures.

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The Readers' Forum

Comments on Interurban Consolidation

AMERICAN ELECTRIC RAILWAY ASSOCIATION
NEW YORK, June 10, 1925.

To the Editor:

I have been much impressed with the receipt of the suggestion made at the Central Electric Railway Association meeting for consolidation of the facilities of the interurbans. Co-operative effort on the part of the carriers cannot help but be of great benefit in this respect, as in all other branches of the transportation utility service.

L. S. STORRS,
Managing Director American Electric Railway Association.

HENRY L. DOHERTY & COMPANY
NEW YORK, June 9, 1925.

To the Editor:

The suggestion made by John A. Beeler before the Central Electric Railway Association at French Lick that the interurbans in the central territory should be consolidated is certainly a good one. As a group of individual, comparatively small properties, their situation is difficult. The short-haul travel has in most cases nearly vanished. Long-haul business in which several properties participate has been developed only in small degree, largely because of the difficulties, as found in any line of business, of having so many parties to the agreements necessary with respect to service, operating practices, equipment and the apportionment of revenue and expense.

It really does seem as though a great step would be made toward establishment of these interconnecting interurbans on a profitable basis if they could all be brought together under some plan of consolidation or lease by a holding company and operated as a unit. Shippers would surely be attracted to do business with an electric railroad system of such extent, where it is hard to interest them with the present difficulties of such frequent interchange and the multi-division of responsibility among six or seven properties. I would like to see this consolidation made effective, as I believe it offers the most promising possibility of restoring the interurbans to a sound position.

While we are discussing this subject it might be in order to suggest a still broader unification and co-ordination of transportation facilities. Why not gather into one huge system all the bus and truck operations in Indiana and Ohio, together with the interurbans, utilizing each where it is most effective and in a way to contribute to the prosperity of the others? This is extending the principle that the city railway should provide all the public transportation in the city to apply to the state as well. The opportunity for doing so on such a large scale is more or less peculiar to these two states. But I believe it is worth thinking about here.

FRANK R. COATES,
President Central Electric Railway Association.

INDIANAPOLIS, IND., June 8, 1925.

To the Editor:

You ask my views concerning the consolidation of central interurban railways as suggested by Mr. Beeler at the Central Electric Railway Association meeting. I did not understand him to present a "plan," but only general suggestions as to advantages of such consolidation. Such consolidation would have to receive the approval of the public service commission of each state interested and also the approval of the interstate commerce commission. I consider any views I might give of no value, for they could be valuable only if based upon something that has been carefully considered and carefully worked out.

Many of the things mentioned by Mr. Beeler as desirable have already been accomplished and others are being accomplished by the association through its transportation and traffic departments. It may well be doubted whether a consolidation would be desirable if attained. Many may think more would be lost by disturbing the present friendly public relation than would be gained by a consolidation. Whatever might finally be the result of an effort for such consolidation, there certainly is nothing concrete before us now, and my judgment is that the present is not an opportune time for a discussion of the suggestion.

CHARLES L. HENRY,
President Indianapolis & Cincinnati Traction Company.

ANDERSON, IND., June 8, 1925.

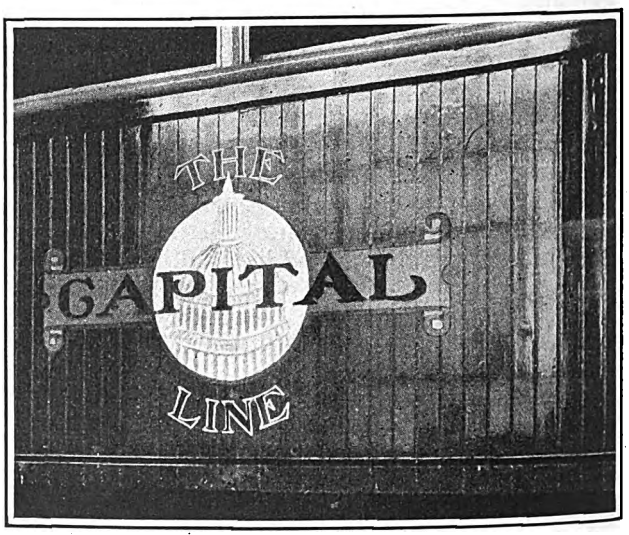
To the Editor:

Answering your wire of the sixth, Mr. Beeler's paper is a valuable contribution to the discussion of the pressing problems which face the interurban industry. The suggestions are constructive, but require careful analysis and investigation and must assume a more concrete form before a correct opinion can be formed as to their practicability and the comparative advantages and disadvantages of the solution proposed.

ARTHUR W. BRADY,
President Indianapolis & Cincinnati Traction Company.

W., B. & A. Becomes "The Capital Line"

THINKING that it would have an advantageous advertising effect, the Washington, Baltimore & Annapolis Electric Railroad has decided to change the color of its cars from Pullman green to traction orange. At the same time a device representing the dome of



This Device Is Being Painted in Colors on the Sides of the Cars of the W., B. & A. Electric Railroad

the United States Capitol at Washington and carrying the words "The Capital Line" is being painted in the center of the side sheathing of the cars. The particular significance of this name lies in the fact that the railway connects Washington, the capital of the United States, with Annapolis, the capital of Maryland.

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Association News & Discussions

Interurban Consolidation and Car Design Topics at C. E. R. A. Summer Meeting

Methods of Building Business and Development of Automatic Substations Also Considered at Three Well-Attended Sessions—Progress Made by Pittsburgh Railways Described—Lively Discussions Indicate Trend of Thought

MORE than 300 members and guests of the Central Electric Railway Association attended the summer meeting at French Lick Springs, Ind., on June 2-4. Despite two inviting golf courses and unusually warm weather, business meetings were characterized by fine attendance and carefully prepared papers and discussion of a wide range of subjects particularly important to the roads in the central territory at this time.

As expressed by President Frank R. Coates, the association was signally honored in having for its first speaker Lucius S. Storrs, managing director American Electric Railway Association. An abstract of Mr. Storrs' address appears on a following page of this issue.

Several other deeply significant papers followed. Under the title "A Major Operation on the Interurban," John A. Beeler, consulting engineer, New York City, advocated consolidation of the various connecting railways in the central territory for the purpose of effecting operating economies and building a more efficient electric transportation system to attract long-haul passenger and freight business. F. L. Blanchard, director of public relations Henry L. Doherty & Company, advocated a more general and more intensive use of advertising in all forms for building up a greater volume of electric railway business.

One entire session was devoted to the subject of power and its distribution. G. H. Kelsay, superintendent power and equipment, Cleveland Southwestern Railway & Light Company, outlined the trend of practice with reference to railway power systems. C. H. Jones, electrical engineer Chicago, North Shore & Milwaukee Railroad and Chicago Rapid Transit Company, spoke on automatic substation performance. L. D. Bale, superintendent of substations Cleveland Railway, described the results obtained from several years' experience with automatic stations on a strictly city distribution system. This power session was further enlivened by discussions from Allan J. Smith, superintendent of power Columbus Railway Power & Light Company, and C. C. Argabrite, electrical engineer Interstate Public Service Company.

Other papers included one on style in car design by Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL; a paper on car construction problems by J. A. Greig, editor *Electric Traction* and read by C. L. Van Auken, and a description of the steps taken by the Pittsburgh Railways for winning the confidence of the public, by Thomas Fitzgerald, vice-president of that property. The paper on style in car design, and a written discussion prepared by G. L. Kippenberger, assistant general manager St. Louis Car Company, are abstracted on another page. This general topic was also discussed by Thomas Elliot, vice-president Cincinnati Car Company.

On the subject of railway power systems, Mr. Kelsay compared conditions which are encountered in taking power supply from large interconnected systems with the former simple transmission line having comparatively small total connected power. He called attention to the reasons for the greater strain which is thrown on protective devices, and showed why it is necessary for modern circuit breakers to be scientifically selected and carefully adjusted to open in proper sequence under sudden overloads, so as to avoid disturbing the entire interconnected distribution system when this is supplied by several plants.

LINE LOSSES REDUCED BY CLOSER SPACING OF SUBSTATIONS

In his talk on automatic substation performance, Mr. Jones presented some interesting experience data accumulated by the North Shore Line over a period of years, and showing the degree of reliability which has been reached in automatic apparatus design. Of the seventeen substations in service on the North Shore property, ten are automatic and seven are manually operated. The total connected substation capacity is 19,000 kw. The largest single units in use are 1,500-kw. machines. An original substation spacing of 13 miles has been cut down to 6½ miles by installing intermediate automatic stations. This process of placing converting units at closer intervals along the line is again being repeated so that an ultimate spacing of 3¼ miles between conversion units will be obtained. Experience obtained over a number of years with automatic equipment has, according to Mr. Jones, demonstrated the advisability of reducing substation spacing to reduce line losses. With the longer spacing these were about 25 per cent, while with the 6½-mile spacing they were reduced to between 10 and 12 per cent.

During a period of eight years a careful record of performance has been maintained. Eight automatic stations have operated a total of 217,000 station-hours. The total d.c. output of these stations was 60,500,000 kw.-hr. and there were 305,000 complete starting and stopping cycles. One station installed in 1917 with a 500-kw. unit has made 77,000 complete operating cycles. These records, Mr. Jones pointed out, indicate the reliability of the apparatus used in even the early stations. He said that later stations have been improved, however, and cited the experience with a recently installed station of 2,000-kw. units, where the output during a year had been 7,000,000 kw.-hr. with practically no failures.

Experience on the North Shore Line includes both 25 and 60-cycle apparatus. There was consequently a period of change-over, which increased the likelihood of failures, but despite this condition, the average failures were one per 1,000 operations during the period of change and development. At present failures are extremely rare after the stations are once properly installed and adjusted. Careful records of repairs and maintenance show this item to be very small.

Buildings originally installed for automatic stations were very simple and small in size. There has been some development in practice as experience has been gained. When high-tension apparatus was first installed outside, the buildings were in some cases made extremely small. The savings in construction cost did not warrant this practice, and larger buildings are now being used. Recent substation buildings have inside floor dimensions of 35 x 26 ft., with an inside ceiling height of 15 ft. This size building is now considered sufficient for units up to 2,000 kw. Mr. Jones said that dissipation of heat from the machinery is a real problem, so that building ventilation was of extreme importance. He called attention to the reports of the power generation and conversion committee of the American Electric Railway Engineering Association and pointed out that they give much valuable information on this subject, which may well be studied by any property contemplating the installation of automatic substations.

AUTOMATIC SUBSTATIONS FOR CITY SERVICE

Mr. Bale told of experience with automatic stations on a city system. He said that the Cleveland Railway went to automatic stations about five years ago and is using them both for supplying extensions of lines to outlying territory and for additional power requirements in congested sections of the business district.

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Two 1,500-kw. units were used in the first station installed. There now are eight automatic stations in service, having a rated capacity of 18,000 kw., and two additional stations of 3,000-kw. capacity each are now under construction. Machines of 1,500-kw. rating are standard, for the purpose of reducing the number of repair parts required for maintenance.

Although considerable redevelopment was necessary in some of the first stations due to the use of makeshift apparatus, subsequent experience has been satisfactory, and has shown that automatic apparatus can be used profitably in congested downtown business areas.

Buildings for the first three stations erected in Cleveland provided 45 cu.ft. for each kilowatt of installed capacity. In later stations, this building size has been reduced to 15½ cu.ft. per kilowatt. Buildings on some of the more recent installations have outside dimensions of 41 x 41 ft. Considerably more apparatus is required in a city station than in one for interurban service, thus affecting the size of building required to house it properly.

Mr. Bale discussed the relative advantages of shunt and compound windings for converters in city stations. He said that the Cleveland property had decided to retain compound-wound machines after a careful study, in order to effect the power savings from properly maintained trolley voltage. He pointed to the effect of synchronized traffic control on power requirements, due to the starting of many cars simultaneously at various points in the business district. In Cleveland, he explained, the increased power requirement for this simultaneous starting has increased the energy cost from $20,000 to $30,000 per year. Shunt-wound converters used under these conditions would have resulted in reduced voltage and would have increased this energy cost materially. Beside the actual cost of energy involved, he said that the retention of compound-wound rotaries had been further dictated by the need for maintaining trolley voltage which would permit rapid get-away and acceleration of many cars simultaneously in congested traffic in the business area. The savings in time resulting, he held, are even more important than the actual energy costs involved.

Remote Control in Cleveland

Another characteristic of Cleveland conditions, described by Mr. Bale, is the large proportion of feeder sections that are connected to two stations. Of all trolley sections, 86 per cent are connected in this way. Consequently, supervisory control of stations was considered desirable, so that a central load dispatcher could reroute or transfer load in the event of a distribution system failure. Under the arrangement installed, the dispatcher can shut down or start any station at will. He has a graphic record of the load on all automatic stations before him, and also knows the voltage conditions existing at various locations at all times. With the equipment provided, he can corelate the operation of the eight automatic stations during normal times and can make any shifts of load required during an emergency. Previous to the installation of the remote control system, the automatic stations did not show a favorable 24-hour over-all efficiency, due to the converters running too long in some of the automatic stations. Since the installation of the remote control, the previous over-all efficiency of 85 per cent from bus to bus on the automatic stations has been improved to 95½ per cent. Results accomplished with automatic stations, Mr. Bale said, have been so highly satisfactory that the remote control board has been laid out for all automatic operation ultimately. This will require approximately 30 automatic stations.

In discussing the financial advantages of automatic substations for city service, he said that there are many benefits obtained from such control which cannot be definitely evaluated in dollars and cents, but which are nevertheless very important. Among these he listed increased efficiency, higher continuity insurance, due to the elimination of the personal element of the operator, and reduced electrolysis.

Comparative maintenance costs of automatic and manual stations were presented on the basis of total cost per converter unit. Mr. Bale pointed out that this method of comparison was not entirely fair to the automatic station due to the larger number of parts that are installed per converter as compared with a manual station. The figures, however, were as given below, averaged over a period of one year:

AVERAGE MONTHLY COST OF CLEVELAND SUBSTATIONS

	Manual	Automatic
Number of stations	5	8
Total rated capacity, kw.	33,000	18,000
Equipment maintenance, labor, material and superintendence	$146	$196
Buildings	219	270*
Operation, superintendence, inspection, etc.	362	184

*Includes maintenance of lawns, etc., used for decoration of automatic station grounds.

Of the eight automatic stations, five are almost new, which, he said, makes it likely that the maintenance account will be lower during the following year than during the period over which these figures were compiled. Mr. Bale added that one load dispatcher and helper are expected to be able to handle the entire remote control system when all stations have been changed over to automatic operation.

A. J. Smith agreed with the two previous speakers as to the reliability of automatic apparatus. He said that elimination of the personal element in switching was one of the most important advantages of automatic operation. In addition, he said that automatic switching apparatus handles emergencies faster and more reliably than can be expected from human operators. He maintained, however, that a higher grade of inspection personnel is required for automatic stations than usually is available for the maintenance of manual stations.

The relative energy economy of automatic and manual stations was compared by Mr. Argabrite, on the basis of a one-week test made on the lines of the Interstate Public Service Company. In this case, non-automatic operation of a station, running 24 hours per day, showed an energy consumption of 13,600 kw.-hr. at the a.c. side, while with full automatic operation of the same station, under traffic conditions that varied only by three cars for the week from the conditions under which the previous test had been run, the energy was reduced to only 11,050 kw.-hr. In a six months' test the efficiencies of his automatic substations from a.c. input to d.c. output ranged between 90.7 per cent and 92 per cent, while for corresponding manual stations the efficiencies were 81 to 84.8 per cent.

Combined Rail and Highway Car Proposed

During the meeting, W. J. Seitz of Detroit described briefly a patented system of combined rail and highway operation which contemplates the use of a light-weight trail car equipped with an eccentric axle which will enable it to be changed quickly from rail to highway, where the cars are to be pulled by light tractors, so as to permit plant delivery of products without rehandling.

President Coates read a copy of a letter written by Henry L. Doherty to the City Council of Toledo relative to the transportation situation in that city. In this letter Mr. Doherty sought to show some of the reasons for transportation difficulties in Toledo. This correspondence is published elsewhere in this paper.

Business Building Methods

The subject of building up through business was discussed by W. S. Rodger, general traffic manager Detroit United Lines. He held that the heavy diversion of both passengers and freight to automotive vehicles for hauls up to 50 or 60 miles calls for serious consideration by both electric and steam lines. He pointed to the increased operation of mixed freight and passenger trains by the latter as an evidence of the effort being made by the steam roads to give faster freight service and at the same time bolster up the earnings of some of their passenger trains. He also called attention to the increasing use of motor trucks by the steam roads for improving short haul service.

In spite of the diversion of traffic from rail lines, the speaker maintained that there is a constantly increasing demand for both passenger and freight transportation service. The agency which in the long run furnishes the best and most dependable service at comparable cost, he held, ultimately will get this business. Since the rail lines start with the cost factor in their favor, improved service is the key to getting the traffic. "Make the time faster than the other fellow and then tell the world about it" was his summary of the method required.

In the development of through traffic he explained the advantage obtained by the building of spur tracks into carload shipping industries, and advocated making every inducement to get tracks

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into such plants. He also advocated close attention to getting industries located exclusively on electric railways, and suggested that electric railways, wherever possible, be properly equipped to handle standard steam road cars, if only in switching movements. He said that this would enable the roads to gain considerable traffic and in most cases would eventually lead to an interchange with the connecting steam roads.

On the same subject, F. D. Norveil, general freight and passenger agent Union Traction Company of Indiana, agreed with Mr. Beeler that the short haul transportation of both passengers and freight have been lost, except under certain conditions, by both the steam and electric lines. He therefore advocated concentration of effort on securing long haul traffic which cannot be successfully handled by automotive vehicles. "Much of the distant travel in what is known as Central Electric Traffic Association territory," he said, "can be attracted to the interurban lines by proper equipment and proper schedules. He added that the great industrial territory which is linked up by the network of interurban lines in the Central Association furnishes a secure foundation for building traffic, if consolidated operation is brought about to an extent which will enable a substantial improvement in service to be offered the shipper. Wherever the existing service has been properly organized, he maintained that the interurbans have established an enviable record of performance over hauls of 250 to 400 miles, which has been 50 per cent faster and more efficient than even the old line express companies have been able to render over the steam roads.

Other Connecting Links Proposed

Mr. Norveil suggested other connecting links which should be built to the existing lines in the territory, in addition to those suggested by Mr. Beeler. He also made a plea for the fullest possible co-operation by the various operating departments in so improving service to shippers that interurbans would inevitably receive the amount of business to which their potential shipping capacity entitled them.

Greater co-ordination of facilities and equipment as they exist today was held to be the greatest immediate problem of the lines in the Central territory by T. H. Stoffel, railway department, Westinghouse Electric & Manufacturing Company. He said there is much evidence that shippers generally appreciate the service which electric lines are rendering, but added that there is still much opportunity for bettering and improving the service and effecting economies in operation. Under existing conditions, costs are increased and the amount of interline freight movement is limited by the lack of proper and adequate freight stations and terminals, the almost total absence of accessible team tracks and sidings for loading and unloading freight and the development of straight carload tonnage, failure to install sidings at industrial plants to develop new business and reduce the handling through warehouses, and the inadequate supply of rolling stock for even normal requirements.

Bringing Back Prosperity to the Electric Railway Lines*

Prosperity Must Be Won Back by the Railway Men—Interstate Bus Regulation Must Come—Consolidation of Properties a Possible Solution

By Lucius S. Storrs
Managing Director American Electric Railway Association

DURING the last few days it has been my very great pleasure to visit various parts of your Middle Western country. Progress is the general keynote of your section, and yet among you the general conditions in our own industry are below the standard of other businesses. There doubtless are among you executives of properties which are suffering, particularly at this time, a feeling of discouragement. Temporarily, perhaps, it is justified. There may be properties that never will recover from the severe blows they are now receiving. But that the industry as a whole, or any great part of it, is doomed in this great heart of the Middle West, where scores of other businesses are going on to success, is unbelievable.

I base this statement on the very essentiality of our business. The majority of the public now is, and has been ever since our industry came into being, dependent on electric railway companies for transportation. That this demand for such a public service will continue is patent. Methods of providing transportation may change in certain details, but the mass of the people must continue to be served by a public service. Their rides must be provided and their commodities hauled. The organization best fitted to perform this service will be called upon to render it. We must and will remain that organization. Since in the long run service cannot be rendered without a fair profit, that profit must, of necessity, come too.

How soon that happy day will come depends, in a measure, on the willingness of the public, as represented by federal, state and local government officials, and ourselves to get together in a genuine spirit of co-operation. But most of all it depends upon ourselves. For we shall progress no faster than we make our problems plain to the public and show a readiness to work with its servants in bringing about solutions. On this also you may depend. For the most part our prosperity will not just come back. It will have to be won back, and we are the ones who will have to win it back.

Electric railways are rapidly absorbing scattering bus lines and creating new bus routes. This service rendered by electric lines has grown 129 per cent in the last year. More than 3,000 buses now are being operated in conjunction with electric cars.

Despite the 25,000 common carrier buses operated and the 18,000,000 automobiles in the United States, federal census figures show car riding is growing. Although the business of many industries in 1924 was off from 10 to 12 per cent, electric railways during that year carried practically the same number of passengers that they did during the previous year.

Can any one familiar with these facts consistently say that there is anything but a great future ahead for our industry? It isn't a frail plant to be toppled over by a strong wind, or withered by a summer sun. Rather it is a sturdy oak with roots buried deeply into the business, home and social life of the United States. Here and there you may find a branch that has been broken, but the heart of the oak remains firm.

The future of local transportation depends on the co-operation of the government and managements. Because in governmental action at present lies the immediate relief which we need and to which we are entitled, I wish to deal briefly with that. First, however, I wish to emphasize that government relief through legislation will come only in proportion to the extent to which we make our needs clear to the people's representatives in government. We cannot get relief, nor indeed are we entitled to it, if we depend on governmental agencies to discover our legislative needs and provide them on their own initiative. Our duty in this respect is clear. We must get into the van now and make our legislative fights honorably, continuously and fearlessly.

Today we are confronted with a situation in regard to the interstate regulation of buses which demands our immediate attention. The Supreme Court recently held that the state public service commissions have no control over the operation of interstate bus lines. Previously, the Interstate Commerce Commission had declined, on the ground that it was without authority, to assume control of bus lines in interstate traffic. As a result, today interstate buses, as unregulated common carriers, are competing on every hand with steam and electric railway common carriers, which long have been under governmental control.

This situation embraces danger not only to steam and electric roads but also to established bus lines of higher character, of which there are many in this country. Bus manufacturers and operators themselves are demanding regulatory legislation. Obviously, the present situation will not be permitted to continue. Probably this question will be taken up as quickly as any at the next session of Congress. Corrective legislation is certain to be passed, because its need cannot be discounted by even the most radical legislator. To permit such a condition to continue would strike at the foundation of all authority now vested in national and state regulatory bodies.

Despite the justice of appeals which

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

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will be made for legislation, however, a great deal of educational work must be done. It is work which any transportation man can do with pride. Legislators will be eager to obtain unquestioned information regarding the facts. Hence it is the duty of every transportation man who believes in proper regulation, to his company and also to the public, to give generously of his time and effort in disseminating information on this question.

This is the immediate object before our industry, but a still greater obligation in relation to government activities rests upon us. That is obtaining general relief from our many onerous governmental burdens and interferences. In recent years there has been altogether too much legislation which imposes useless weights on transportation companies. As a result, our general transportation system in many cases has reached a state of exhaustion. It needs to have some of these loads lifted. Certainly no more should be added. It is plainly our duty to make every effort to demonstrate the unfairness of many of these burdens in the hope that legislation relieving us from them will be enacted.

All of us feel, of course, that we are carrying unjust tax burdens. And yet, I wonder if one of the reasons why we are borne down with them is that we have not made our situations clear. I have in mind particularly the paving taxes, which have been shackled on almost every city company in the United States since the inception of our industry. Latterly, about fifty companies have, through educating their legislators to the injustice of these taxes, freed themselves from them. Very few companies which have sought relief from this burden and made a clear demonstration of the fact that it was unjust have been denied relief. However, a very large number of companies which still are carrying the tax have either suffered in silence or made half-hearted or poorly organized efforts to bring about corrective legislation. Naturally, they are without relief.

Many similar levies were imposed on us in the old days when the assessment of public service corporation taxes was a favorite indoor sport, and there is no question but that we should be relieved of them. Our relief, however, will not come until we make intelligent and strenuous efforts toward getting it.

Whether it is the question of tax relief or some other form of legislation, we must approach our legislators openly, honorably and frequently, and see that our interests, which in the end are those of the great mass of people who use our services, are given fair treatment. They will not get it if we stay at home and wish for a change or send a few highly paid attorneys to represent us before legislative committees. Local legislative situations demand attention just as do those of the nation and states.

One of the gravest problems with which the industry has to cope is that of maintaining schedules in downtown streets. Where once this was a problem only in the larger cities, now, on account of lack of proper ordinances or inefficient enforcement, it has become an issue in almost every city and town in the United States. There is no doubt that both motor car owners and transportation companies have certain rights which should be granted by city officials, and, once granted, protected. No one will seriously contend that an electric car should not have the right-of-way over its tracks at all hours of the day and night. No other vehicle has any right in such circumstances to hold it up. Officials of every city should recognize this right and enforce it. Sooner or later this will be done throughout the United States, but, as in other cases where the co-operation of public servants is required, it will not be done unless we transportation men interest ourselves in seeing that it is done. It is our job to convince the car rider, the business man, the motorist and every one else that the interests of the community are best served by keeping traffic channels open. We can do it if we will put enough energy into the job.

The foregoing are only a few examples. In a measure the problems I have dealt with cannot be solved without the aid of persons who have no immediate monetary interest in our industry. Now, however, I want to turn to our own dooryard, or, indeed, the inside of our own house, and discuss particularly some duties that are incumbent upon us as a transportation family and on us alone.

Primarily, I want to urge the necessity of our rendering service in the broadest possible terms to the territories in which we operate. By that I mean rendering both passenger and freight service with the aid of electrically propelled cars, buses, trucks and whatever other means are necessary.

If we will fulfill all of the transportation requirements of our communities, none need have any qualms about our future success. If we render only a partial service and permit others to compel us to share the local transportation revenue with them, of course, we shall not fare well.

We have suffered much from competition throughout this country. Much of it has been unfair. You Middle Western operators, and particularly you men of Indiana, can appreciate the full significance of that statement. The wildcat bus and truck operators have preyed relentlessly on you for many years.

Here as elsewhere, however, in many instances, we have hesitated to broaden our service. There are many reasons for this. Many of them are sound from a business standpoint. Often, we have doubted if additional service was warranted. Again, some of us have hesitated to embrace new forms of transportation because we believed they would prove unnecessary or unprofitable. Competitors, sometimes encouraged by manufacturers, have not hesitated to enter the field.

Often they have been able to show a profit, and in almost every instance they have decreased our earnings. In this situation the question arises: What was and is the best thing to do? Shall we permit competition to enter in and take chances on its failing to make a profit, or shall we prevent competition by enlarging our own service and taking a gambling chance that the future will produce sufficient return to warrant our move? No broad, general rule for meeting such a situation can be laid down, but it is my conviction that in so far as possible we should so thoroughly cover our respective territories that competition at once will be discouraged.

In this connection, it may be interesting to review the code of principles regarding the respective places of the bus and the electric car in local transportation which recently were drafted by representatives of the automotive industry and the American Electric Railway Association and which were adopted by the executive committee last February.*

The representatives of the automotive industry on the committee which drafted these principles speak for the outstanding bus manufacturers of the country. They realize, I believe, that electric railway companies offer to them the greatest future dependable market for their product. Hence, they are subscribing to the constructive principles set forth. As time goes on, I believe that all bus manufacturers will recognize the soundness of these principles and govern themselves accordingly.

Consolidation of Middle Western Lines

Conditions on interurban properties, particularly, have changed greatly in recent years. They are bad in many places now, especially on properties which have depended largely on short-haul business. Those that have been able to take care of long-haul business have not been hit so hard.

The suggestion has been made that we should attack this problem by greater consolidation of effort, if not by actual consolidation of physical properties. Intelligent consolidated effort in any form means two things: First, lowered expense and, second, more business.

The first consideration in any consolidation agreement, of course, is whether it is physically possible. It would seem to be here. Many of your properties now connect. In fact, I understand that by the laying of a comparatively small number of miles of track you could link up the greatest interurban systems in Indiana, Illinois, Ohio and Kentucky and tap Missouri.

If an arrangement could be made whereby these properties, large and small, could be operated as one, there is no doubt that great operating economies could be effected. It also is needless for me to point out that under such a consolidated effort you would be working under distinct advantages in obtaining long-haul freight and passenger business. I understand that you have done well through your freight association in attracting a certain amount of long-haul business, but more can be done if the proper facilities are provided.

From a standpoint of financing, I believe, consolidation would prove of great value. You are suffering now, I understand, from a lack of cars with which to move freight. Of course, you

*See ELECTRIC RAILWAY JOURNAL, Feb. 21, 1925, page 288.

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cannot get freight to move unless you have facilities for moving it. It is a waste of time to solicit such business when your facilities are inadequate to render the best possible service.

The business is to be had. That goes without question. The tracks are available. But the responsible, consolidated organization for getting the business and the equipment for carrying it are not available. The answer to such a situation would seem plain.

Finally, let me urge the great need for every one of us in this industry to become greater salesmen for it. We have the human links of a very great chain, but it seems to me that those links in many cases have not been welded together as well as they might have been. If we will devote sufficient energy to it, every man in the electric railway business can be made a real salesman, not only for our immediate product but for the entire industry.

One thing more. Let the association help you. It is your hired man. It has facilities and information for aiding you and wants to place them at your disposal. It cannot possibly anticipate all of your needs. But if you will make them known all of us will try to supply them.

A Major Operation on the Interurbans*

Consolidation of the Existing Lines in the Middle West, with Possible Construction of Connecting Links, Should Make it Possible to Give a Much Improved Through Service at Lower Cost than with the Present Independent Systems

By John A. Beeler
Consulting Engineer, New York City

INTERURBAN railways, quite generally, are today in a difficult position. They are suffering from a continuing decrease in passenger riding. Unfortunately, the interurbans of this great central territory are no exception to this general condition. The reasons for the declining patronage are: The comparatively recent extensive inauguration of highway coach service, the constantly increasing use of private automobiles by the people who formerly made use of the electric railway facilities, and the general business depression especially noticeable throughout most of this section of the country.

The greatest loss in riding seems to apply to travel which involves a distance of 50 miles or less. To put the matter bluntly, we apparently must face the fact that the bulk of the short-haul transportation is lost to many of the interurban railways. The question is what is the best course for the interurbans to take. They have contributed so magnificently to the upbuilding of this central territory that surely they will not be permitted to fail and to be abandoned without first making every possible effort to determine whether there is not still a place in the general scheme of transportation where these existing facilities can be put to good use.

At present the interurban systems in the central territory are laid out primarily for comparatively short-haul traffic, both freight and passenger. They radiate out from the principal cities to communicate with the smaller surrounding cities and towns. When through business is undertaken, as it has been to a certain extent, it frequently involves joint operation over the lines of from three to six different companies. Thus, any matter pertaining to the operation of such service comes under the supervision of from three to six managements; it requires the attention of the operating, traffic, accounting, claims, and mechanical departments of from three to six organizations. When a claim is to be settled it involves a determination of which one, or several, of the three to six companies is responsible. This often results in an expenditure of time way beyond the value of the claim.

When a traffic man goes out to induce a shipper to send his materials the electric way the shipper may be disposed to give his business to this man, but he realizes that his product will be in the hands of this man's road only for a small portion of the journey and he wonders what treatment he will receive at the hands of the two to five other managements involved. He wonders where he should check up in case of delay in shipment or from what road he would receive settlement in case of damage or loss. He fears the complications and passing of responsibility which come from a multiplicity of small road managements. There is also the continuous difficulty of getting cars back to the owner road, as the per diem rate does not compensate the owner road to the same extent as the use of the car.

The foregoing leads up to two things:

First, that the opportunity, perhaps the only possibility, of continuing the interurban railways of the central territory on a successful basis lies in building up the long-haul service, both passenger and freight, between the principal centers.

Second, that this character of traffic can best be secured in a big way through either consolidation of these interconnected interurbans or at least by a pooling of facilities under a centralized management, which will in effect give the results of consolidation.

This may be an unpopular suggestion with some of the operating officials because it means the loss of jobs. But the time seems to be here when it is necessary to make a choice as between saving the job or saving the railway. To endeavor to save the job may result in the loss of both the railway and the job. As a parallel example, where would the great steam railroad systems such as the New York Central lines and the Pennsylvania lines be if they were operated as a series of small independent companies passing along their traffic from one to another.

Only in this central territory is the opportunity for consolidation and operation of all the interurban properties as one super system afforded. Here we already have the elements of what might readily be transformed into an electrified railroad system connecting such important terminals as Louisville, Indianapolis, Chicago, Cincinnati, Dayton, Toledo, Cleveland, Detroit, Jackson, Kalamazoo, Grand Rapids, Terre Haute, Columbus, Fort Wayne, etc.

By building a comparatively short connection between Crawfordsville, Ind., and Danville, Ill., this proposed system could be made to include the Illinois Traction System, extending westward to St. Louis. Similarly a line built from Elkhart, Ind., to Kalamazoo, Mich., would greatly increase the usefulness of the lines in Michigan for through business between Chicago and Michigan points and between Michigan points and towns in central Illinois and St. Louis.

To operate all these lines as a single system would accomplish two very important results, both having considerable influence toward making these properties pay. The first is that the economies which would be introduced are so obvious as hardly to require detailing. The management and overhead expense would be greatly reduced as there would be but one billing, one accounting department record, one claims record, one definite responsibility for damage or loss, one responsibility for planning facilities, one operating department, and so on. The second great advantage would be that the consolidated system would be able to offer its prospective customers the facilities of one great electrified railway system as against service over pieces of lines owned by the different companies, there now being 70 in this district.

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

COMING MEETINGS
OF
Electric Railway and Allied Associations

June 16-19—Society of Automotive Engineers, White Sulphur Springs, West Virginia.

June 22-26—American Institute of Electrical Engineers, Saratoga Springs, N. Y.

June 26-27—New York Electric Railway Association, Hotel Champlain, Bluff Point, N. Y.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

August 12—Summer Outing at Pelham Bay Park, Metropolitan Section A.E.R.A.

August 13-14—Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

Sept. 10—Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.

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Under such a unification plan it would be possible to utilize the equipment of the unified property to better advantage. A greater flexibility should result with less idle time and less non-revenue mileage. There would also be the possibility of sleeper trains and other through passenger service that are not now practicable in view of the difficulties involved in getting numerous managements to subscribe to the required standards of equipment and service.

By a general introduction of light-weight modernized equipment of attractive design, it is possible not only to popularize the service but materially to reduce operating costs. With the bulk of the present heavy equipment retired an excellent opportunity is presented to standardize on cars. This means a great reduction in material and stores, shop expenses, maintenance, and power, and fewer cars to render the service.

As a concrete example of what might be accomplished by consolidation and the use of light-weight equipment, let us consider the State of Indiana. Here there are twenty companies operating nearly 1,800 miles of interurban electric lines. This is 10 per cent of the total interurban mileage of the United States, yet this state has but 1.2 per cent of the area and 2.7 per cent of the population of the country. At the present time operations of these lines are approximately as follows:

Total revenue	$16,000,000
Operating deductions	13,000,000
Gross income	$3,000,000
Fixed charges	4,000,000
Deficit	$1,000,000

Were all the roads in Indiana operated as one unit, as outlined herein, with light-weight interurban cars, employing the one-man principle wherever practicable, I estimate that a net saving of $2,000,000 would result after paying interest on the new equipment required. This would give a surplus of $1,000,000 instead of a deficit of $1,000,000, which should be used to provide a more reasonable allowance to cover renewals and retirements and improve the service generally. The interurbans in Indiana are fairly characteristic of those in the district and represent about one-third of the mileage and traffic in the district.

Generally speaking, the interurbans, especially those operating on a private right-of-way, should render through, fast, limited stop service. Co-ordinated with them, to care for the local service and cover the territory not otherwise served, a comprehensive system of coach and bus transportation under responsible, and preferably centralized, control should be maintained. Already in the State of Indiana alone 206 independent companies are now operating 760 coaches over 3,400 miles of route. Thus, the importance of co-ordination is seen if duplication of service is to be minimized and the public transportation requirements economically rendered.

These suggestions are made not without appreciation of the fact that there would be many problems to be worked out to accomplish the desired end. If the traffic developed takes on considerable proportions, it might be necessary to get new rights-of-way in or around some of the cities. But with so large a system, and with the greater standardization and increased responsibility which it would have, there doubtless would be possibilities of working out better arrangements for terminal entrances and steam railroad interchange which are not now available to the individual electric lines.

"Transportation is civilization," says one prominent New York editor. Any form of transit that is not progressing is gone just as surely as old Dobbin and the hitching post. Perhaps this is an idle dream, but the trend of business and future outlook under the present operations demand prompt and heroic treatment. In my opinion, the present managements will do well to give serious consideration to any workable plan, either by actual consolidation or at least of unified operation of an extensive part of the electric lines which now are comprised in the Central Electric Railway Association territory. Right now is the outstanding opportunity to transform these properties into a prosperous electrified major railroad system of no mean proportions.

Style in Car Design*

The Appearance of a Vehicle Has a Decided Influence in Determining Its Ride-Getting Power—The Author Shows How the Automotive Vehicle Has Had a Distinct Appeal of This Sort, and That Similar Principles Can Be Used in Electric Railway Cars

BY CHARLES GORDON
Western Editor ELECTRIC RAILWAY JOURNAL

EVER since the automobile first began to make serious inroads on the business of local and interurban transportation the words comfort and appearance have been used frequently in discussions of electric railway equipment. Interest in this subject has grown steadily as the effect of the increased use of automobiles has been felt. During the last four or five years the bus has been improved rapidly and has taken its place as an important local transportation agency for certain conditions. As the application of automotive ideas has brought about marked improvements in the appearance, comfort and merchandising appeal of buses, railway car operators and builders alike have manifested an increasing tendency to be critical of past precedents and methods, and to feel that electric railway cars can be further improved so as to attract additional riders from those who at the present time are stretching their incomes to use automobiles for many unwarranted purposes. Consequently most recent discussions of ride merchandising include consideration of the elusive subject of building cars that will create a desire to ride.

Real progress comes when one sees beyond the restrictions of precedent. Let us examine for a moment some of the influences which have affected present-day vehicle design, with the object of discovering their origin, and of directing our attention into channels that will lead to new lines of thought. Both street cars and automobiles date back to the carriage or coach. When electricity was applied to street cars, power was no longer a limiting factor and their size grew steadily. Finally the double-truck car was introduced, and steam road practices began to creep in. Structural steel shapes and heavy forgings were widely used. Trucks and brake rigging also showed the same influence. As a result weights mounted rapidly until finally realization of the vicious circle produced by heavy cars, which in turn required heavier rail and more rigid roadbeds, resulted in a widespread demand for weight reduction. When the pendulum of opinion finally swung to the lightweight extreme, parts were cut in strength, as well as in weight, to a point which resulted in some reaction. However, the increased use of higher grade materials again makes possible still further weight reduction. But throughout this development the appearance of the vehicle has been a secondary consideration.

AUTOMOBILE DESIGNED FOR APPEARANCE

The automobile since the start has remained a vehicle for individual or private transportation. For this reason, the element of appearance or style has been a very live factor ever since the early milestones of mechanical development were passed. Being primarily a pleasure vehicle, the element of sport has exerted a strong influence on body appearance. During the formative days, body designers — not engineers, but rather those interested in the sales value of the design—sought for effects which would typify rakishness and speed. The long streamlines of fast water craft furnished the desired *motif*, and soon the marine element made a distinct mark on automobile architecture. The engine was put out in front of the dash, the body was dropped lower, side doors were installed, hood lines were raised, sharp angles eliminated, and soon the streamlines of the modern automobile were evanted. Due to its direct automotive relationship, and the influence of automotive personnel, the bus is making rapid progress in the same direction.

The general effect produced by this attention to body lines and details of automotive vehicles has proved of direct merchandising value; in the one case on the sale of the vehicles and in the case of buses on the sale of rides in them. If there is any question of this value in your mind try to explain why you turn in a perfectly good and serviceable 1922 or 1923 model automobile to get a 1925 model, or why

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

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passengers will flock to the longest, leanest and sportiest looking bus you can put on the road. For want of a better term, I have called this elusive merchandising appeal the appeal of "style."

"What is it," transportation men ask, "that makes people ride in buses?" Increased comfort doesn't explain it. Surely they are not safer than electric cars! Why will a passenger ride 50 miles in a low-hung bus that winds its way over a heavily traveled road or over congested and slippery pavements when a parallel interurban gets him to his destination just as fast or faster over a private right-of-way and at a lower fare?

"The rubber urge"; "comfortable seats"; "novelty"; "reduced noise"; "flexibility at terminals"—yes, part or all of these have some influence, but there is another very important factor. That is the appeal of "style." Once this factor in the sale of transportation is definitely recognized, an explanation for some of the inconsistent preferences exhibited by the purchasers of transportation is found, and as all good merchants should do, we may proceed intelligently about the business of satisfying the demand. That is one safe rule for building patronage in any business.

In one location which happens to occur to me as an illustration of a point I am making, a high-grade interurban line was paralleled by a bus competitor. The railway also put on buses, and soon an active fight for business developed. In the course of this struggle, three different types of buses were put on in rapid succession, each more rakish looking than its predecessor. During this time the interurban continued rendering service, which made the run in a shorter time and at a lower fare. As each new bus appeared, however, the passengers flocked to the most stylish and rakish looking model. Call that appeal what you will, I am referring to it as the appeal of style.

From this standpoint, then, the problem of car design consists of producing a visual invitation and creating an instinctive desire to ride. In general this might be expressed in a slightly different way by saying that the problem of building business on electric cars consists, to a large degree at least, of making it stylish to ride them.

Street cars must continue to haul the masses during the rush hours, and they must be designed and built with that end in view. But even the workman and mechanic are by no means beyond the influence of style. Large numbers of them have taken to the automobile for getting to and from their work. Not only does the railway lose the owner of the machine, but it also usually loses three or four additional passengers, who ride home with their more fortunate companion. And my point is that style is a potent factor in this use of the automobile by workmen.

I believe that serious consideration of this appeal to style, and the natural human satisfaction that comes from stepping into or out of a smart equipage, may be so capitalized in car design as to constitute a material aid in winning back former patronage and building new business. Street cars have, in a sense, been "over-engineered." By this I do not mean that there has been too much effort and time spent on the scientific employment of materials, or in the development of construction methods, but rather that utility and durability have been too much considered to the exclusion of appearance and merchandising appeal. The automobile industry has developed a brand of body designers who are primarily artists. They draw beautiful pictures of bodies that they think will appeal to the public, and it is then up to the engineers to find out how to build them. This usually is far from an easy task. Compromises must be made due to considerations of cost, durability and maintenance. These latter factors are of vital importance in the case of cars, but at the same time appearance must be made one of the primary considerations and not secondary, as has too frequently been the case in the past.

There seems to be no inherent reason why an electric car, operating on rails, cannot be given a rakish, stylish appearance. The structural problems involved seem fundamentally simpler than those encountered in an automotive vehicle, carrying its own power plant and designed to operate on the highway. But the desired results will be accomplished only by a courageous departure from existing precedent.

Grand Rapids Competition Attracts Attention

We have made considerable progress in this direction within recent years. During the past few months the Grand Rapids Railway, through the action of its vice-president and general manager, Mr. DeLamarter, has attracted the attention and interest of the entire industry by endeavoring to stimulate car design development through a form of competition between three car builders, who were given only general instructions as to the type of car desired, and were allowed more or less a free hand in developing sample cars which they considered best adapted to meet the requirement of building street car business. These cars, which have just been delivered, have been described in detail in recently published articles (see ELECTRIC RAILWAY JOURNAL, May 9, page 721; May 16, page 767, and May 23, page 807). They are now undergoing a series of tests, which will include an attempt to determine the preferences of the riding public of Grand Rapids. They include a number of interesting departures from previous practice, particularly along the lines of merchandising appeal, improved riding qualities and noise reduction.

There is a marked effort in all three cars to accentuate streamline effects. On one car a change from customary painting practice helps to carry out the effect sought. Instead of finishing the doors in varnish, or in one color of paint, the body colors both above and below the belt rail are carried across the doors and are split at the belt rail line so as to accentuate the effects produced by solid bands of color extending the entire length of the car. Still another interesting innovation consists of a skirt, similar to that sometimes used on buses, to conceal part of the trucks and apparatus under the car.

There is one phase of this experiment which deserves more than passing attention, and which has considerable significance in connection with the electric railway car-building business. This business is distinctive in that it is not a manufacturing business in which the product is developed, manufactured and sold. It is more in the nature of a contracting business in which the builder bids on specifications and in some cases more or less complete plans furnished by or developed for the customer in accordance with his ideas. This is particularly true of the larger properties in position to buy cars in comparatively large groups. The high cost of special development for a small order usually forces the small road to accept one of several designs developed for large systems, which the car builder offers with such minor modifications as will fit the requirements of the individual property interested.

This practice usually results in each large order being a complete development job to fit individual requirements. There is much less continuity of development than would be the case could several types of equipment be designed to fit certain general conditions and then manufactured in quantities and sold outright. In the manufacture of buses there is a distinct tendency in this latter direction, and the resulting progress that has been made in design indicates that under these conditions competition is allowed to have its fullest effect in stimulating development.

The Grand Rapids experiment is to some extent a step in this direction. It is apparent that each of the car builders involved, if convinced that a market existed for such cars on a considerable number of properties, would take advantage of the opportunity to develop its product gradually so as to include the best of available ideas.

The committee on unification of car design, at its last meeting in Chicago, considered this subject, and discussed ways and means in which this movement might be encouraged. At that meeting it was decided to investigate the possibility of collecting clearance data from the various roads of the country, with the object of determining the limiting dimensions that fixed the sizes of cars on various properties. It was the opinion of the committee that the savings which would result in the cost of equipment would justify considerable study of the possibilities in this direction.

The Car Builder's Car*

BY GEORGE L. KIPPENBERGER
Assistant General Manager
St. Louis Car Company

IN HIS paper on "Style in Car Design," Mr. Gordon has pointed to facts which may be deemed fanciful by some of us, but which are nevertheless timely and fitting for thoughtful consideration.

Mr. DeLamarter, in planning his experiment, in no sense lost sight of the

*Abstract of written discussion before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

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fact that the sturdy, conventional, present-day electric car on rails is the only effective medium for taking care of peak-hour, mass transportation. Other types of vehicles, including buses, cannot. This need not preclude the possible need of a de luxe type of "electric rail coach."

Regardless of opinion, the paper under discussion indicates that this question is a live topic for consideration at this particular time. The present-day riding public—product of this advanced age—is, we may say, fastidious. A natural incentive, therefore, inclines the owners of rapid transit, a most vital need of the age, highly to improve and embellish their various vehicles of transportation, in a strained effort to keep pace with the discriminating sense and tastes of the times. It would seem logical, therefore, for some far-seeing individual to conceive of and initiate into use a new type of vehicle, electrically propelled on rails, extreme in design, and differing radically, in form and structure, from that now in common use, and at the same time conforming in "style" and fashioned in pattern to the cravings of this "de luxe" age.

This incentive, if followed, would lead to the perfection of an "electric rail coach" of such body lines, appointments and ease of carriage that prospective patrons will instinctively become attracted to its use as a matter of choice and preference.

The three sample cars recently designed for the Grand Rapids Railway, by as many different car builders, are not extremely radical in the full sense of the word. In the sense that they are fully equipped with the very latest improved devices, are as easy riding and silent running as the art will permit, have faint suggestions of a few automotive ideas, and are pleasingly and highly decorated, they typify an approach leading to the ideal in the mind of the manager of that railway.

The topic under discussion leads to the thought: Will a radically changed type of car, of a "style" conforming to the dominating tastes of the present-day riding public, pay its way? Will first cost, maintenance, and limited carrying capacity overbalance earning power?

The advocates of a radically changed car contend that the appeal of the embellished vehicle will attract fares new and old, now lost to competing vehicles. In other words, it is contended that the people will patronize a vehicle which caters to their taste, and are willing to pay to be satisfied.

The automotive industry expends millions annually in engineering research and plans for betterments to satisfy public demands. One concern alone expended $5,000,000 on the single item of developing a more perfect radiating system. The allied electric railway industries expend annually a good sum of money upon development and in the way of improving devices and accessories. Research engineering work of this nature, however, is generally scattered and done in a diversified way, without any concentrated effort to perfect a particular item or solve a difficult problem. The expenditures in money, time and effort made by our industry to accomplish these ends admittedly are in no way comparable and commensurate with like expenditures made for the same purpose by the automotive industry.

If there is a place for the radically changed street car or "electric rail coach" today, why has not the car building industry initiated its use by offering it to the trade? Permit me to illustrate my impression in answer to that query by relating an incident:

Upon delivery of the three different sample cars to the Grand Rapids Railway, the general manager invited quite a number of railway men from far and near to witness the first test trial runs. One of the group making the inspection said: "This is the first time the *car builders* have built a car for the car rider." His statement was immediately corrected to, "This is the first time the car builder *has had an opportunity* to build a car for the car rider." Mr. DeLamarter's innovation gave the car builders an opportunity more or less free to build a car to attract and please the public.

Mr. Gordon, in his paper, has pointed to one of the reasons why the design of the street car has not developed and advanced, and seemingly has not kept equal pace with competing vehicles, along the lines we are discussing. The car building plant is a contract shop. We contract to build on specifications—the master mechanic's specifications—and the result is a master mechanic's car, well built, if you please, from a maintenance standpoint and efficient for handling passengers. From this discussion, however, we sense that in this day and age passengers want something more than being safely handled.

Were it possible for the car builder to merchandise his car—his *standard* car—if we dare mention the word standard in connection with cars before railway men—the builder would have opportunity and incentive constantly to improve and develop style and design. Likewise he would then have the required incentive which that opportunity afforded of improving facilities needed to reduce costs of the various fabricating operations involved in his design. The design being his standard for common merchandising, he could fabricate most of the parts for stock, in quantity production, at reduced costs. Building his standard car under his own specifications, he would be free to put quality into his work and place the stamp of individuality on his product, even though he built several models.

On the other hand, the railway manager, usually not the railway owner, although recognizing the public trend, has a sense of responsibility to stockholding interests and may not be sufficiently brave or free to experiment and depart from the common practice of equipping his line with cars built to withstand rough usage and designed primarily for durability.

In common practice the car builder is expected to build a car that will endure four or five times longer than a bus or automotive vehicle which meets the demand for stylish appearance. As the public is the final arbiter, we may expect the public reaction to the Grand Rapids experiment to have a far-reaching effect. Favorable reception of the sample cars submitted may be expected to stimulate effort in the designing of cars along the same general lines that will combine durable qualities with artistic effects.

Executive Committee C.E.R.A.

W. S. RODGER, general traffic manager Detroit United Railways, presented a report of a special committee of the Central Electric Railway Traffic Association, recommending by a majority vote of the committee the apportionment of loss and damage claims on a mileage basis between interested roads, instead of on a revenue basis. After some discussion, the executive committee voted to adopt this recommendation, even though some members favored the revenue basis of distribution.

On the invitation of President Coates, Lucius S. Storrs, managing director American Electric Railway Association, addressed the committee briefly, and offered the Central Association the cooperation of headquarters and of the American Association.

It was decided to hold the annual meeting on Jan. 28 and 29 at French Lick. This date is fixed by the constitution, and as the French Lick Springs Hotel had offered the same schedule of special rates as were extended for the summer meeting, it was decided that this would be the best location.

Executive Committee C.E.R.A.

Weight Equipment*

By Howard Gass
St. Louis Car Company

TO THE minds of mechanical men improvement means that combination which will result in low maintenance costs and reduction of equipment failures. To the transportation man, improvement means low operating cost, faster passenger interchange, faster acceleration and deceleration and consequently higher schedule speeds. To the purchasing agent it means lower first cost and reduced investment.

In times past most equipment was built in accordance with the ideas of the master mechanics and operating officials. Prime consideration was given to operating and maintenance costs, with some slight idea of appearance, but without any specific consideration of the rider's views and taste in the matter. Cars were built according to the operating requirements, but without much regard for the views of passengers. Long-established precedent was an important factor in fixing the type of equipment specified.

Changes designed to improve riding and comfort were judged primarily from the standpoint of maintenance cost and were usually rejected in favor of older and more familiar forms of construction.

The introduction and development of the bus to meet the desires and fancy of the public have led to a rapidly changing point of view. Our indifference to

*Abstract of paper read before annual meeting Mid-West Electric Railway Association, Kansas City, Mo., May 25-26, 1925.

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the public's preferences in the matter of equipment has been brought about by our proximity to the problems of operation and maintenance and the inability to view the business of transportation with sufficient perspective. To accomplish this it will be necessary for each department to compromise in favor of pleasing the car rider. Lowest possible maintenance cost dictates substantial construction, heavy cars, large power and brake units—all tending against high schedule speeds. Operating economy requires light weight and high schedule speed. The public demands both comfort and speed. Present-day improvements may be expected to be along the lines of slight additional increases in weight, higher schedule speeds, and concentrated attention to passenger comfort.

Today we have single-truck cars seating 30 people, making a schedule speed of 10 to 12 m.p.h., and weighing 16,000 lb. Double-truck cars are being built to seat 44 passengers, which make schedule speeds of 10 to 12 m.p.h. and weigh 25,000 to 30,000 lb. Lightweight suburban cars seat from 45 to 50 passengers, make 20 to 22 m.p.h. schedule speed and weigh 30,000 to 36,000 lb. Cars of the same capacity and designed for speeds of 30 to 35 m.p.h. weigh from 36,000 to 40,000 lb. This equipment shows a marked reduction in weight in comparison with cars for similar service built ten years ago.

Many features now being added to cars to increase safety, comfort convenience and speed of handling passengers tend to increase the weight of cars. Pneumatic operation of many auxiliaries causes a considerable increase in the weight of air equipment over that required for brakes alone.

Weight reductions have been cumulative. Reduced body weight has allowed the use of smaller motors and this in turn has permitted material reductions in truck weights. Use of higher grade materials has also aided in this process. Further progress in this direction is the probable method which will be used for any further weight reduction.

During recent developments increased attention has been directed to the use of aluminum and its alloys. This material not only reduces weight, but it also has a pleasing appearance as a finish. It does not ring like steel and consequently its use will tend to reduce noise. In the design of car and truck structures, however, deflection is of importance as well as strength, and this factor must be considered. Combination materials like plywood with steel faces are also being produced for car construction, but problems are presented to the builder in the application of such materials.

Wood still offers the car builder many advantages over other materials for body construction. A $\frac{1}{16}$-in. steel plate applied to the side of a car with rivets will show dents at the rivets and buckles between the stiffening members. A $\frac{5}{8}$-in. wood sheathing will weigh no more than the $\frac{1}{16}$-in. steel sheet, will have no buckles and will give the same strength. Similar comparisons may be carried through other members of the car framing.

In the sample car recently built by the St. Louis Car Company for Grand Rapids the underframe is of steel, the sides are composed of steel sheets, and the floor, posts, roof, sash and doors are all of wood. Except at the bolster, a very light wood post is sufficient to stiffen the side girder, and the bolsters can be stiffened by light drawn-steel sections. Instead of being supported by steel carlines, which must necessarily carry wood furring for the attachment of the wood, the roof is supported on wood carlines only with an upper and lower member tied at suitable points with spacing blocks. This construction is in some respects similar to that in an airplane wing. Furring strips are of selected hard wood.

The wood posts have sufficient section to permit running bolts through them without destroying their usefulness as girder stiffeners. They are cut down at the window sill so as to give the maximum glass space for vision. The upper portion is increased in size to provide a secure fastening for the letter panel and the roof carlines. The light wood top plate forms a spacer for the posts, a stiffener for the letterboard and a firm connection for the roof. The latter is of the arch type and will carry its own weight, the only requirement being that the posts shall have sufficient stiffness to resist the tendency of the arch to flatten.

The ends of the car, which are subject to collision shocks, have a steel facing over an oak crown. In this we are following the practice of the ship builder, who backs his heavy armor with an oak frame to absorb and distribute shell impact on the hard steel face. For the interior, woods of beautiful grain are selected.

For the trucks, to reduce vibration, steel rims and steel hubs with wood filling plates are used. The hub and rim have suitable copper connections for the transmission of the ground circuit to the rail. Brake noises are reduced by the use of fabric-lined clasp brakes, using material with high coefficient of friction and heat resistance. Motors were specially selected to deliver their maximum power at the same speed, so that there should be no whirr or humming noises set up while in operation.

Seats are covered with imitation leather and have deep spring cushions and backs, so that the rider has all the comfort he could expect in a moderate priced automobile. In spite of the many innovations and high-grade materials used on this car, the purchaser is receiving a unit at a cost very slightly if any in excess of that which he has been accustomed to pay, but which will effect marked economies in the cost of operation.

Oils and Pigments Used in Car Painting*

By H. G. Noble
Superintendent Everett Shops,
Boston Elevated Railway, Boston, Mass.

PIGMENTS most used for car painting are lead, carbon, zinc and lithopone. The old-fashioned idea that lead alone is the only satisfactory pigment for paint has been disapproved. In many instances other pigments do quite as well and in some cases produce a paint which does better than straight lead. For outside work, lead in combination with other pigments is still the most generally used. Lead alone chalks too much and does not give the maximum whiteness due to the chalky surface picking up dust, etc. Zinc oxide, which is today almost universally used in combination with lead and other pigments, is the finest of all and very white in color. Owing to its extreme fineness, it requires more oil than any other white pigment to become fit for the brush. In 100 lb. of the zinc oxide paint ready for use, there are 46 lb. of oil to 54 lb. of zinc, while in the same proportion in corroded white lead of the same consistency there are 76 lb. of pigment to 24 lb. of oil. Owing to the fact that zinc oxide is not affected by any gases present in the atmosphere and that it does not affect other pigments with which it has been mixed, it is very extensively used in high-grade white paint and enamel for both inside and outside use.

Carbon pigments are quite extensively used in the manufacture of metal protective paints. The carbon blacks are practically pure carbon. They comprise lamp black, a specially prepared soot from oil lamps, gas black from natural gas, and graphite, which is a natural product now also produced artificially by means of an electric furnace. These pigments are chemically inert. The particles are extremely fine, and their specific gravity low. Consequently, they require a large amount of oil to make them fit for the brush. Their covering and wearing capacity is a striking example of the durability of inert pigments when used in painting. As proof of their durability, lampblack lettering on old signs has been frequently known to stand out in relief after the wood surrounding it has been deeply worn away by the elements. One reason lamp blacks are so permanent is that they have no drying properties like lead, and therefore prevent the burning up of the oil film due to progressive oxidation.

Lithopone is essentially a combination of co-precipitated zinc sulphate and barium sulphate, which reacts chemically to form a compound, roughly making 30 per cent zinc sulphate and 70 per cent barium sulphate. This pigment is very fine and white, and if properly made has excellent body and other very valuable properties as a pigment. It darkens in the sunlight and recovers its color in the dark. Most of the lithopone now made is practically lightproof. Lithopone is used to make interior paints, first coat or primer whites, flat whites, and all finishes, and the lighter shades of floor plaint. It is very extensively used in combination with zinc to make the so-called mill white enamel.

*Abstract of a paper presented before the New England Street Railway Club, Boston, Mass., May 28, 1925.

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Earth colors are compounds found as deposits in the earth and are utilized as pigments, either in their natural state or after grinding. The principal varieties are the mineral brown, ochres, umbers, siennas, natural iron oxides, and mineral black. Of the earth pigments most commonly brought before the layman are the iron oxides which range in color from warm brown to a brilliant scarlet, depending upon the composition of the original mineral and the degree of oxidation. The thousands of freight cars in operation on the various railroads, which are all painted with iron oxide paint, give a good idea of the enormous quantity of this pigment which is used. Venetian red, one of the most popular and durable of red oxides, is made in large quantities by roasting copperas, the byproduct from pickling iron. Most of the Venetian reds contain calcium sulphate, as the copperas is generally mixed with lime before roasting.

Chemical colors are pigments produced by chemical action of one substance (usually in solution) upon another resulting in the precipitation of a colored compound. Linseed oil is usually preferred for the manufacture of outside paint and enamel. It is the most abundantly obtainable of all oil and its cost is usually moderate. Results obtained with it are more uniform than with any other oil, and it produces a very tough film, which allows for the expansion and contraction of the surface to which it has been applied. Linseed and perilla are drying oils. Chinawood or tung oil is used more for the manufacture of waterproof varnishes, floor paints and enamels than in paint. It is also used to a considerable extent in the making of flat wall finishes. The oil requires special heat treatment.

Turpentine or thinners are added to paint for the mechanical effect, to facilitate the labor of spreading, to reduce excessive amounts of oil, to hasten setting of paint, to assist the penetration of the priming coat, to reduce the gloss of the undercoat and thus improve the adhesion of subsequent coats and to destroy the gloss in a finishing coat where an eggshell finishing coat is desired. For this class of work, turpentine, wood turpentine, substitute turpentine, benzine and mineral spirits are most generally used. The greatly decreasing supply of pure spirits of turpentine has forced customers into the adoption of substitutes made from mineral oils, and experience seems to show that in the majority of cases a good substitute turpentine answers quite as well as pure spirits. The fact that both turpentine and turpentine substitutes are volatiles and on exposure to the air evaporate rapidly and pass out of the paint, having no real effect on the paint film, leads to the conclusion that, in the majority of cases, one answers as well as the other.

In the past, when labor was cheap and time meant nothing, it was customary to apply a flat color and then apply a coat of rubbing varnish when painting the cars. After rubbing, a coat of finishing varnish was applied to obtain a high gloss finished job. With labor costs high and time a big item, it has become necessary to produce a finish which will cut down labor costs and save time. The result is the perfection of an enamel paint, which is a combination of color and varnish properly blended and which combine two operations in one. Enamels, like paints, are composed of liquids and pigments. The pigments used in making enamels are a great deal the same as those used in making paints, except that zinc is used almost entirely in place of the lead in producing the white. Practically all of the high-grade white enamels contain nothing but zinc oxide, while the colored enamels may be a combination of zinc and a predetermined coloring pigment or it may be a straight color pigment.

The vehicle in an enamel is a varnish which is a combination of varnish gum and oil. Several grades of this varnish are used in making enamels. These range from a short oil rosin varnish up to a long oil Kauri gum varnish. The short oil enamels are very quick drying and do not render long service. The long oil enamels are slower drying, easier working and very long lived.

The oils used in making the lighter colored enamels must be bleached before being made into varnish vehicle, as it is really the oil or vehicle in any paint or enamel which gives it its life or wearing properties. A long oil enamel for all exposed surfaces is really the only satisfactory material to use, as it costs just as much and more to apply cheap paint or enamel than to apply a first quality product.

Undercoats Deserve Attention

Paint or enamel may be applied by brush, spray or dipping. There are great differences of opinion as to the best methods of application; each, however, has its place. Too much emphasis cannot be made as to the proper preparation of the job on hand and the proper application of the undercoats, for unless the surface and undercoats are right, the finish coat, no matter how good, will fail. We never apply paint to unseasoned wood or damp or wet surfaces and shellac all sappy spots in new wood. All surfaces should be thoroughly cleaned before repainting, and metal surfaces must be thoroughly brushed off to remove rust before painting. Sufficient time must be allowed before the application of the various coats. When using a product of some paint manufacturer, the instructions given on the container should be followed carefully. The manufacturer has probably been in the business for years and is just as anxious as you are to have the material give a satisfactory job.

I have often been asked whether I do not think better results can be obtained by making up our own formulas and putting them out for bids. To this I can answer, positively, no. For in putting out specifications for bids, the unscrupulous are allowed to quote against the honest manufacturer, and the man buying the goods can only place his orders with the lowest bidder. To add to this, the minute you accept a paint made under specification different from any manufacturer, his responsibility ceases. He will simply tell you if the paint fails that it was made in accordance with your specifications, and if it has failed it is up to you. Even a chemical analysis of a specification paint will not be of assistance; it will only indicate to the chemist whether the paint is properly compounded, but the method of preparation, which is quite as important as the composition, will not be known.

Central Master Mechanics Meet at French Lick, Ind.

PROGRESS reports of various committees were made at a short business meeting of the Central Electric Railway Master Mechanics Association, held at French Lick, Ind., during the annual summer meeting of the Central Electric Railway Association. These included reports from the committees on standards, uniform charges for the repair in interchanged cars, United States safety appliances, program, and membership.

As a result of a careful search of past records, the committee on standards had compiled a record of all previous equipment standards of the Central Association. These were outlined in the report, from which it developed that most of these standards are quite old and in many cases obsolete. The committee was commended for its careful work, and it was the opinion of the meeting that all standards which have become obsolete should be weeded out and discarded. P. V. C. See, superintendent of equipment Northern Ohio Traction & Light Company, Akron, Ohio, suggested that a standard of marking for freight equipment in the association territory would be very desirable, and that a study of this matter might properly be made by the standards committee. The subject was referred to the committee.

Discussion took place regarding the need for running boards on top of electric railway freight cars, and of ladders on the sides of the cars. It was pointed out that although the electric lines in the Central territory have had no particular difficulty during many years of operation, there is a potential danger until a full understanding is obtained with the Interstate Commerce Commission relative to electric railway conditions, and necessary modifications made of the rulings of the commission to take care of electric railway conditions. It was decided that when the committee has completed its report the association should consider the best course to follow in clearing up this situation.

The progress report of the committee on uniform repair charges stated that this committee is compiling cost data to be used as the basis for making up a schedule of charges. Considerable study has been given the matter of labor costs, with the object of selecting a rate which would be equitable under the variable wage scales on the various roads. A tentative rate of 70 cents per hour is being considered.

The next regular meeting of the association will be held at the Grand Hotel in Anderson, Ind., on Sept. 10, 1925. This is just one day before the meeting of the Central Electric Railway Traffic Association, which is to be held at Webster Lake, Ind., on Sept. 11 and 12.

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American Association News

Executive Committee

MONTREAL was the place of meeting of the executive committee of the American Electric Railway Association held on June 10, the members being guests of Col. J. E. Hutcheson of the Montreal Tramways. Members present were: President J. N. Shannahan, Managing Director L. S. Storrs, Executive Secretary J. W. Welsh, R. P. Stevens, E. P. Waller, L. H. Palmer, W. H. Sawyer, C. E. Morgan, C. E. Stephens representing F. D. Shute, F. R. Coates, H. D. Briggs, T. C. Cherry, C. S. Hawley, A. A. Hale and L. E. Gould. Guests present were Labert St. Clair, J. W. Colton, H. L. Brown and Morris Buck.

After approval of the minutes of the last meeting, Mr. Welsh read the revised budget for the year. He stated that the association is doing somewhat better than was anticipated in view of the expenditures made necessary by its increased activities, and that there probably will be a small surplus at the end of the year. Dues, he said, are coming in in good shape. Reports of the various committees are being prepared and will probably be ready for printing by July 1.

Mr. Stevens read the report of the auditors for the association. All accounts were found in good condition. The report of this committee was approved and placed on file.

Mr. Storrs reported on the status of motor vehicle common carrier legislation.

For the subjects and meetings committee, Mr. Sawyer explained the status of the program for the October convention. Mr. Coates proposed the use of the Hippodrome in place of the Greek Temple for holding meetings. After some discussion, it was decided that, since space for exhibits had been sold with the understanding that all meetings would be held at the end of the pier, no change be made in the meeting places for this year. President Shannahan suggested that in the past the attempt had been made to place too many subjects on the program. Accordingly, he thought that the program should be restricted this year as far as consistent with the idea of getting better quality of papers and discussions.

For the publicity committee, Mr. Welsh stated that it has assisted in the preparation of a number of articles by special writers dealing with electric railways. A booklet telling of the various kinds of work available in the industry for young men has been prepared for sending to the colleges for distribution.

Mr. Palmer read the report of the committee on publications, giving the present status of *Aera*. This report was adopted.

Mr. Storrs reported regarding the matter of handling funds for the Advisory Council. The council has passed a resolution recommending that such funds be kept in a separate account, from which payments should be made with the approval of the executive committee and the managing director. This was approved by the executive committee. Mr. Shannahan told of the method which has been adopted for solicitation of funds for the Advisory Council. It has been planned to request each member company to make a voluntary contribution. After some discussion, Mr. Sawyer and Mr. Coates were appointed a committee to solicit subscriptions.

Mr. Palmer, for the committee on company and associate membership, stated that seven new members have applied for admission. These were the Warren Street Railway, the General Engineering & Management Company, the Adams & Westlake Company, the Lovejoy Manufacturing Company, John Lucas & Company, the Norma-Hoffmann Bearings Company, and the Pennsylvania Rubber Company. All of these applicants were elected.

For the committee on individual membership, Mr. Morgan stated that the membership has had a net increase of five. The Metropolitan Section, he said, now has over 1,000 members.

Mr. Morgan, on behalf of the exhibit committee, stated that the space sold this year to date is 33,304 sq.ft., as compared with 29,936 sq.ft. at the corresponding time last year. Space under the control of the exhibit committee has been reserved for the display of double-deck buses near the Shelburne Hotel. The relative space being used for automotive equipment this year will be approximately the same as it was last year.

The following nominating committee was announced by President Shannahan: T. N. McCarter, chairman; C. D. Emmons, J. H. McGraw, T. W. Casey, Thomas Fitzgerald, Richard Merriwether and G. J. Kuhrts. The appointment of this committee was approved.

Mr. Stevens reported on the status of referendum 45 of the United States Chamber of Commerce and Mr. Welsh read Mr. Gadsden's report on referendum 46. His report was accepted.

The committee on revision of the constitution presented a report containing several proposed changes in the scope of the association to include other forms of transportation, such as the motor bus, the trolley bus and the gas rail car, when operated by or in conjunction with electric railway companies. Changes to provide for the Advisory Council and the managing director also are included. These were read by Mr. Sawyer of the committee, in the absence of Chairman Emmons. After adoption by sections, the entire constitution was approved for submission to the membership. A vote of thanks was given to the committee for the excellent work it has done.

On motion of Mr. Sawyer, a resolution extending the thanks of the executive committee to Colonel Hutcheson for his hospitality in entertaining the committee was passed unanimously.

It was decided that the next regular meeting of the executive committee would be held at Atlantic City next October, in connection with the convention.

Way Matters

REPORTS of various sub-committees were received and adopted at a two-day meeting of the committee on way matters held in New York City June 8 and 9. In the matter of the review of existing standards there was some discussion regarding the iron binding under special trackwork pieces. The committee agreed to recommend the continuation of the study of this subject to the ensuing committee and voted to request the ensuing committee to consider redrawing such plans of other associations as are required for the manual.

A brief report on the subject of standardization of frogs and switches was presented. Little progress has been made since the last meeting. A comprehensive report on surface hardening of rails was adopted. Some changes were made in the report on design and specifications for railroad crossings. It was then adopted.

Reduction of noise in car operation was discussed at considerable length by the committee and some amendments made to the report, after which it was adopted. The committee voted to recommend the continuation of the study of the subject by a special joint committee of way and equipment engineers. A report on the design of substitute ties was amended and adopted.

Information presented on the subject of arc welding repairs to tracks and welding rod specifications caused a lengthy discussion. The committee voted to recommend the publication of the American Welding Society specifications in the report and to continue the study of the subject.

Tolerances and the milling of rail ends were discussed in connection with the work of the special committee to confer with the American Society for Testing Materials. The way committee voted to oppose increasing of the carbon in the girder rail specifications and decided if higher carbon was desired by the steam roads they should prepare a class "C" specification and submit same to A. E. R. E. A. and the A. S. T. M. in the regular way. No report was submitted on the design of limit of wear gage, wheel mounting, etc., because the sub-committee is waiting for information from the equipment committee.

Welded rail joint tests now being made were considered. The committee on way matters decided to take no action on the question of modification of the repeated impact tests, as it was felt the committee on welded rail joints was handling the matter satisfactorily.

Members present were: E. M. T. Ryder, J. H. Haylow, E. B. Entwisle, C. A. Alden, C. L. Hawkins, V. Angerer, O. C. Rehfuss, J. B. Tinnon, D. J. Graham, M. M. Johnston, T. J. Lavan, E. L. Lockman, H. E. Bean, W. W. Wysor, C. F. Gailor, A. T. Spencer, R. H. Dalgleish, sponsor, and H. H. George, chairman.

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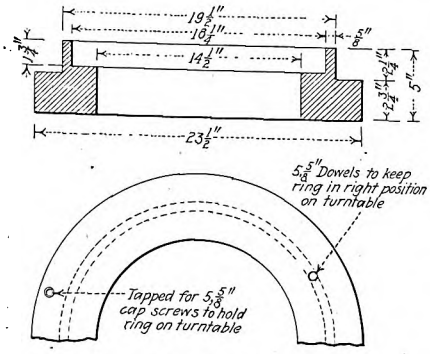
Maintenance of Equipment

Boring Armature Bearing Housings

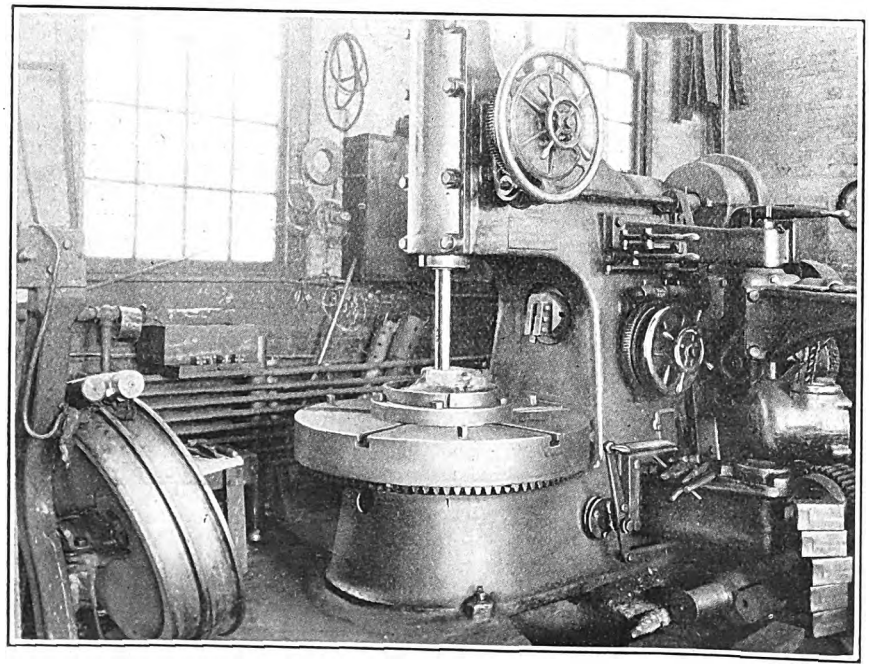
SPECIAL precautions are taken in boring out the bearing fits in the housings of Westinghouse type 306 CV railway motors at the Utica Park shops of the New York State Railways. The work is done on a large Niles-Bement-Pond boring mill.

The feature is the fixture used to hold the housings in alignment. The same fixture is used for both the pinion-end and commutator-end housings. It consists of a cast-steel ring with different diameters provided to fit the two housings. The pinion-end housing is bolted to the ring having a diameter of 18¼ in., and the inner ring, 14½ in. diameter, is used for bolting the commutator-end housings in position. The same holes are used for bolting the housings to the ring as are used for holding them in the motor frame. The ring is held in position on the turning table of the boring mill by five ⅝-in. dowel pins and five ⅝-in. cap screws.

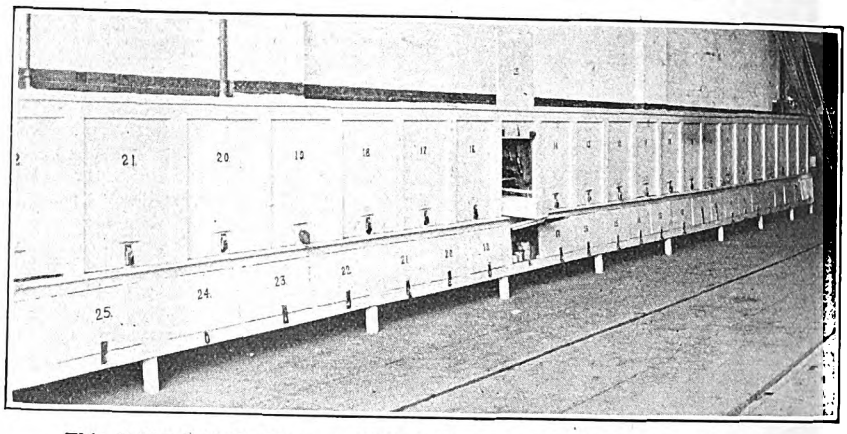


Ring Fixture for Holding Housings Accurately During Boring Operation

The boring bar has a micrometer adjustment for the cutting tool, so that accurate boring is assured. A bushing is provided in the jig for the bottom end of the boring bar to prevent chattering and insure accurate alignment.



Boring a Pinion-End Housing in the Utica Park Shops of the New York State Railways



This Cabinet, Built Along a Wall of the Carpenter Repair Shop in Dallas, Provides a Place for Workmen to Keep Tools and Supplies

Cabinet for Workmen's Tools and Supplies

BY J. L. BROWN
Master Mechanic Dallas Railway, Dallas, Tex.

SUPPLIES, tools and tool boxes used by carpenters in the car repair shop usually present a difficult problem from the standpoint of keeping the repair shop looking neat and clean. At the same time, some provision must be made to give these men a place to lock up tools that are their personal property or that are assigned to them. As a result, tool boxes or cabinets are sometimes scattered about near the jobs on which men are working, and continual vigilance is necessary to prevent a very disorderly general appearance.

Some time ago the tool cabinet shown in the accompanying illustration was built in the shops of the Dallas Railway. Each of the compartments is in two sections. The larger one, above, is used for tools, while the smaller cabinet, below, is used for storing screws and other miscellaneous supplies that have been drawn out of stock for a particular job.

The cabinet is built along the wall at one side of the repair shop, where it is readily accessible and handy for the men working on cars in the shop. Each section is provided with locks, so that the contents cannot be disturbed.

By insisting that men keep their supplies in the lockers provided for them, the general appearance of the

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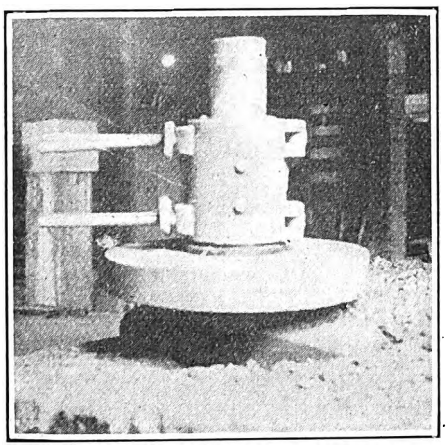
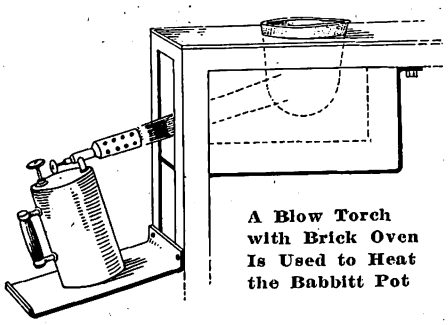
shop is improved very much over previous conditions. The total cost of building the cabinet was small and is considered well justified from the standpoint of good housekeeping.

Babbitted Bearings Give Long Life

SIMPLE apparatus for rebabbitting bearings has given satisfactory results on the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y. Because this company operates a total of only about 25 cars the expense of installing elaborate equipment for babbitting would not be justified. A gasoline blow torch mounted on a shelf alongside the babbitting table is used to heat the metal. The latter is contained in a babbitt pot of the ordinary type suspended by its upper rim from the surface of the table. Thus the lower part of the bucket extends under the table, where a fire-brick oven has been constructed on a shelf. An opening in the fire brick allows the flame of the blow torch to be directed against the under part of the bucket. The arrangement of this apparatus is shown in an accompanying diagram.

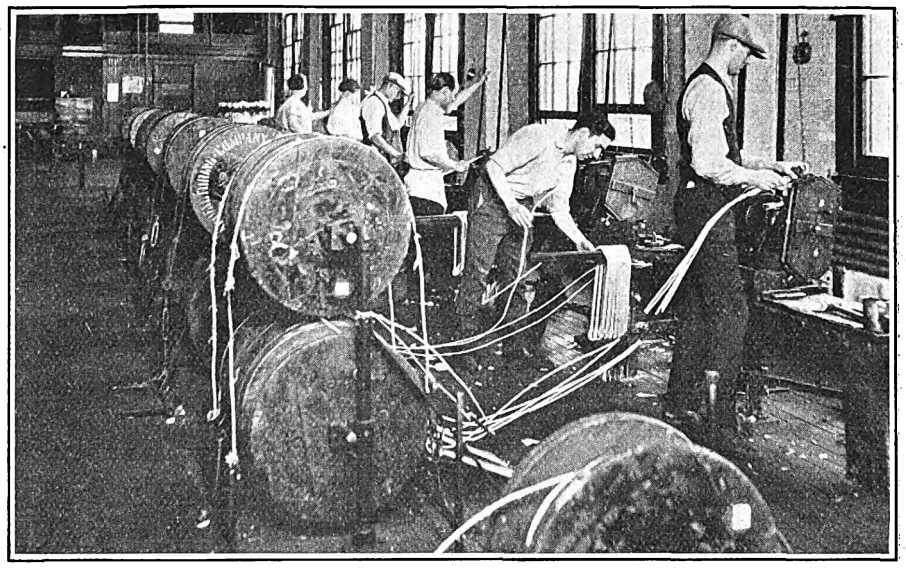


Bearings Removed from the Mandrel by This Clamp Are Immediately Quenched



A Blow Torch with Brick Oven Is Used to Heat the Babbitt Pot

A hinged holder has been arranged to fit around a bearing to be babbitted. The latter is slipped down over a mandrel and held in place by the clamp as shown in an accompanying illustration. Handles are provided so that the babbitted bearing can be removed from the mandrel and immediately quenched in a tub of water standing alongside. Bearings rebabbitted in this way give an average life of 75,000 miles, approximately as good as that of new bearings.



Wire Is Kept Under Tension in Rewinding Armatures in the Homewood Shops of the Pittsburgh Railways

Keeping Tension on Armature Wire

COILED steel springs arranged as shown in the accompanying illustration are used in the Homewood shops of the Pittsburgh Railways to keep tension on the wire used in winding armatures. This wire is carried on reels mounted on horizontal rods. A double set of reels is used, one above the other. These are arranged in groups of two, three or four, according to the type of armature. The wires pass through a series of pulleys and then through a spacing rod. The pulleys are fastened to the floor by the springs, and similar springs are attached to bands passing over the reels. With this arrangement the winder must pull the wire against a steady but slight resistance. The reels are prevented by the braking device from revolving too rapidly and allowing the wire to slack off.

Outdoor Storage Rack for Bar Stock

BY J. T. PORTER
Master Mechanic Northern Texas Traction Company, Fort Worth, Tex.

STORAGE of bar stock usually takes a considerable amount of valuable space in the average railway blacksmith shop or storeroom. In addition this material is difficult to store so that it is readily accessible.

In the accompanying illustration

This Outdoor Storage Rack in Fort Worth Provides a Convenient Place for Storing Bar Stock and Spare Car Parts

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is shown an outdoor set of racks which have proved convenient in Fort Worth. A number of wood posts are set into the ground in the shop yard immediately back of the blacksmith shop and covered with a corrugated iron roof on a rough frame. Wooden cross-members are bolted to each post and extend out on each side so as to provide storage space for a large amount of material. In addition to bar stock, these racks are used for spare pull rods, brake beams, hand brake staffs and other parts which usually present an awkward storage problem.

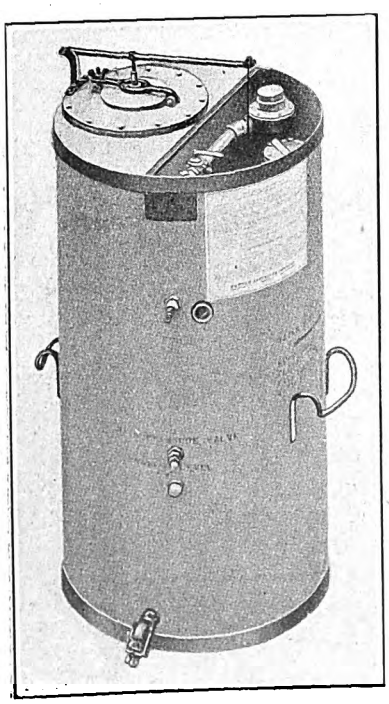
New Equipment Available

Portable Acetylene Generator

A SMALL generator to produce acetylene at low pressure for welding and cutting has recently been developed by the Oxweld Acetylene Company, New York, N. Y. This supplements a line of larger generators which are used to supply pipe lines in electric railway shops where much cutting and welding is done.

The new generator takes 35 lb. of carbide at one charge and can be transported readily from place to place, thus providing a portable supply of generated acetylene gas. Empty, the generator weighs 210 lb.

An entirely new principle of feed control is used which might be called a "heavier-than-water" float. A vertical partition, extending nearly to the bottom into a water seal, divides the generator shell. One side is gastight and contains the carbide hopper at the top. The upper part of the other side contains gas regulating and protective devices and an automatic carbide feed control. Generation of the first acetylene causes water to rise on this side of the partition high enough to all but submerge a pan full of water, hung to a control lever. This pan acts normally as a weight acting counter to a spring, but as the water rises about it, its apparent weight is diminished and the carbide hopper valve is closed by the action of the spring. As acetylene is drawn off, water rises in the gas compartment and correspondingly lowers under the float, relieving some of the buoyancy under the water pan, which, gathering weight with the receding water, depresses the spring and allows a small amount of carbide to drop into the generator and restore equilibrium.



Acetylene Generator Takes 35 Lb. of Carbide at One Charge

Because of its low center of gravity, the generator rights itself when tilted at an angle of 30 deg. It works perfectly at an inclination of upward of 10 deg. No adverse effects result if a generator is knocked over while in operation. Nearly all fittings are inclosed in the cylindrical shell and there is practically nothing projecting which may be injured by a fall on a concrete pavement.

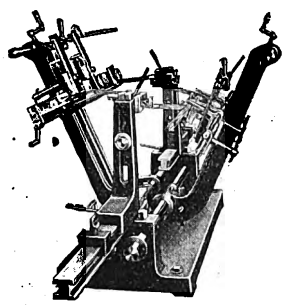
This generator has been submitted to the Underwriters' Laboratories, Inc., and has been listed by them as an acceptable device for installation.

Switchboard Instruments

TWO new lines of direct current panel-type instruments for switchboard mounting have been brought out by the Roller-Smith Company, New York, N. Y. These instruments include milli-ammeters, voltmeters, milli-voltmeters and volt-ammeters. Type TD instruments are 3½ in. in diameter and type F instruments 4½ in. in diameter. They employ the d'Arsonval mechanism, which the Roller-Smith Company has brought to a high degree of refinement.

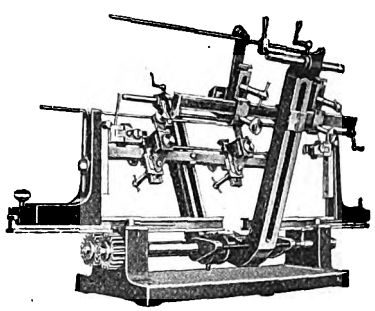
Improved Armature Coil Spreader

IMPROVEMENTS have been made in the Segur armature coil spreader and the new machine is now being placed on the market by the Electric Service Supplies Company, Philadelphia, Pa. An improved design for the coil blocks and end supporting knuckles enables the machine accurately to duplicate the angular relation of the slot portion of the coils. The parts are lever operated, which does away with loose parts, such as bolts, pins, toggles, etc. The supporting knuckles have adjustable side plates made of fiber. These can be renewed when necessary. The coil blocks are adjustable for both height and width of coils and are made entirely of steel, case hardened at wearing points. One movement of a single arm controls both coil blocks, either front or back, thus reducing the number of operations.



Spreader with Coil in Position after Being Spread

The holding plate of the coil blocks is within the operator's control at all times and is arranged so that loops can be spread before varnishing where this is desired. Authorities, however, have recommended that loops be varnished and baked before spreading, as this process toughens the cotton or silk insulation. The coil-forming device is adaptable for practically any standard type of coil, and the improvements reduce the number of hand operations.



Improved Coil Spreader in Open Position

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The News of the Industry

Nine Cents Cash in Cincinnati

Initial Fare Fixed for New Franchise Under Which Cincinnati Street Railway Will Operate

Six tickets for 50 cents, or a 9-cent cash fare, has been agreed upon by representatives of the Cincinnati Street Railway and the Council committee on street railroads as the initial fare to be provided for in the new traction franchise. While the new proposal with its amendments will likely be passed by Council on July 1, its provision will not become effective until Oct. 1.

The conferees also have agreed that approximately $300,000 will be set aside each year from the earnings of the company for the redemption of $3,000,000 reducible capital, so that at the end of ten years the permanent capital of the operating company will not exceed $25,000,000, the amount set by the Mayor's Citizens Traction Committee. A tentative draft of the provision relating to the amortization of the $3,000,000 reducible capital has been presented to the city administration. The provision in substance sets forth that whenever the fare control fund exceeds $400,000 the excess, unless otherwise ordered by the Director of Street Railroads, shall be placed in a separate fund to be controlled by two trustees, one to be selected by the director and the other by the operating company. The trustees are to purchase capital stock of the company in the open market in an amount not to exceed $300,000 in any one year. The stock so purchased is to be canceled.

TRAFFIC FALLING OFF

It has been announced that the 7½-cent fare agreed upon in the franchise rejected by the Mayor's committee cannot be accepted as the initial rate of fare at this time. That fare was predicated upon the assumption that the franchise would be in operation on Jan. 1 of this year and that because of the reduced fare the number of riders for the year would probably run to a total in excess of 103,000,000 revenue passengers.

Failure of the committee at the last moment to agree to the terms of the proposed franchise continued the Cincinnati Traction Company as the operating company and also a 10-cent rate of fare. As a result there has been a steady decrease in the number of revenue passengers. If the same ratio of decrease is continued the aggregate number for the year will not exceed 95,000,000.

The amortization for the reduction of the capital is a modification of a suggestion made by A. E. Anderson of the citizens' committee and former City Solicitor Saul Zielonka. That the Cincinnati, Lawrenceburg & Aurora Electric Street Railroad may be brought into the heart of Cincinnati over the tracks of the Cincinnati Street Railway has been announced as a possibility by Samuel Assur, representing the railway. However, Mr. Assur said that this matter depended upon the proposed franchise being ratified by the City Council and that the street railway again assumes operation of the service system.

Stockholder Acts to Protect Nashville Property

M. S. Adams, Mobile, a stockholder of the Nashville Railway & Light Company, has brought suit to have declared unconstitutional and void the law enacted in 1925 by the Legislature abolishing the operation of one-man cars in the cities of Tennessee with more than 30,000 population. The complainant alleges that compliance with the act would severely affect his interests in the defendant corporation and his property rights as a stockholder. He filed the bill as a matter of self-protection. If the Nashville company obeys this act, the complainant asserts, it must retire from service ten cars at a loss of approximately $60,000, remodel 36 other cars at a cost of $15,000 and purchase eight new cars at a cost of $88,000. The answer of the company was filed at the same time as the complainant's bill. It admits the truth of his allegations, another of which is that the classification of cities sought to be fixed is "arbitrary and capricious."

Detroit Dismissals Reviewed

Messrs. Schram, Merritt and Wilcox Out of Municipal Railway—Mayor and Schram Issue Contradictory Statements

ACTING on instructions from Mayor John W. Smith, the Street Railway Commission at Detroit dismissed Ross Schram, general manager of the Department of Street Railways, and also removed I. N. Merritt as auditor. Col. H. U. Wallace has been made general manager, but the position of auditor has not yet been filled. Announcement of these changes was made on June 5. The same day C. E. Wilcox resigned as claims attorney.

According to a statement given out by Mayor Smith following the commission's action the resignation of Mr. Schram was asked because of "inexperience and inefficiency" and because Mr. Schram did not have the true picture of the transportation situation in Detroit. The earnings of the D. S. R., according to the Mayor's statement, have been steadily decreasing. This was attributed by Mr. Schram to the fact that industrial conditions have been bad. The Mayor denied this was true and cited that the earnings of the jitneys and of the Detroit Motorbus Company have been steadily increasing, while the revenue from car riders has been falling off.

The city's chief executive stated that he is responsible to the people for the operations of the street railways, but that he knew no more about the inner workings than the most disinterested citizen, because Mr. Schram and Mr. Merritt had constantly shown themselves unable to work with him and with the Common Council and because they had neglected to furnish him with reports which he had repeatedly requested.

Mayor Smith further cited that only recently Mr. Schram employed a firm to audit the D. S. R. books without consulting the chief executive, and that courtesy due the office of Mayor had not been extended by Mr. Schram or Mr. Merritt. He further charged that both had shown lack of ability to get along with the men working under them and with the City Council.

In commenting upon the action which they took at the Mayor's request, one of the street railway commissioners stated that he believed Mr. Schram was doing a good job as manager of the D. S. R. The reports of the department showed it to be on a sound financial basis. Commissioners Barlum and Esselstyn comprised the majority that removed Schram and appointed Colonel Wallace. The third member of the commission, E. Ogden Ellis, is in Europe. Mr. Esselstyn was appointed to the commission by former Mayor James Couzens and Mr. Barlum was named by Frank E. Doremus when he was Mayor.

Mr. Schram's removal from the position as general manager has been considered inevitable ever since last November, when Mayor Smith was elected. The Mayor kept in mind the desirability of persuading the existing commission if possible that Mr. Schram's removal would be for the good of the service, without making any change in the personnel of the commission.

Upon being requested to resign Mr. Schram asked that an audit be made of the D. S. R. accounts. This proposal was agreed to by the commissioners. He will aid the new general manager in taking hold of affairs.

Mayor Smith's statement of June 5 follows:

> The resignation of Mr. Schram was asked because of inexperience and inefficiency, and because Mr. Schram did not have the true picture of the transportation situation in Detroit.

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The earnings of the D. S. R. have been steadily decreasing and Mr. Schram has attributed this to the fact that industrial conditions have been bad. This is not true. The earnings of the jitney buses and the Detroit Motorbus Company have been steadily increasing, while the revenue from car riders has been falling off.

I am the chief executive of the city and the one who is responsible to the people for the operations of this railway line, and I know no more about its inner workings than the most disinterested citizen. This is because Mr. Schram and Mr. Merritt have constantly shown themselves unable to work with me and with the Common Council, and because they have neglected to furnish me with reports which I have repeatedly requested.

In reply Mr. Schram said:

As a matter of fact, I frequently went to the Mayor's office to consult with him, to ascertain his wishes, and to offer to give him any information he desired. To this the Mayor has invariably replied, with a grin: "The commission is running the street railway. I know nothing about it."

When I sought to lay a serious problem before him, so that he could intelligently co-operate in its solution, the Mayor would continue his grin and his silence, reserving any comments he may have had for the political supporters who were continually urging him to get rid of me, as he had promised them he would do. He was so busy looking for a successor to me that I could not get him to concentrate on important matters having to do with the street railway, and it appeared futile to try to get such concentration from him. About all the contact the department was able to have with the Mayor was through his secretary.

The Mayor refused time after time to approve of the minutes of the meetings of the Street Railway Commission, and I received a letter from him saying he was not going to approve them. He deliberately shut himself out from any information he needed to know about what the D. S. R. was doing.

The *Free Press* said in part:

Ross Schram was given a place under the Street Railway Commission not in the least because he was considered specially qualified by experience or ability for the executive jobs he successively held. If Mr. Schram now has lost his place partly as a result of a turn of the political wheel he has no legitimate grounds for complaint. There is no record of brilliant achievement which indicates his elimination from the scheme of municipal operation is going to be a loss to the city if an ordinarily competent man has been chosen as his successor. The new general manager can make himself *persona grata* with the general public by seeing that something better than cattle car accommodations are henceforth provided in exchange for the fares collected.

The *News* said in part:

Inexperience and inefficiency are broad charges. The first could be applied to the Mayor himself, who never held a city office before his election. If he considers inexperience in itself a valid ground for ousting a public servant, Mayor Smith should resign, for his experience is less than Mr. Schram's by several years.

Financially the city's railways are in an enviable position, and they are giving excellent service at a rate of fare considerably lower than that charged in most other cities, while the employees draw the highest pay in the country.

The reason for Mr. Schram's dismissal is not "inexperience" or "inefficiency." It is politics, and Mayor Smith would have been honest if he had said so. It is the only reason by which he can defend his action. And that reason is indefensible.

Conference on Bus Seniority

At a recent conference between John K. Punderford, president of the Connecticut Company, New Haven, Conn., and the members of the trolleymen's wage conference board negotiations were started for the settlement of the wage controversy and establishment of an understanding relative to the operation of buses. The men have explained that they want the company to recognize the seniority rule in the selection of drivers for the buses. Employees charge that the company has been engaging bus drivers who have never before been in the trolley service. Under the seniority rule employed by the company the men who have served the longest terms are given preference in the selection of lines over which they operate. Mr. Punderford declined to comment upon his view of the seniority rule as applied to the buses.

Wage Scale Renewed at Chicago

The Chicago Surface Lines and its employees have entered into a new contract continuing the wage scale of 75 cents an hour. The negotiations were carried through to a settlement harmoniously after the union, through William Quinlan, president of Local 241, had asked for 80 cents and many changes in working conditions. The company offered 70 cents.

The new contract continues an arrangement made by an arbitrator three years ago which brought the wage up to the present figure on a sliding scale. The arbitration ended a three-day strike.

The Surface Lines submitted that prices are lower now than they were three years ago, when the men walked out, and that to grant the figure of 80 cents would be impossible because it would mean an increase over the present fare of 7 cents.

The company agreed to arrange night runs, as far as possible, to end at 7 o'clock in the morning or earlier.

The settlement virtually fixed the scale for the Chicago Rapid Transit Company, operating the elevated lines.

Board Ends Grand Rapids Controversy

The board of arbitration which has been hearing evidence in a controversy between the Grand Rapids Railway, Grand Rapids, Mich., and the local division of the Amalgamated over six cases of dismissal has rendered its decision. Four probationers and two old employees had been dismissed from the service and the union protested, charging discrimination and seeking their reinstatement. The company based its action on its responsibility to patrons and assurance of safety to the public.

In dealing with the probationers' case, the arbiters' decision was that conductors, motormen and operators who are serving the 90-day probationary period are not entitled to full protection of the contract between the company and the union employees. The decision advises the agreements with the company by both the union and the employees' association be amended to forbid soliciting probationers for membership to avoid irritating rivalry.

In the case of a man with 29 years' service, the arbitrators substituted for discharge a suspension of 30 days without pay for colliding his car with a city tractor, and in the case of a platform man of two years' service, dismissed for calling a fellow employee "a scab," the board reinstated him, but imposed in place of discharge suspension for fourteen days without pay.

The board of arbitration said that the maintenance of adequate and careful service was essential.

Union Willing to Arbitrate in Davenport

The suggestion that arbitration be entered into between the men and the Tri-City Railway, Davenport, Iowa, made by representatives of the union in conference with R. J. Smith, general manager, has been adopted.

The union has addressed a communication to Mr. Smith announcing its willingness to accept the working agreement offered by the company on May 28, provided that it carries a clause covering the scale of wages now in effect. The union has submitted a tentative arbitration agreement to the company providing that the board shall agree upon the wages to be paid the men, including trainmen and shopmen, and that any awards shall be retroactive to June 1. The agreement also provides that the board shall be selected in the same manner as the one which was in effect June 1, 1922, to May 31, 1923.

In Illinois a slight increase will be asked, possibly to 60 cents an hour. The present rate is 58½ cents.

Two Arbitrators Chosen for Boston Arbitration

Fred A. Cummings, vice-president of the Eastern Massachusetts Street Railway, Boston, Mass., has been appointed arbitrator for the company in the negotiations looking toward a new wage agreement. James H. Vahey has been selected by the carmen's union to act as arbitrator for the employees. The third man has not been agreed upon.

The wage scale of employees of the Eastern Massachusetts Street Railway expired on May 1, 1925. The present scale, in cents per hour, is:

First three months	52.5
Next nine months	55.5
Thereafter	58.0

One-man car operators, 5c. an hour extra.

These rates became effective May 2, 1923, and were to have expired May 1, 1924. On July 2, 1924, however, they were renewed for another year.

The men are asking for an increase in the basic rate from the present level of 58 cents to a new one of 70 cents. The present level was incorrectly given in ELECTRIC RAILWAY JOURNAL, issue of May 30, page 864. The men are asking that the differential in favor of the operators of one-man cars be increased from the present rate of 5 cents to a new rate of 8 cents, so that if the request were granted about 95 per cent of the carmen in the employ of the Eastern Massachusetts would be drawing 78 cents an hour. All demands are merely bases for negotiations and it has not been agreed yet what to submit to arbitration.

Pittsburgh Sells 31,000 Weekly Passes

Reports for the first week of Pittsburgh's $1.50 weekly pass, started Monday, June 1, show a sale of more than 31,000. The sale of the 25-cent Sunday passes good for the same area exceeded 29,000 despite the fact that the weekly pass includes Sunday.

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Paving Restrictions Modified in Charleston

Onerous paving requirements have been removed at Charleston, S. C., by the adoption by the City Council of a resolution from the ways and means and streets committees and the board of public service granting a petition of the Charleston Consolidated Railway & Lighting Company asking that it be relieved of street paving and maintenance costs, except as damage be done to the paving by the operation of the cars. Originally the company was required to pay for paving between its tracks and 3 ft. on each side, but by an amendment in 1922 the bearing by the company of the cost of such work was reduced to one-half. The resolution adopted follows:

Whereas the Charleston Consolidated Railway & Lighting Company, successor to the Charleston City Railway, has petitioned City Council that:

1. The company be relieved of further charges for new paving or replacement of existing paving.

2. The company be relieved of the cost of maintaining paving along its tracks, except insomuch as such paving is destroyed or damaged by the operation of its cars or the maintenance of its tracks, and

Whereas conditions of travel and paving have materially changed since the granting of the franchise in 1897, and

Whereas City Council is desirous of relieving the railway of any unfair or undue hardship: therefore be it

Resolved, That section 11 of the franchise of the Charleston City Railway, dated March, 1897, as amended on Oct. 10, 1922, be further amended so the same shall read as follows:

Section 11. The Charleston City Railway shall at all times keep the space between the tracks and for 3 ft. outside in good repair, so as to conform to the condition of the balance of the streets upon which the road runs, except in such cases where, in the opinion of the company, damage or expense is not caused by the company, its cars or its tracks, then such expense be referred to the city engineer for his decision as to whether due by the company or not, but the decision of the engineer shall be reviewed by the Board of Public Service, and its finding and decision shall be final and binding on the company. In case any streets now unpaved or paved shall be paved or repaved, the said company shall bear and pay the city all added or additional expense which shall be incurred in paving such streets by reason of and due to the presence of the tracks of the company upon such streets, and generally, except where otherwise provided for in this grant, shall observe and obey the regulations, enactments and provisions contained in the General Ordinances of the City of Charleston, with reference to street railroads and the ordinances to be hereafter ordained amending the same.

City Holds Up Chicago Elevated Improvement

Plans prepared by the Chicago Rapid Transit Company for the extension of station platforms to permit the operation of longer trains are being delayed in their execution because the city has not yet granted permits for the extension of platforms on the loop. Unless authority is granted to extend the loop platforms, the west side lines would not get the benefit of longer train operation, as the platforms on the inner loop tracks are not of sufficient length to accommodate longer trains. The city administration has said that the permits on the loop will not be issued unless the company consents at its own expense to remove its columns from the street and place them on the curb line.

In that connection it is pointed out by the company that the original plans of the engineers provided for columns placed at the curb lines. The property owners refused to give frontage consent under those circumstances and in that they were supported by the then city administration and Council. The city ordered the company to place the supporting columns in the street and it had to comply if the loop was to be built. At that time there were few if any sub-basements under the sidewalks and the placing of the supports on the curb line would have been a comparatively simple problem. Today there are many basements under the sidewalks and this would make the relocation of the columns a difficult and expensive engineering problem.

Georgia Interurban Seeks Higher Fare—Opposition Intense

Suspension of service on the Atlanta Northern Railway, an interurban line running between Atlanta and Marietta, Ga., looms ahead for the second time as a result of opposition to a proposed increase in passenger rates asked of the Public Service Commission. The first public hearing on the increase in fare was held before the commission on June 4. It resulted in a heated argument between Preston S. Arkwright, president of the Georgia Railway & Power Company, which owns the road, and Judge Newt Morris, Marietta, who opposed any increase in the present rates.

In the opening statement before the commission Mr. Arkwright stated that during 1924 the Atlanta Northern fell more than $80,000 short of making an 8 per cent return on its actual investment and asked an increase of 1 cent for each zone—an increase from 6 to 7 cents—making a total increase of 7 cents between Atlanta and Marietta. He stated that the increase had been approved by a committee representing the Marietta City Council and the Chamber of Commerce, and that the increase in cost of commutation ticket books was only $1.50—from $8.50 to $10.

Judge Morris charged that the Georgia Railway & Power Company collected numerous charges from the Atlanta Northern Railway, including $38,000 for power, $45,000 for the rent of tracks and facilities, $8,000 for carhouse employees and $6,000 for station employees, in addition to taking 5 cents out of each fare for the transportation of passengers over the streets of Atlanta. He said these charges caused the books of the Atlanta Northern to show a loss for the year rather than a profit.

Following statements by Judge Morris that the Georgia Railway & Power Company had "terrorized" the people of Marietta into eliminating jitneys by suspending operations, Mr. Arkwright refused to answer any more questions on the part of Judge Morris, and Chairman Trammel of the commission abruptly closed the hearing.

Should the decision be adverse, the Atlanta Northern may suspend operations a second time, as railway officials have plainly indicated that they will not continue to operate the line at a loss. Should the increase be granted, it will be applied in the hope that operation at a profit may be achieved.

South Jacksonville Celebrating Successful Operation

South Jacksonville, Fla., is rejoicing again. The occasion this time is the anniversary of the opening of the railway a year ago. The record of the year shows that 800,000 passengers were carried and that approximately 10 per cent profit was made on the original investment. The city officials of South Jacksonville express their appreciation of the co-operation by officials of the Jacksonville Traction Company, which operates the road under contract. No damage case of importance was reported during the year.

The opening of an electric railway line owned by the city and operated by the Jacksonville Traction Company was celebrated by South Jacksonville on May 15, 1924. The service was the culmination of a two-year effort on the part of the people to secure railway service. At that time $100,000 in municipal bonds was voted by the citizens of South Jacksonville as the amount necessary to build the line to the corner of Hendricks Avenue and Pine Street.

The construction contract was let to Stone & Webster. City Engineer J. L. Crary acted as supervisor. By careful use of the funds the construction was accomplished for $73,000. This included an additional 1,156 ft. of track, bringing the car line to the corner of Atlantic Boulevard and Hendricks Avenue.

Since the installation of the service the tracks have been extended and are soon to be carried to the corner of Kings Road and Atlantic Boulevard. There is a car every fifteen minutes. The fact that only four cars are available has prevented the shortening of the schedule.

Paving Controversy in Ohio City

Bankruptcy for the Springfield Street Railway with consequent municipal operation is certain if the paving program contemplated by the city of Springfield, Ohio, for this summer is carried out. Paul C. Martin, president of the railway, in a statement issued June 10, declares that the proposed street improvements will involve expenditures of $100,000 by the company at a time when every monthly report of operations records a loss.

Robert W. Flack, city manager, declared that some satisfactory solution of the matter would be reached. Under the terms of its franchise the company is guaranteed a return of 6 per cent on the total value of its property, failing which, the lines may be taken over by the city if the company so elects. Mr. Martin declares the company does not wish to give up the property unless forced to it by additional financial burdens.

Contractors assert that a possible compromise will be reached by permitting the railway to retain old bases, ties, tracks, etc., and simply resurface its section of streets to be paved.

Some months back the company elected, under the terms of its franchise and provisions in its contract with the platform men, to establish one-man car service on most of the lines. Eighty per cent of the cars are being operated with one-man crews except during rush hours.

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Recent Bus Developments

Boston & Maine Plans White Mountain Service—New York State Railways Starts Resort Service

THE Boston & Maine Transportation Company, the subsidiary to handle the bus line business of the Boston & Maine Railroad, announces plans for operations between Boston and the White Mountains and between Boston and Portland, Me., possibly to go into operation by July 1.

The motor coach routes projected in New Hampshire are intended to provide service in new territory or to extend or supplement service now given by passenger trains of the Boston & Maine Railroad. It is reiterated that there is no intention to operate buses on lines paralleling the railroad in commuter zones. The lines for which approval of the New Hampshire commission is asked are: Plymouth to Lincoln, Franklin and Franklin Falls to Bridgewater, Concord to Dover and Concord to Sunapee and Newport, N. H.

The Boston & Maine Transportation Company is to operate motor coaches on the Boston-Portland run and in a service to the White Mountains, it is announced, "in an effort to determine for itself and for the public the extent to which such services may offer attractions not presented by the railroad, and the extent to which such services may be developed along sound, economic lines."

The coach service which the Boston & Maine Transportation Company is to substitute for the passenger trains on the York Harbor & Beach Railroad is expected to start on June 22 between Portsmouth and York Beach, with stops at the important seacoast towns and villages along the route. Within a week or two of that time it is expected that this service will be extended further between Ogunquit and Wells, as previously announced.

The Wisconsin Power & Light Company will operate one of its coaches, now in interurban service, on a daily trip, starting at 2 p.m., around and about Madison, Wis. This will be a sightseeing trip covering about 25 miles. Attractive circulars have been issued by the company describing the local tour plan.

The New York State Railways has opened bus service on three lines connecting Rochester and three lakeside summer resorts. The routes are to Island Cottage from the Dewey Avenue bus terminal for a 35-cent fare; from the city to Manitou Beach, via the Ridge Road and passing through Greece and Hilton, for one-way fare of 70 cents, and from the end of the Dewey Avenue feeder bus line to Grand View Beach for a one-way fare of 45 cents. Regular schedules are maintained from 7 in the morning to 10 in the evening, with additional service on Sundays and holidays. The bus system along the Lake Ontario shore is operated by the railways' subsidiary, the Rochester Railways Co-ordinated Bus Lines Inc.

With the purchase of the Ridge Road line from Buckley Brothers for $15,000, the last obstacle in the path of the bus system project was removed. The Ridge Road line was a bone of contention for months, as the Hilton Town Board refused to grant the railway a franchise in competition with the Buckleys and consequently held up the project until the purchase on May 26.

Pending the arrival of six Bender bodies from Cleveland, the company is using rolling stock it had on hand and the four White buses it acquired with the purchase of the Ridge Road line from Buckley Brothers. The service extends over 36 miles in all and in the main supplants the service given by the abandoned Rochester & Manitou Electric Railway. Transfers are issued to city trolley lines.

The Nueces Railway, Corpus Christi, Tex., recently received two Reo buses to be operated in supplementary service.

The Illinois Commerce Commission has authorized the East St. Louis & Suburban Railway to replace its Oakland Street car line in Belleville, Ill., with buses. The company has been using buses on the Oakland line for about a year. The bus service has proved so satisfactory to all concerned that it has been decided to go through with an agreement reached a year ago to dismantle the car line.

The Mid-State Coach Lines, the bus company operated by four Central New York trolley corporations, has opened service in Auburn to supplant the abandoned Seymour Street trolley line section and serving an area in West Auburn hitherto not directly reached by trolley lines. This line is one of several to be installed by the company to cover other sections of Auburn.

The Knoxville Power & Light Company, Knoxville, Tenn., is considering the use of buses to suburban districts.

Permission to establish a coach line to serve the south side in the Grant Park section of Atlanta, Ga., has just been granted the Georgia Railway & Power Company by the Atlanta City Council. The service will be similar to that established some months ago in the Morningside and Sylvan Hills sections not reached by street cars. Under the terms of the permit, a 10-cent fare will be charged for rides on coaches or combination rides on coaches and street cars. Transfers will be issued from bus to car and from car to bus, but in the latter instance must be accompanied by 3 cents, bringing the total up to 10 cents. The interchangeable fare arrangement is, however, only temporary and will in no way affect routes to be established later and which will extend to the center of the city.

The Board of Public Utility Commissioners has authorized the Ocean City Electric Railway to discontinue service on its crosstown line, Ocean City, N. J., and to substitute bus service thereon. Evidence indicated that the railway was financially unable to restore its track to proper operating condition.

The Durham Public Service Company, Durham, N. C., through R. L. Lindsey, vice-president, has laid before the City Council a proposal to motorize the entire Lakewood Park-Mangum Street line, one of the two main lines of the Durham system, serving all the northern and all the southwestern sections of the city. The Council has referred the matter to the utilities committee. Bus lines are already in operation in West Durham and over much of north central Durham and the Club Boulevard section. They are also being operated on the Chapel Hill Street section during the construction of the Chapel Hill Street underpass, which blocks railway traffic to that end of town.

The Syracuse Railway Co-ordinated Bus Lines, Inc., has applied to the Common Council of Syracuse, N. Y., for a bus permit to operate from Syracuse to Chittenango.

The Alexandria & Suburban Motor Vehicle Company, subsidiary of the Washington-Virginia Railway, Washington, D. C., has received provisional permission to operate buses in the District of Columbia over a specified route leading to Alexandria, Va. Interstate business only is allowed. The grant is not effective unless the Corporation Commission of Virginia issues a certificate for operation in that state.

The Union Traction Company of Indiana expects to ask for the abandonment of one city line in Marion, Ind., in favor of bus service. Officials contend the line does not pay and the company's finances are not in condition to permit it to make repairs.

The St. Louis Bus Company, controlled by the reorganization committee of the United Railways, St. Louis, Mo., has requested the St. Louis Board of Public Service to authorize a new bus line that will form a loop with five street car lines in the southwestern section of St. Louis. The permit, if granted, would enable the St. Louis Bus Company to operate in a territory that is now served exclusively by the People's Motorbus Company. Part of the route sought is over streets now used by the rival bus company. Transfer privileges will be granted between the cars and the new bus line. The People's Motorbus Company is expected to oppose this line vigorously.

Officials of the Waterloo, Cedar Falls & Northern Railway have noted that since the Rainbow Drive has been paved there has been an increase in the popularity of the buses between Waterloo and Cedar Falls, Iowa. So much are the buses favored that the railway plans to discontinue the half-hour service between the cities of Waterloo and Cedar Falls and operate only once an hour. It is the intention of the company to serve patrons between the two cities exclusively with buses after 7:15 p.m.

A petition of the Rockford & Interurban Railway for permission to operate interurban buses into Rockford, Ill., on North Second Street was presented recently to the City Council.

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Freight Delivery Planned in Eastern Massachusetts

The Boston & Worcester Street Railway is planning an extensive door freight delivery to cover practically every city and town in eastern Massachusetts. In Lowell, Lawrence, Andover, Haverhill and Boston the system was tried during 1924 and was reported favorably. It is planned to make door-to-door delivery along the entire system. Shipments west of Boston will be delivered to the exact address within 24 hours of their receipt at the forwarding station.

Election at Decatur Next Step

W. A. Baehr, president of the Illinois Power & Light Corporation, has approved the final draft of the railway franchise for Decatur, Ill. Nothing now remains but to pass the ordinance and call the necessary election for the approval of the voters. More than a month ago the Illinois Power & Light Corporation and the city reached an agreement on the terms. When the final agreement was reached several changes were incorporated in the final draft and were submitted to the Illinois Power & Light Corporation for final approval. The most important addition to the franchise, patterned after the old franchise which expired in 1921, is the section giving recognition to the bus. It provides that the company, with the sanction of the City Council, may substitute buses for street cars on any existing line for a period of six months, subject, at the conclusion of that time, to a vote of the people. The franchise is for twenty years.

Ten Cents in Plattsburgh

An order was issued by the Public Service Commission on June 5 authorizing the Plattsburgh Traction Company to increase its fare from 7 cents to 10 cents on one day's notice. Three tokens will be sold for 25 cents good within the city limits. It was shown at the hearing that the road had long been operated at a loss by the Delaware & Hudson Company and that it was bought in April by two Plattsburgh bankers to save it from being abandoned. It is estimated that the 10-cent fare will provide sufficient revenue approximately to meet expenses without paying any return on the investment.

St. Louis Promulgates Downtown Parking Rules

Downtown parking is prohibited in St. Louis, Mo., effective June 23, between 7 a.m. and 10 a.m. and 4 p.m. and 6 p.m. by an order issued by the Traffic Council on June 4. The ruling holds for 90 days, after which it must be adopted as an ordinance by the Board of Aldermen. All but commercial vehicles are affected, the limit for these being fifteen minutes. The Council also stipulated designated parking spaces for intercity bus lines. No other vehicles will be permitted in such spaces. The intercity buses will not be permitted to discharge or take on passengers in St. Louis except at the spaces named and at certain points.

News Notes

Ten-Cent Fares Continued. — An order was issued by the New York Public Service Commission on May 29 permitting the Westchester Street Railroad to continue in effect the present 10-cent fare schedule in each of the six zones until Dec. 1, 1925. The communities through which the company operates have consented to the continuation. The order affects the Tarrytown, Silver Lake, Scarsdale and Mamaroneck Avenue lines.

Third Arbiter Chosen.—Thomas J. Williams, a conciliator for the federal Department of Labor, was recently designated by Secretary of Labor Davis the third member of a wage arbitration board that will settle the differences between the Scranton Railway, Scranton, Pa., and its employees. Secretary Davis was asked to name the umpire on the wage arbitration board when representatives of the company and the union failed to come to an agreeable selection of a third man. The two other arbiters who will take part in this issue are John M. McCourt for the company and L. F. Hart for the men. At a special meeting of the union workers held a week ago the employees voted to prolong arbitration and continue at work. The union workers originally asked for a general increase of 16 cents an hour for all employees. If granted the 16-cent boost it would bring the hourly rate of motormen and conductors up to 80 cents. The wage contract expired on April 1.

Conference Considers Charges.—At the conclusion of a conference between city officials and officers of the Louisville Railway, Louisville, Ky., it was declared by the president of the Council that Louisville would continue to operate on a 6-cent fare. This apparently is the result of the conference called to discuss with officials the contents of a resolution passed by the General Council censuring railway officials for alleged extravagances in the management of the company. Everything contained in the report of the Utilities Bureau to the Board of Works was gone over at the conference. Others at the meeting would make no statement other than that nothing had been accomplished.

Passes for All Time.—The weekly pass has been adopted for use indefinitely by the Utah Light & Traction Company of Salt Lake City, Utah, after a trial period of several months.

Power Dispute Terminated.—The city of Toledo lost its final battle to collect alleged overcharges by the Toledo Edison Company for current used by the Community Traction Company in operation of railway lines in Toledo when the Supreme Court of Ohio, on June 3, sustained motions for the two companies to dismiss the appeal on error taken by the city attorneys. City officials, when W. E. Cann was street railway commissioner, claimed that the Toledo Edison Company had collected $300,000 too much in power charges. The question of the future rate is now before the Public Utilities Commission. Voluntary reductions in the power rate were made several months ago by the company so that the dispute is practically a closed incident. Action of the Supreme Court closed the courts as a means of determining power rates under the Milner service-at-cost ordinance.

New Routing in Pawtucket. — Pawtucket, R. I., recently installed a loop system whereby practically all cross-town lines have been eliminated by the United Electric Railways. With the start of the new routing the system of fare payment has been changed so that no fares are collected in the center of the city, inbound fares being taken as the passengers enter and outbound passengers paying as they leave the cars. This is expected to speed up car movement in the center of the city.

Contract Submitted. — Mayor Kendrick of Philadelphia, Pa., recently submitted to the Council with a message an ordinance authorizing the execution of a contract, the parties being the Philadelphia Rapid Transit Company, Philadelphia City Passenger Railway, West Philadelphia Passenger Railway, the Philadelphia Traction Company and the Union Traction Company. The new contract is supplemental to an agreement entered into on Feb. 2, 1925, between the city and the Philadelphia Rapid Transit Company for the leasing by the city to the Philadelphia Rapid Transit of a two-track surface car subway in Chestnut Street proposed to be constructed by the city.

Jitneys Must Cease.—By an act of the City Council of Savannah, Ga., the jitneys will pass out as a means of public transportation in that city on Oct. 1. The Savannah Electric & Power Company, which runs the railway in Savannah, said it would have to reduce service in Savannah and into the suburbs unless it was protected from unfair competition. Jitneys began running in Savannah six or seven years ago.

One Fare Zone Eliminated. — The Public Utilities Commission has granted the application of the Newport Electric Corporation, Newport, R. I., to create a neutral zone in Tiverton by which one fare zone will be eliminated between Tiverton and Fall River and the operation of trolleys, buses or both between Tiverton and Newport was approved. Some months ago the company was granted permission to substitute buses for trolleys between Newport and Tiverton during the period from Sept. 1 to June 1, continuing the electric railway from the Stone Bridge to Fall River. Now the company can run either trolley or buses as the traffic warrants.

Date for Trial Fixed.—The United States District Attorney at Buffalo has tentatively fixed June 22 as the date for the first of the series of trials of executives and members of the Amalgamated Association under indictment on charges of conspiracy in connection with the dynamite outrages on the Buffalo-Niagara Falls high-speed interurban line at Elwood during the strike of 1922. All of those indicted in the last report of the federal grand jury have been taken into custody.

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Financial and Corporate

Purchase Details Stated

Basis of Acquisition of Virginia Railway & Power Company by Stone & Webster Made Public

Frank J. Gould, until recently owner of the controlling interest in the Virginia Railway & Power Company, Richmond, Va., sold his holdings at a flat price of $100 a share for the preferred stock and $120 a share for the common. The agreement made at the time of the sale of the majority shares gave Richmond stockholders the privilege of disposing of their stock at the same price. A number of stockholders are said to have taken advantage of the offer, with the Virginia Trust Company, Richmond, as clearing agent. All stockholders who desire to sell have been asked to present their stock, signed and stamped ready for transfer.

The total stock held by Richmonders is said to be approximately $750,000 in common and $2,000,000 preferred. The outstanding capital stock of the company is $9,000,000 preferred and $12,000,000 common. Mr. Gould had owned the controlling interest since the organization of the present company in 1909.

The controlling interest was purchased by a syndicate composed of Stone & Webster, Inc., Chase Securities Corporation, Blair & Company, Inc., and Blodget & Company. The sale was brought to a successful close recently after Charles A. Stone had returned from Paris, where preliminary steps were arranged with Mr. Gould for the purchase of his interest. Several other Virginia properties have also been taken over by the syndicate.

The properties are located in a prosperous section of the Roanoke and Rapidan Valleys, where the company furnishes electric light, power and railway service to Richmond, Norfolk, Petersburg, Portsmouth and other communities, and does the entire gas business in Norfolk. There are five generating stations, including both steam and hydro-electric, with a capacity of 140,000 hp., and the company owns valuable undeveloped water-power sites on the Rapidan and Roanoke Rivers. The purchase also includes the Spotsylvania Power Company, which serves Fredericksburg and owns several valuable power sites on the Rappahannock River. The properties will be under the executive management of Stone & Webster, Inc.

Mr. Stone, in a statement made on June 8, said:

> It has been felt for some time that Mr. Gould might consider selling his interest in the Virginia public utilities, and we feel that we are very fortunate in successfully making the purchase. We are very glad to have the opportunity to assist in the development of this part of Virginia. The policy of the new owners will be to render first-class service, to co-operate fully with the customers, the general public and the authorities, and to provide extensions to the plants and other facilities as rapidly as is necessary to keep pace with the growth of the community served.

On June 10 the Virginia Railway & Power Company announced an issue of $2,660,000 first and refunding mortgage 5 per cent bonds, offered by Stone & Webster, Inc., Blodget & Company, and Blair & Company, Inc., together with $486,000 Virginia Railway & Power Company-Norfolk & Portsmouth Traction Company first mortgage 5 per cent bonds, both at 98½ and interest. These offerings are part of the issues now outstanding and do not represent new financing. Both issues are the direct obligation of the company.

Council's Offer for Rainier Line Submitted

A formal offer of $1,000,000 in utility bonds made by the City Council of Seattle, Wash., recently for the Seattle & Rainier Valley Railway has been transmitted to M. C. Sampsell, Chicago, president of the company. Walter M. Brown, resident manager at Seattle, states that should the city's offer be satisfactory the proposition will be submitted to the bondholders for ratification.

Following the action of the City Council in making the formal offer, opponents of the deal began to agitate a movement for a referendum. No definite steps will be taken, however, until the Council, by ordinance, shows it intends to complete the purchase.

The Rainier Valley line consists of about 25 miles of tracks and 32 cars. Originally, the company asked $1,500,000 for the system. The line is the only privately owned railway in the city, the major system having been purchased by the city in 1919 from the Stone & Webster interests of Boston for $15,000,000.

Baltimore Valuation Hearing Resumed June 16

Testimony in the hearing before the Maryland Public Service Commission to fix a valuation on the property of the United Railways & Electric Company, Baltimore, during last week was principally confined to the question of "going value." Witnesses for the railway, including heads of various departments, were called upon to substantiate the claim made by the company that the "going value" was $16,000,000.

Some testimony also was heard in regard to rerouting, but the commission held that the company would not be forced to make any extensive studies of this subject until after a fair valuation was determined. Joseph A. Stoll, superintendent of traffic, was one of the witnesses who testified as to rerouting. It is claimed by Clarence W. Miles, people's counsel, that rerouting would save considerable money.

Following the hearing held on June 5 the case was adjourned until June 16. At that time the United will present testimony in regard to the weekly pass. Mr. Miles petitioned the commission several days ago to order the company to show cause why it should not put this weekly ticket plan into operation.

Final Hearings Held

Minnesota Commission Expected Shortly to Announce Rates of Fare in Minneapolis and St. Paul

Rates of fare on the St. Paul City Railway and the Minneapolis Street Railway will be announced by the Minnesota Railroad and Warehouse Commission early in July. After a final hearing of one day the commission had the figures submitted by the railways to bring their valuations to date. Valuations already announced by the commission for the two properties were not of even or recent dates. The temporary rate of fare in both cities is 6 cents flat with universal transfer. Each company is asking a 7-cent fare. In case of disapproval by either the cities or the railways of the permanent rates made by the commission appeal is allowable to the district courts.

At the hearing the Minneapolis company held that its property had increased in value from Jan. 1, 1922, to Jan. 1, 1925, $1,832,867, bringing the total to $27,178,948. The city held the increase was only $306,554. The commission had fixed the valuation as of Jan. 1, 1922, at $25,346,081. The St. Paul company held its property had been increased in value $206,019 from the valuation of $15,998,849 as of Jan. 1, 1924, as fixed by the commission, or to a total of $16,204,868. The city put the increase at $167,650.

Permanent Fare Rate Agitated

For the first time since the rate hearings began two years ago the matter of permanent rate of fare was brought up at the hearing ended on June 2. D. J. Strouse, comptroller of the Twin City Rapid Transit Company, said that to earn 7.5 per cent on the valuation of $27,165,396, the expected rate of return to be announced by the commission, the company in Minneapolis will need a fare of 6.6 cents. To continue the improved service of 1925 the company will need 6.61 cents fare, and if it is to make improvements in 1925 of 4.86 per cent over the 1924 standard as required by the city ordinance of 1920 the fare must be 7.16 cents. The city maintained the company can show a profit at the present rate of fare.

In St. Paul a fare of 7.38 cents would be necessary to secure a return of 7½ per cent. Earnings in St. Paul have been decreasing. The city contends that if the amount claimed by the company for depreciation is reduced and cost of the valuation proceedings is spread over ten years the company will be able with a 7-cent fare to make extensions and lay pavements. The city wants the depreciation charge reduced from $350,000 to $150,000 and suggests the valuation expense of $300,000 be charged off at the rate of $30,000 a year.

The April report of the St. Paul City Railway shows a net loss of $15,987. For four months the operating income was $228,803, compared with $233,961 for the similar period in 1924. The passenger revenue declined from $421,594 in January to $353,292 in April, 1925. For the four months the company earned 4.2 per cent on the commission's valuation figure.

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Surplus in Omaha

Decrease in Number of Passengers and Passenger Revenue—Higher Fare Allowed

Passenger revenue of the Omaha & Council Bluffs Street Railway, Omaha, Neb., for the year 1924 compared with 1923 shows a decrease of $193,544, or 4.80 per cent. The decrease in number of passengers was porportionately greater, but the increased fare in Council Bluffs and on the bridge line, put into effect on Aug. 3, partly offset the diminished travel. The company attributes this falling off in travel to the increased use of automobiles. It says this was shown conclusively during the severe weather in December, 1924, when traffic increased over December, 1923.

Revenue from other operations shows an increase of $35,770 for the year, but non-operating revenue shows a falling off of $13,547.

Operating expenses decreased $191,113, or 6.16 per cent. Of this amount $47,500 represents a reduction in the sum set aside for depreciation. Approximately $20,000 represents a saving in the price paid for coal and a lessened consumption of power, and the remainder is due to smaller amounts expended for maintenance of cars, track and roadway, etc., and to a reduction in the car-miles operated. For injuries and damages a somewhat smaller sum was also required than for 1923.

Expenditures for renewals and replacements were rather large during the year. Expenditures for actual additions to the property on the contrary were small, but charges for betterments representing improved construction of replacements were considerable.

Expenditures for renewals and replacements of the leased lines in Council Bluffs were $243,463. The major charge to this account was that part for the reconstruction of the Missouri River bridge, which was in the nature of replacement rather than addition.

After a hearing before the Nebraska State Railway Commission on the company's request for a reconsideration of certain elements of value in the commission's valuation finding, the commission increased the value of the company's property in Nebraska for ratemaking purposes from $13,800,000 to $14,100,000. This does not purport to be the full value of the company's property, but is merely the value for ratemaking purposes. Other assets would bring the total value to a considerably higher figure.

In August the company increased the local fare in Council Bluffs from 5 cents to 7 cents cash or four tickets for 25 cents, after obtaining a temporary order in the United States District Court restraining the city of Council Bluffs from interfering with the raise in fare. At the same time the rate for a 30-ride commutation ticket between the two cities was increased from $1.50 to $2. The city of Council Bluffs has taken an appeal to the United States Circuit Court of Appeals. If this court sustains the lower court, the District Court will proceed to take evidence through a special master as to the value of the railway property in Council Bluffs, the revenues received and the operating expenses and determine whether the new rates of fare yield more than a reasonable rate of return on the fair value of the property used in giving service. The opinion expressed in the report was that on the merits of the case the rates would be sustained.

The Nebraska State Railway Commission has since authorized the company to advance its fare on the Omaha lines.

INCOME ACCOUNT OF THE OMAHA & COUNCIL BLUFFS STREET RAILWAY FOR THE YEAR ENDED DEC. 31, 1924

Revenue from transportation:		
Passenger revenue	$3,836,694	
Special car revenue	1,435	
Mail revenue	185	
Miscellaneous transportation revenue	4,114	
Total revenue from transportation		$3,842,428
Revenue from other railway operations		499,045
Gross railway operating revenues		$4,341,473
Railway operating expenses		2,913,817
Net operating revenue		$1,427,656
Taxes assignable to railway operations		446,395
Operating income		$981,261
Non-operating income:		
Net income from miscellaneous physical property	$859	
Income from funded securities	4,696	
Income from unfunded securities and accounts	16,466	
Miscellaneous income	872	
Total non-operating income		22,893
Gross income		$1,004,154
Deductions from gross income:		
Rent for leased roads	$60,500	
Rent for leased roads, interest on funded debt	90,400	
Miscellaneous taxes	7,990	
Interest on funded debt	469,390	
Miscellaneous debits	5,641	
Total deductions from gross income		$633,921
Net income		$370,233
Dividend on preferred stock—5 per cent	$200,000	
Profit and loss adjustment—credit	125,748	74,252
Surplus for the year		$295,982
Surplus Jan. 1, 1924		306,277
Surplus Dec. 31, 1924		$602,259

Value of Capital Traction Increased

As the result of a decision by Justice Adolph A. Hoehling of the District Supreme Court the valuation of the Capital Traction Company, Washington, D. C., will be increased from $17,500,000 to more than $28,000,000. The decision was handed down on June 8.

John H. Hanna, vice-president and general manager of the Capital Traction Company, said that the carfare would not be affected. Further, that while increasing the value would tend to make the company's rate of return much lower at the present fare, the company has no plans for seeking a change.

The addition made by Justice Hoehling was $5,150,000. This sum was claimed as an addition to valuation by the company as representing the franchise, good will and other intangible values involved in the purchase of the old Washington-Georgetown Street Railway. The commission had refused to allow it as part of the calculated value of the Capital Traction Company's property. The decision directed the commission and the company to submit to Justice Hoehling their respective calculations of the value of the physical plant of the corporation, using current prices instead of the prices at which the materials and services were paid for in its construction.

While Justice Hoehling was making his decision on June 8, the commission decided that $23,067,000 was its calculation of the value of the physical property in the light of present-day prices. The company has decided, it was reported, to name as its view of this value $25,700,000. Choosing between these two estimates, the court cannot fix the physical value at less than $23,000,000, but since Justice Hoehling has already decided to include the intangible values, the new valuation cannot be less than $28,000,000 and may be $30,700,000 if the judge uses the company's estimate instead of that of the commission. It is said that the commission will appeal from the ruling of Justice Hoehling, although no decision had been made as yet to do so.

Rumored Sale of Annapolis Road

Local investment bankers in Baltimore, Md., continue to watch with interest the movement of the securities of the Washington, Baltimore & Annapolis Railway. Bonds of the company have been in demand since talk was heard of a new deal, in which the electric road would be a conspicuous figure. At the present price the yield is attractive and in any new merger or other proposition, it is explained, the bonds would probably be allowed to run to maturity, as refinancing could hardly be accomplished on a more favorable basis than the present one.

In this connection reports still persist that a deal involving a change of control of the electric line may soon develop. The rumors have, however, been denied by officials of the railway, as well as of the Western Maryland Railroad and J. E. Aldred, chairman of the boards of the Consolidated Gas, Electric Light & Power Company of Baltimore and the Pennsylvania Water & Power Company.

The common stock of the company touched 12¼ on the Baltimore exchange a few days ago. This compares with 5⅞ a few weeks ago. Bidding for the shares was spirited, and it was reported that some sizable blocks changed hands. As on recent days, buying was chiefly for out-of-town account, although local operators continued to add to their holdings.

Sale of Indiana Line Ordered

Sale of the property of the Beech Grove Traction Company, operating between Beech Grove and Indianapolis, Ind., 4 miles, at a price of not less than $30,000 has been ordered by the judge of the Circuit Court in Indianapolis. The sale will be held on June 22. The property is to be sold as a whole and not in parcels. The Fletcher Savings & Trust Company was named receiver for the road in November, 1917. According to Donald S. Morris, trust officer of the company, the receiver has been compelled to advance money for rebuilding the line and supplying a number of new cars. Receivership liabilities now total $30,000. Approximately $100,000 in bonds is outstanding.

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Tax Appraisals Cut in Indiana

The State Tax Board of Indiana has just finished its work with interurban railways. An average of reductions shows 21.43 per cent less than for 1924. One of the members of the board said:

I doubt whether the interurban lines would sell today for the amount at which we have appraised them. In the last year several traction companies in the state have gone into the hands of receivers. A number of short-haul lines have been discontinued. Hardly any are paying dividends on stock. There is perhaps a single company in the state which is making any profit.

We could not set the valuation of these lines any lower and do justice to the taxpayers. It is to be hoped that regulation of bus lines under the new law and the continued efforts of interurban officials will result in interurban lines getting on their feet.

Net Income Falls Off.—The Eastern Massachusetts Street Railway, Boston, Mass., reports revenue for April of $752,929, against $805,699 during the corresponding month a year ago. The expenses were $586,452 in April of this year against $612,595 during April, 1924. The net income in April, 1925, was $58,559, against $79,123 a year ago.

Reorganization Seems Assured.—It is said that 85 per cent of the sinking fund bonds, 90 per cent of the 7 per cent notes and 66 per cent of the stock of the Denver Tramway, Denver, Col., have been deposited with the various protective committees and that it is almost sure an early announcement will be made that the tramway is out of the hands of a receiver and the new officers elected. Claude K. Boettcher, chairman of the joint reorganization committee, is in the East and upon his return a further statement may be forthcoming.

Deficit in Youngstown in April.—The Youngstown Municipal Railway, Youngstown, Ohio, in April showed a deficit of $7,859, the largest of any month thus far this year. The deficit represents the difference between expenditures of $175,867 and gross income of $168,008. Of the total income $126,962 was from street railways and $41,046 from buses. The report showed total mileage of 476,405, divided between cars, 331,276, and buses, 145,129. The total number of passengers carried on car and bus was 2,643,151. The present deficit in the stabilizing fund is $1,263,062.

Insulls Get Maine Property.—The Middle West Utilities, Chicago, Ill., an Insull corporation, has contracted for the purchase of the Central Maine Power Company, a consolidation of gas, electric and railway companies in Maine. The purchase will be through a $3,500,000 sale of common stock which will be delivered in Augusta, Me., about July 1, by Walter S. Wyman, an officer of the Maine corporation. The Insulls will pay about $140 a share. Included among the properties of the company are electric railways which operate 23.92 miles of track.

Reject Saltair Resort.—Members of the City Commission of Salt Lake City, Utah, recently forwarded to H. J. Grant, president of the Mormon Church, a letter declining the offer of the church to give Saltair Beach and the Garfield & Western Railroad to Salt Lake City. The commissioners expressed appreciation of the magnanimity of the church in offering the resort, but expressed regret that the city found itself facing financial difficulties which in the judgment of the commission would render it inadvisable for the city to undertake to take over and handle such a resort. The famous Saltair Resort is 15 miles west of Salt Lake City. Most of it was destroyed by fire on April 22. The property was offered to the city, with the idea of the city rebuilding the structure, which would have cost in the neighborhood of $250,000. An offer of $75,000 to the Mormon Church for the property was rejected.

131,200 More Shares of Public Service Common.—The Public Service Corporation of New Jersey, Newark, will shortly issue and sell to stockholders 131,200 additional no-par-value shares of common stock. Holders of the 8 per cent preferred, the 7 per cent preferred and the common will be entitled to subscribe to one share of the new stock for each 10 shares held at $62.50 a share. The privilege applies to stockholders of record of June 5, and subscriptions will be payable not later than Aug. 1.

Slight Increase in Income Available for Charges.—The Santa Barbara & Suburban Railway, Santa Barbara, Cal., reports to the Railroad Commission its 1924 operating revenue as $137,053 compared with $144,815 for 1923. The operating expenses, excluding taxes, for 1924 are reported as $103,755 and for 1923 as $113,382, leaving a net operating revenue of $33,298 for 1924 and $31,432 for 1923. During 1924 taxes charged to operation were $10,769 and for 1923 $10,485. Deducting the taxes leaves operating income of $22,528 for 1924 and $20,946 for 1923. Adding to the operating income the non-operating income of the company results in a gross corporate income available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus of $22,528 for 1924 and $20,951 for 1923.

Book Reviews

1924 Proceedings of National Association of Railroad and Utilities Commissioners

Two volumes in one, containing the proceedings of the thirty-sixth annual convention held in Phœnix, Ariz., Nov. 11 to 14, 1924, and the proceedings of the National Conference on Grade Crossings held in Chicago, April 30 and May 1, 1924. Published by the National Association of Railroad and Utilities Commissioners, J. B. Walker, secretary, 270 Madison Avenue, New York. $5.

By invitation, several representatives of the great public utilities of the country addressed the Phœnix convention. Among them were: H. C. Abell, president, and Alexander Forward, secretary-manager of the American Gas Association; William Sproule, president of the Southern Pacific Company; J. N. Shannahan, president, and J. P. Barnes, vice-president of the American Electric Railway Association; M. H. Aylesworth, executive manager of the National Electric Light Association; Carl D. Jackson, special counsel of the National Electric Light and American Gas Associations; Eugene S. Wilson, vice-president of the American Telephone & Telegraph Company; Fred B. MacKinnon, president of the United States Independent Telephone Association. The addresses of these leaders in their respective industries will be found in full in this volume.

The Phœnix convention adopted a series of resolutions bearing on the amendment of the transportation act of 1920, so as to define more clearly the powers of the states. The subject was also covered in the address of H. G. Taylor of Nebraska, the retiring president of the association. Both will be found in this volume.

In the 1924 volume also will be found an address on "The Labor Investment in the Railroads," by Donald R. Richberg of Chicago, counsel for the railroad brotherhoods, and an address by Dr. E. A. White, director of the committee on the relation of electricity to agriculture. Major Alexander Forward's address on the prospects of fuel scarcity contains some startling facts and predictions.

Other subjects covered are: Car Shortage Problem, Federal and State Regulation, Public Utilities under Regulation, Standardization of Accounts, Safety of Operation, Railroad Valuation, Express Companies, The Labor Investment in Railroads, Public Ownership and Operation, The Grade-Crossing Problem, Motor Vehicle Transportation, Amendment of Transportation Act, Rates and Service, Telephone Depreciation, Uniform Regulatory Laws, Fuel Resources Imperiled.

Electric Railway Practices in 1924

Summary of most significant features of presentations made by electric railways Aug. 15, 1924, to the Charles A. Coffin Foundation. Edited by Henry H. Norris for the Foundation. Published by the American Electric Railway Association, New York, 1925. 179 pages. Illustrated.

Nine electric railway companies made presentations of their practices for the Charles A. Coffin prize during 1924. These presentations have been digested in book form, so that those interested in the industry may easily obtain a summary of methods. The information has been grouped in nine chapters, each devoted to some subject related to electric railway practice, and the method followed by each company as described in its presentation is given in that chapter. The chapter headings follow: Tendencies in Rolling Stock Practice, Improving Service Quality and Quantity, Advertising the Service, Fostering Good Public Relations, Relations Between Management and Employees, Progress in Accident Mitigation, Cutting Construction and Maintenance Costs, Economical Administration and Financial Structure of Electric Railways.

The book is uniform in style with "Electric Railway Practices in 1923,"

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and is well illustrated. It should offer many helpful suggestions on modern methods which have proved successful on numerous electric railways.

Municipal Ownership

By Carl D. Thompson. Published by Thomas Y. Crowell, New York. 445 pages. $3.

Carl D. Thompson, the author, is secretary of the municipal ownership league of America. He has set out to survey publicly owned utilities and to forecast the future. His publisher says in the blurb on the book that the chief purpose is to present an impartial survey of what has actually been done in the field of public ownership of public utilities.

Of this book of 445 pages only 28 are devoted to municipal street railways. This seems in some respects disproportionate. The treatment is patchy rather than profound. The author says "we have in America not only numerous smaller cities owning and successfully operating municipal street railway car lines but three of our large cities." It is true that some of these cities have done well in running the roads, but whether they have been a success depends on what one means by success. Still, this is not an occasion to cavil. The book deserves the careful attention of all students of public utility problems.

To get back to the beginning, Mr. Thompson first discusses the "limitations of municipal ownership"—showing how it logically embraces basic industries only and not all utilities. Then comes a chapter on the "Extent, Growth and Success of Public Ownership." Under "Familiar Forms" are discussed schools, libraries, postal systems, etc. The question of the ownership of railroads, steamship lines and of means of communication next comes in for discussion. This is followed by "Mines and Mining," "Electric Light and Power," "Water Works," "Street Car Lines," "Gas Plants," and similar utilities. There are chapters on the Ontario Hydro-Electric System and Public Super-power, the latest development in the field of electric utilities; also sections on the Canadian Government Railway and the Alaskan Government Railroad. As is indicated previously, a final chapter is devoted to "Objections to Public Ownership," in which, by the question and answer method, the whole subject is reviewed and an effort is made to meet some of the objections often urged against municipal ownership.

Facts and Figures of the Automobile Industry

Published by the National Automobile Chamber of Commerce. 1925 edition. 96 pages.

This is the sixth annual edition of "Facts and Figures of the Automobile Industry." The book aims to compile in ready reference form the essential data on the status and development of motor transportation, including such topics as production, registration, railroad traffic, uses of motor cars, highways, legislative principles, trucks, bus and taxi statistics and the relationship of rail, water, electric and motor transportation.

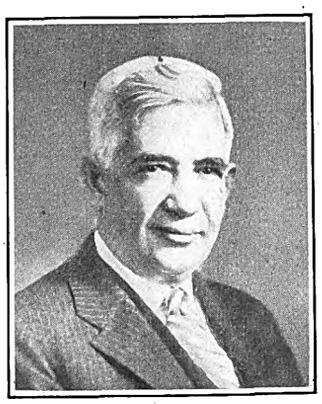
Personal Items

New Detroit Manager

Colonel Wallace, Successor to Ross Schram, Has Entered Upon His New Duties

Col. H. U. Wallace is the new general manager of the Detroit Department of Street Railways, Detroit, Mich., succeeding Ross Schram. Back of him is 30 years of engineering and railroading experience. He has expressed his determination to give the car riders in Detroit the best possible service as cheaply as possible, keeping in mind that it will be his bounden duty to protect and conserve the great investment which the people of Detroit have in the municipal street railway system.

Since January, 1924, he has been assistant general manager of the Knoxville Power & Light Company, with direction of all of that company's activities. He supervised the reorganization of the railway department of the company and is said to have put that department on a self-sustaining basis.



H. U. Wallace

During the war he was commissioned as Major of engineers and assigned to the construction division as supervising constructing officer of a large number of the most important ordnance plants. After the armistice, his rank having been raised to Lieutenant-Colonel, he had charge of dismantling all ordnance construction work and was discharged from the army on March 1, 1919. After being engaged with his father on water-power development in Georgia he became assistant general manager of the Arkansas Central Power Company in charge of operation.

Colonel Wallace was born in Rock Island, Ill., in 1872. He is the son of John Findley Wallace, chief engineer of the Panama Canal under President Roosevelt. He was graduated from Purdue University and in 1894 was engaged as assistant engineer for the Illinois Central Railway. During his years of service with that railroad, of which his father was general manager, he was resident engineer in charge of the Illinois Central's lake front improvements, roadmaster of the Chicago division, roadmaster and assistant superintendent of the Louisville division and superintendent of the Louisville and Freeport divisions.

From 1903 until 1906 he was chief engineer of the Illinois Central in charge of all maintenance and construction work. He resigned in 1906 to become third vice-president of J. G. White & Company, New York, in charge of construction work. He was later general manager of the Chicago, Lake Shore & South Bend Railway, which he operated for eighteen months. He resigned this position to go into business as consulting engineer in Chicago. His return to active railroading was as vice-president in charge of operation and reconstruction of the Fort Dodge, Des Moines & Southern Railway.

In 1912 Colonel Wallace inspected the holdings of the Northern Colorado Power Company. As a result of his work on this property and the recommendations he made a new company, the Western Light & Power Company, was organized.

F. W. Webster Made Vice-President

Frank W. Webster, general manager of the Stockton Electric Railroad, Stockton, Cal., has been promoted with the title of vice-president and general manager of the Fresno Traction Company, the Fresno City Railway, the Stockton Electric Railroad, and the Visalia Electric Railroad. The properties are all controlled by the Southern Pacific Company. For more than ten years Mr. Webster has been the general manager of all the electric lines in the San Joaquin Valley affiliated with the Southern Pacific.

D. H. Braymer in Consulting and Sales Field

Daniel H. Braymer has resigned as editorial director of *Industrial Engineer*, a McGraw-Hill publication, in order to devote the major part of his time to the activities of the recently organized D. H. Braymer Equipment Company. He will retain his connection with the McGraw-Hill Company as consulting editor of *Industrial Engineer*.

Mr. Braymer's newly organized company will have its headquarters in Omaha, Neb. It will specialize in consulting and sales work associated with power applications in industrial plants, large buildings and power plants and will act as the authorized representative of several manufacturers of related power equipment in Nebraska and Iowa.

The career of Mr. Braymer fits him admirably for his new occupation. He was born in New York State and completed his engineering education at Cornell University. In 1915 he became associated with the McGraw-Hill Company as engineering editor of the

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Electrical World and, with the exception of two years service as editor of the *Electrical Record*, he retained his association with the *Electrical World*, in later years as managing editor and co-editor. When the *Electrical Review* was purchased by the McGraw-Hill Company Mr. Braymer was placed in charge of both the publishing and editorial policies of its successor, the *Industrial Engineer*, with headquarters in Chicago.

Careers of Former Detroit Officials Reviewed

Ross Schram, succeeded as manager of the Department of Street Railways at Detroit, Mich., by Col. H. U. Wallace, was a former newspaper reporter selected as secretary by Mayor James Couzens in 1918. Prior to his connection with the street railway situation in Detroit Mr. Schram was engaged in publicity and advertising work for automobile companies. He also operated an automobile agency in Ottawa, Canada, but returned to Detroit in 1917 and again joined the Detroit *News* staff.

He obtained an intimate knowledge of the former Mayor's plans and policies during the municipal-ownership campaign. In addition to being secretary to the Mayor he was secretary to the first Street Railway Commission. After holding this position for several months he was made assistant general manager under Joseph S. Goodwin. Following Mr. Goodwin's death about two years ago, W. B. Mayo, chief engineer of the Ford Motor Company, was made general manager.

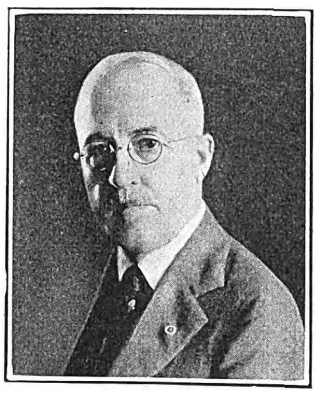
When Mr. Mayo resigned last June Mr. Schram was appointed general manager on Mr. Mayo's recommendation. At that time Mr. Mayo said that Mr. Schram's record entitled him to full credit and full responsibility. Not only that but the Street Railway Commission itself attributed much of the success that had attended the operation of the railway to the vigor and enthusiasm of Mr. Schram. He certainly possesses these attributes. They are essential to success in journalism, and Mr. Schram was a success at that, as was proved on many occasions in his handling of the work of the railway. At the time of his appointment to the post of manager last July Mr. Schram's career was reviewed at length in the ELECTRIC RAILWAY JOURNAL, special attention being given to his record with the railway. This sketch was accompanied by a portrait.

I. N. Merritt, former auditor of the Department of Street Railways at Detroit, began his career, strange as it may seem, in the shops of the Grand Trunk Railway in his home town, Battle Creek. It is said that after he had run a crane off the track he decided he was not fitted for a career in mechanics and so set off for college. After leaving college he went with the Burroughs Adding Machine Company in Detroit as cost accountant. In 1909 he returned to Battle Creek, where he assumed a position with the Grand Trunk System, but later in the same year he joined with several others and served as brakeman on the road for nine months.

In 1911 he went back to the Burroughs company, where he remained until 1914, when he accepted a position as cost man with the construction division of the Detroit United Railway, which was then operating the city railway lines now included in the municipal system. Mr. Merritt also was responsible for all building appraisal in connection with the Bemis appraisal work at Detroit. Feeling that he must know more about his chosen profession, accounting, he took up the study of commerce and finance at the University of Detroit, working during the day and attending class in the evening. Finishing his course in three years, he joined the firm of Thompson & Black, accountants, where he remained until 1920, when he joined the forces of the municipal railway. Mr. Merritt has been secretary of the Street Railway Commission as well as auditor of the D. S. R. He is only 34 years of age.

R. B. Campbell President Mid-West Association

At its recent meeting in Kansas City the Mid-West Electric Railway Association elected R. B. Campbell, secretary-treasurer and general manager of the Arkansas Valley Interurban Railway, president for the ensuing year.



R. B. Campbell

Mr. Campbell has been a member of the executive committee and vice-president of the association. His election as president marks another step in the progress of a career in the electric railway industry which began when the Arkansas Valley Construction Company was organized in 1909 to build the Arkansas Valley Interurban Railway. Mr. Campbell was first secretary and later became general manager of the railway.

Mr. Campbell is a native of Illinois, but has lived in Kansas most of his life. He was educated in Wichita, and his early experience was gained in the cattle business in which he was engaged for about fifteen years. Later he served in the Kansas Legislature as a representative from Mead County from 1902 to 1905. He also served two terms as City Commissioner of Wichita, from 1911 to 1915.

When the first unit of the Arkansas Valley Interurban Railway was completed in 1911, Mr. Campbell, as its secretary, got his first railway operating experience. In 1916 the construction was completed, and upon dissolution of the construction company, he remained in the railway field as secretary, treasurer and general manager of the interurban.

When the bus began to attract interest, Mr. Campbell saw the importance of linking it up in a constructive way with existing railway lines, and in December, 1924, organized the Arkansas Valley Transportation Company, of which he is president, to operate buses in the territory contributory to the Arkansas Valley Interurban Railway.

He has been active during the past year as a member of the legislative committee of the Mid-West Electric Railway Association, in which capacity he was instrumental in getting a bus regulatory law passed by the State Legislature during the last session.

George D. Fearman, formerly assistant secretary of the Dominion Power & Transmission Company, Hamilton, Ont., has been appointed secretary. In this new capacity he succeeds the late William Clarke Hawkins, who was also managing director.

J. R. Biedinger has tendered his resignation as structural engineer of the Rapid Transit Commission of Cincinnati, Ohio. Mr. Biedinger is considered one of the most valuable of the corps of engineers who have been employed by the transit commission. His resignation was the result of a desire to go nto private practice.

William Chamberlain, general manager of Oldham Corporation Tramways, has been appointed general manager of Leeds City Tramways, Leeds, England, succeeding the late J. B. Hamilton.

E. B. Kessler has succeeded Ralph Peters as superintendent of the Long Island Railroad. In the issue of the ELECTRIC RAILWAY JOURNAL for May 16 it was inadvertently stated that Mr. Kessler would succeed Mr. Peters as president.

Albert Collier has resigned as secretary of the Georgia Public Service Commission. He had served that body for about seven years. No successor has yet been named to fill the vacancy.

John H. Porter is to be appointed by Governor Baker of Missouri a member of the Missouri Public Service Commission to succeed E. J. Bean of De Soto, Mo. The Governor recently made an announcement to this effect. Mr. Porter is a civil engineer and was graduated from the University of Georgia. During the World War he served in the Engineering Corps.

Richard W. Martin, Pittsburgh City Solicitor, was recently appointed by Governor Pinchot the seventh member of the Pennsylvania Public Service Commission. Mr. Martin was named to the vacancy on the commission caused by the failure to confirm the nomination of Commissioner Fred J. Miller, Center Bridge, Bucks County. If confirmed by the next Senate Mr. Martin would hold office until July 1, 1933. Mr. Martin was graduated from the University of Pittsburgh in the law department; he was admitted to the bar and became affiliated with John S. Weller, then a State Senator. Later

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he became active in Republican party politics in Pittsburgh.

Major G. H. Simpson, until recently director of public relations of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., has resigned to accept a position with a Chicago advertising concern. Major Simpson became director of public relations for the railway in December, 1923. He founded the *Rylite Employees' News,* which has been issued for fourteen consecutive months.

Obituary

D. W. Ross

David William Ross, president of the United Collieries Company, formerly vice-president and purchasing agent of the Interborough Rapid Transit Company, New York, died on June 10. Mr. Ross was born at Mineral Point, Wis., 55 years ago. He entered the service of the Illinois Central Railway at the age of nineteen, remaining there for seventeen years. The last year he was general superintendent of transportation. He had long been associated with Theodore P. Shonts in railroad work. They worked together on the Panama Canal. When Mr. Shonts became president of the Interborough he invited Mr. Ross to join him. After leaving the Panama Canal Commission Mr. Ross served for a year as managing director of the Magnus Metal Company, New York, and then became vice-president of the Interborough Rapid Transit Company, the Interborough-Metropolitan Company, the Rapid Transit Subway Construction Company and a director in the New York & Queens County Railway. He later became vice-president of the New York Railways Company. He continued with the Interborough interests until the early part of 1920.

William E. Dowdell, for the past ten years superintendent of the Portsmouth Electric Railway, Portsmouth, N. H., a subsidiary of the Boston & Maine Railroad, died on June 5 at the Relief Hospital, Boston. Prior to his being appointed general superintendent he was assistant general superintendent of the line which operates from Portsmouth, Rye and North Hampton. Mr. Dowdell spent his early years on the sea, in which service he rose to a captaincy. Later he was employed by the Bay State Street Railway, going to Portsmouth in 1915 to succeed F. P. Fosgate.

William Clark Hawkins, secretary, managing director and chief engineer of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., died suddenly on May 11. In 1912 when Mr. Hawkins was general manager of the Dominion Power & Transmission Company he was elected managing director. In 1917 he was elected president of the Southern Canada Power Company. The Dominion Power & Transmission Company controls among other properties the Hamilton Street Railway, and the Hamilton Radial Electric Railway. In the old cable car days Mr. Hawkins was assistant engineer on the Third Avenue Road, New York.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Rules to Govern Purchases

At the convention of the National Association of Purchasing Agents, held in Milwaukee May 25-28, some recommendations were drafted as to the principles and plans of purchasing for state, county and municipal governments. The following procedures, taken from these recommendations, apply to purchases by corporations where there is a regularly organized purchasing department and will be of interest to utility purchasing agents:

1. Purchase requisitions covering materials or supplies not obtainable from any point from regular stock supply, properly approved by department head and covering complete description of material and specifications, are to be forwarded to the purchasing agent. These requisitions should describe but one class of material in accordance with storekeeper's standard classification, and should state whether funds are available in the budget to cover value of recommended purchase. Requisitions for replenishing stock items or additions to stock supply shall be sent by the storekeeper to the purchasing agent.
2. The purchasing agent is to obtain prices and close to the best advantage for material covered by requisition.
3. Orders should be written in four copies, the vendor receiving the original, the purchasing agent retaining the duplicate, the triplicate to be sent to the receiving or using department, the quadruplicate to the testing department.
4. Invoices are to be checked against order in the purchasing agent's office as to quantities, prices, f.o.b. freight allowance, terms, etc., and a record taken of the invoice.
5. The general storekeeper shall render to the purchasing agent each day a tally sheet itemizing quantities and description of items received, giving vendor's name, purchasing agent's order number and disposition.
6. Invoices, properly approved by the purchasing agent, should then be passed to the proper fiscal officer for payment, record having first been made of the date that each invoice was passed before expiration of discount period.
7. A suitable record indexed according to materials should be kept showing dates and quantities purchased as well as the price and discount.
8. The purchasing agent shall govern the sale of any and all scrap and surplus materials. A list of scrap and surplus materials should be submitted by the storekeeper.

Ohio Brass to Split Shares

Stockholders of the Ohio Brass Company, Mansfield, Ohio, have been asked to approve a split-up of present stock, two for one, exchange to be made with new no par common. The company has paid dividends on the common stock for 21 of the last 23 years without interruption. Net earnings for the three years ended Dec. 31, 1924, it was announced, averaged $6.49 a share on the company's no par value common stock to be outstanding after the proposed stock dividend.

The company has only $2,100,000 of preferred stock outstanding. It has no funded debt.

Bureau of Mines Transferred to Department of Commerce

President Coolidge by executive order on June 4 transferred the Bureau of Mines from the Department of the Interior to the Department of Commerce.

Two offices of the Bureau of Mines will remain under the Interior Department, those having to do with coal, oil and other mineral land leasing.

Secretary Hoover said that the Bureau of Mines was created as a service bureau for the mining industry and that it was his purpose to develop its activities. He said that he would soon appoint a committee representative of organizations of mining engineers and the mining industry to study ways and means to increase the efficiency of the Bureau of Mines and divisions of the Department of Commerce which do work of similar character.

In furtherance of the same purpose to combine all government business agencies under one head, the president some months ago transferred the Patent Office to Secretary Hoover's department, and other bureaus will be similarly treated when the required legislation is obtained under the reorganization act.

Complete Trade Statistics Make for Competition

As more opportunity is afforded for study of the Supreme Court's decision in the matter of trade statistics a very general conclusion is being reached that it is one of the finest definitions of law

Metal, Coal and Material Prices

Metals—New York	June 9, 1925
Copper, electrolytic, cents per lb.	13.50
Copper wire base, cents per lb.	15 875
Lead, cents per lb.	8 40
Zinc, cents per lb.	7.34
Tin, Straits, cents per lb.	55 50
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2 125
Central, Ill., screenings, Chicago, net tons	1.775
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6 25
Weatherproof wire base, N.Y., cents per lb.	17.85
Cement, Chicago net prices, without bags	2 20
Linseed oil (5-lb. lots), N. Y., per gal.	$1.09
White lead in oil (100-lb. keg), N. Y., cents per lb., carloadlots	0 1575
Turpentine (bbl. lots), N. Y., per gal.	$1 01

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in relation to economics that ever has been handed down by the judiciary. The court is as emphatic in its pronouncements against conspiracies to fix prices or to limit distribution as it is in pointing out that a statistic service is not such a conspiracy. The recent ruling claiming that trade statistics are not illegal was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of June 6, page 913.

One of the dangers of a decisive victory of this character, it is pointed out, is the encouragement it will give trade associations that are disposed to edge over the line. It is clear that the court regards secret statistics as being over the line. If the 95 per cent who never have made improper use of statistics are not to suffer again from the wrongdoing of a few, they should do all within their power to discourage any misuse of the function which has been stripped of uncertainty. The discussion of this subject for the past several years has had the effect of focusing public attention on these activities. Publication of all statistics is believed to constitute the greatest safeguard that can be set up.

The position of the court is regarded as a striking substantiation of the position taken three years ago. At that time Secretary Hoover, through a letter written to the Attorney-General, gave the country a comprehensive set of arguments showing that it was neither sound nor warranted to deny industry a statistical service. The Department of Commerce, in addition, took the position that complete statistics of prices of past transactions make for competition.

Exhibit Applicants for A.E.R.A. Convention Increase

Space applications for the October convention of the American Electric Railway Association have been out ten days. Up to the close of business June 10, 77 companies had applied for 42,743 sq.ft. of space. For the same period last year 45 companies had applied for 26,254 sq.ft. A little better than two weeks still remains in which to file applications so as to have them considered by the exhibit committee when it meets on July 1 to make the official space assignment. Application for space can be made to Fred Dell, director of exhibits, at association headquarters, 292 Madison Avenue, New York City.

Rolling Stock

Kansas City Railways, Kansas City, Mo., through Receivers Wilson and Fleming, awarded the contract for 25 single-deck, six-cylinder, 29-passenger buses to the Yellow Coach Company, Chicago, on June 10. Chassis for eighteen double-deck buses and five parlor buses were ordered from the Six Wheel Safeway Manufacturing Company, Philadelphia. All double-deck buses are to be delivered in St. Louis within 42 days and parlor cars within 49 days. All bodies will be built by one of two car companies in St. Louis, according to special designs of the Kansas City Railways. Single-deckers will have 230 in. wheelbase, air-operated front and rear doors and air brakes.

Track and Line

Northern Ohio Traction & Light Company, Akron, Ohio, will spend more than $1,000,000 in railway betterments. About 40,000 new ties are being placed on various sections. Extensive repair work is being done in Akron. The cost of building new track on four streets will be $300,000. Other repair work includes the double tracking of High Street in Barberton at a cost of $125,000. Improvements at Meyers Lake Park total $35,000. New tracks in Canton will cost about $150,000, with the double track between Canton and Massillon, practically completed last year, costing $28,000. In the city of New Philadelphia worn-out tracks are being removed and up-to-date tracks placed on steel ties and concrete construction are being substituted. The total cost of this improvement is $50,000. The sum of $7,500 is being spent in the raising of 2 miles of track between Midvale and Uhrichsville. Contemplated new tracks between Bedford and the city limits of Cleveland will cost $300,000.

Iowa Railway & Light Company, Cedar Rapids, Iowa, will pave between the car tracks at Third and Main Streets in Marshalltown, using Lumnite cement. This experiment in concrete paving will be watched with interest by the city administration.

Seattle, Wash. — The utilities committee of the City Council has approved an ordinance authorizing the extension of the Cowen Park line of the Seattle Municipal system from Ravenna Boulevard and Fifteenth Avenue northeast to the Bothell Road. The project will be financed by the sale of $72,000 interest-bearing railway warrants.

Municipal Railway of San Francisco, San Francisco, Cal., is extending its line into the Spring Valley Water Company property and the Ocean View tract by way of Junipero Serra Boulevard. The cost of this work will probably reach $265,000. The Spring Valley right-of-way is about 7,000 ft. long. It was donated to the city for the car line.

Nashville Railway & Light Company, Nashville, Tenn., will spend about $53,000 to reconstruct its tracks and pave between and for 2 ft. on each side of its double tracks on Fatherland Street from Second Street to Eleventh Street.

Power Houses, Shops and Buildings

San Francisco Municipal Railway, San Francisco, Cal., will have a new carhouse and shop at Bryant and Mariposa Streets, following the voting by the Board of Supervisors of $70,000 for the purchase of this block of land. The question has been under debate for one and a half years.

Key System Transit Company, Oakland, Cal., will spend about $300,000 in rehabilitating its power system in the East Bay cities of California. Work already started has for its object practically a complete revision and modernization of the method of carrying power from substations to the cars. The new power distributing system will not only take care of the normal increase in business, but will also make it possible to have ample power at full voltage applied to car motors, thus providing for quicker acceleration, faster schedule speed and consequent better service. The new Hobart unit will cost approximately $24,000.

Public Service Railway, Newark, N. J., recently received permission to construct a commercial garage at 222-38 Bloomfield Avenue, to house about 140 buses, and to cost approximately $150,000. This location was for many years the site of a carhouse built in horse car days. It is now occupied by an open store yard for cars and a small repair shop. The garage will be of modern construction and will be the headquarters of the Bloomfield, North Newark, Summer Avenue and Market line buses. Objections to the garage were overruled by the zoning commission, which held that the change would be an improvement and would tend to increase rather than depreciate property values in that section.

Trade Notes

Morton Manufacturing Company, Chicago, Ill., announces the appointment of the Peden Iron & Steel Company with offices in Houston and San Antonio, Tex., as its exclusive and direct representative covering the sale of its "Acme" line of railway appliances in the extreme southwestern section of the United States and Mexico.

American Appraisal Company, Milwaukee, Wis., has recently opened offices in Dallas, Tex., 612 Mercantile Bank Building, and in Kansas City, Mo., Pioneer Trust Building. L. B. Jones is in charge of the Dallas office and John F. Wood of the Kansas City office.

George A. Muir, who has been connected with the Denver office of the Allis-Chalmers Manufacturing Company for the last five years, and for ten years previous to that with the machinery department of the Mine & Smelter Supply Company, Denver, has been elected to the office of president and manager of the Advance Machinery & Supply Company, Railroad Building, Denver, Col., which manufactures the Advance patented mechanical stoker and the Advance soot blower.

New Advertising Literature

Crouse-Hinds Company, Syracuse, N. Y., has issued Bulletin No. 214, on electric flashing beacons and automatic isolated traffic signals.

English Electric Company, Ltd., London, has issued an illustrated booklet descriptive of various types of electric locomotives manufactured by it. For the most part these machines are designed for operation by direct current at 1,500 volts. The control is of the all-electric type. The company's well-known camshaft controller is a feature of the locomotives.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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You Cannot Get Something for Nothing

LIKE the impossible theory of perpetual motion, the idea of "getting something for nothing" still persists. The delusion is fondly cherished by some railway men that the company can have certain odd jobs done in its shops "without costing anything."

It cannot be done. No matter how simple the job, it will cost something. Maybe it is only the building of a filing cabinet or the refinishing of the office furniture. Nevertheless the time of the shopmen and the material used in the work have a definite money value. Of course these items can be charged off to some other account, and the odd job can thus be made to appear to have cost nothing. Such procedure, however, is merely a subterfuge and in the final analysis an actual expenditure has been made.

Very often small construction or repair jobs can be done more cheaply in the railway shop than they could be done outside. But that is a very different matter from having them done "for nothing." If careful study of costs shows that money can be saved by doing certain work in the shop, well and good. This is not always the case by any means, and it is a mistake to think that a home-made product is invariably a sound economy.

Keeping Car Lines Clear During Track Reconstruction

REBUILDING or extensive repair of city railway tracks ordinarily requires the transport of large quantities of material. The old rails, ties, ballast and paving must be removed and new materials must be hauled in to replace them. The time-honored custom has been to carry all this material in railway cars.

Unless special equipment is used which is designed for the purpose and can operate at an average speed as high as that of the passenger cars, there is always danger that movements of this sort may cause delay to the company's schedules on routes over which the work cars must pass. Heavy equipment, such as steam or electric shovels and concrete mixers can, however, be moved over the rails at night without the same chance of delay. Once on the job, it remains there until the work is completed.

The practice adopted by the Pittsburgh Railways in its recent track reconstruction work is to haul all loose materials by motor truck, as described in an article in this issue. By this means it is possible to keep the tracks clear, so that there is no possibility of interference with schedules. Furthermore, it may be practicable to select routes that are more direct than the street car routes can possibly be, as the latter are laid out solely for passenger service. In some cases supplies can be obtained from sources not on the rail lines, and excavated material can be disposed of in places likewise inaccessible.

As to the relative cost of work cars or motor trucks, much depends on the conditions surrounding each piece of work. Even in a single city there may be wide differences in the various districts. The use of motor trucks for haulage of track materials does have possibilities. It is well worth investigating in any particular case.

Putting Truck Repairs on a Manufacturing Basis

USUALLY the method of making truck repairs in electric railway shops is to withdraw cars from service after the morning peak, do the overhauling during the day and then return the cars to service for the evening rush period. In most cases the car bodies are jacked up or lifted from the trucks and remain on supports while the truck overhauling is being done. Where general overhauling of other equipment, painting of car bodies, etc., are carried out at the same time as truck overhauling, some railways place dummy trucks under the car bodies so that they can be shifted from one department to another, the original trucks after overhauling being again installed when the car is ready for service.

The methods used by the New York Rapid Transit Corporation, which are described elsewhere in this issue, differ quite radically from the usual procedure, in that trucks are changed from one car body to another and those released from cars in the shop for general overhauling are used as spares for emergency repairs and general truck overhauling. This method makes it possible for truck work to be carried on continuously without regard to the time that cars are released from service. Shop forces can be organized along the most effective lines and the work can be done in the most convenient manner. Cars with trucks requiring repairs are not withheld from service over extended periods, but can be brought into the shop, have their trucks removed and replaced by others, after which they can be returned to service without delay.

This method is made possible in Brooklyn principally because the 800 subway motor cars operated have the same type of truck. The arrangement of truck equipment divides these into four classes, but this does not affect the general overhauling plan that is used. Probably few railways have the opportunity to carry out truck repairs on such a large scale as is necessary in Brooklyn, but the method used there with such beneficial results emphasizes the value of standardization, or at least uniformity, of such equipment on an individual railway. Roads that have from 100 to 500 cars in operation with the same or similar types of trucks are fairly

This is the issue in June that is devoted essentially to maintenance subjects

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numerous. Such railways could use the plan of continuous truck overhauling to advantage.

Truck maintenance is one of the big problems of car equipment departments. The truck frame supports the car body with its load, transmits the starting torque of the motors, and receives the braking forces. Its members are thus subjected to varying stresses large in amount, so that wear is rapid and repairs are needed more frequently than with other parts of car equipment. Any method that will permit of more thorough truck repairs and at the same time reduce their cost should prove of particular benefit.

Entering the Coffin Competition Aids the Individual Company and the Industry

BRIEFS submitted by electric railways in competition for the 1925 Coffin Prize must be ready by Aug. 1, a half month earlier than last year. There is still ample time, but none too much, for preparation. The upward turn in the affairs of many companies, as well as their recent splendid accomplishments under differing conditions, should act as an incentive to their interest in this year's competition.

Aside from the laudable desire to capture the honor of this award, with the accompanying prestige, there are secondary incentives of almost equal potency. The inevitable results of the intimate study of its own equipment and methods which a company must make in preparing its presentation are in themselves worth the effort. As item after item is compared with standard practice to determine its fitness for inclusion, the railway management becomes more and more conversant with its local problems. There is a further appeal in this competition through the desire to contribute to the standing of the industry in the opinion of the public. The award is given wide publicity; it is a matter of general news interest. By entering the competition and having their accomplishments advertised to the public progressive railways add materially to the prestige of the industry.

Educational Work Must Be Continued After Graduation

JUNE is the month of school and college commencements. They are properly so called because they mark the threshold of a new phase of life for each graduate. He has done well in finishing the course of study in which he was engaged. He has learned certain principles. But if he enters industry he will find that from the producing standpoint the most important things are still to be learned. In fact, learning them is a continuous process; they are never completely learned.

Many of the 1925 graduates will choose electric railway work for their careers. What is the electric railway going to do to help them learn the transportation business? What is it doing for their predecessors? The answer depends upon the characteristics of the property with which they cast their lots. An increasing number of railways are coming to realize the desirability of furnishing educational opportunities to their employees. It is a paying proposition.

While a spirit of paternalism on the part of an employer is to be avoided, it is possible to conduct educational and other activities without it, if they are frankly intended to render employees more efficient. This applies even to cultural studies that have no direct bearing on the work in hand. It is truer today, perhaps, than ever before that "man shall not live by bread alone." Any study, whether vocational or cultural, will produce a more intelligent employee. Is yours one of the properties where ambitious employees are encouraged and assisted to become more effective through study?

Boston's Case for Arbitration of Arbitration Procedure

EVERY ONE is interested in the amount he pays for fare, but the public of Greater Boston has a peculiarly close interest in the matter. If need be, it makes up the difference between the income of the Boston Elevated Railway and its outgo by any assessment which it stands itself. The company wants to pay wages that reflect full recognition for the work which the men do, but it does not want to pay more than that.

The situation is peculiar. Each time the company has been able to look ahead toward operating at a profit a wage award has come along and offset much of the good work done by the management. It reflects in no way on the personnel of arbitration boards of the past to say that arbitration has been a sad process—sad for the company and sad for the public.

Only a year ago the railway was required to increase the wages of its men 2½ cents an hour. The men had asked 20 cents more. Back wages to the amount of $175,000 had to be made up. The scale then decided upon was 72½ cents maximum for two-man car operators and 80½ cents for one-man. As a result it was necessary on the so-called community lines to put the fares up from 5 cents to 6 cents. The year before the men got an increase of 15 per cent.

The company now has no way to turn. It has about exhausted the limits to which operating economies can be carried. Due to his excellent work, General Manager Dana expects to come out even for the fiscal year ending this month. Excess of receipts over cost of service for four months ended April 30 was $730,425, against $237,188 in the same period of 1924. This is a remarkable showing. It means little to the public, however, if the men are to be allowed to undo the good work by carrying off all the savings. This they are attempting to do again.

The method of arbitration used in the past is one that the management inherited. Under conditions of private operation it was the generally accepted form, but with the interest of the community in the outcome enhanced materially the trustees say a form of arbitration more nearly in keeping with the present requirements should be perfected. All the company seeks is a representative on the board who may be expected to reflect the attitude of the public more determinedly. It has suggested that the plan of each side appointing an arbitrator be continued, but that instead of these two selecting the third member the Governor be designated to name the third man. As the trustees see it there is explicit authority to submit this very question to arbitration. The employees, on the other hand, contend that the method followed in previous cases is unalterable. Meanwhile each side is marshaling the facts regarded by it as essential to the success of its case in the present impending arbitration. The great difference in point of view appears to be that the trustees are conscious of the need to guard carefully other people's money, so called, while the men appear to be interested chiefly in converting this commodity to their own selfish end.

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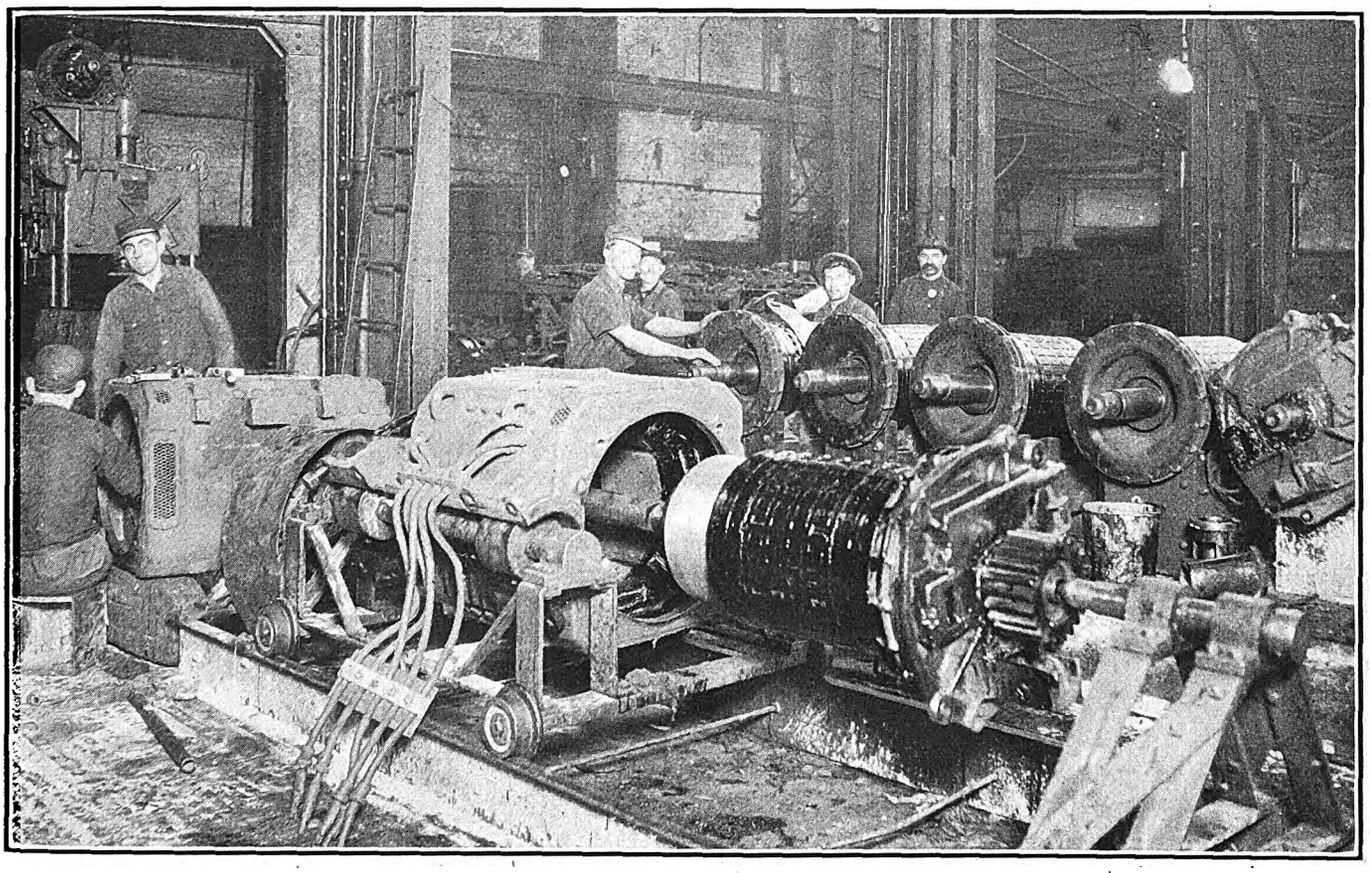
Truck Overhauling Made a Continuous Performance

Trucks Removed from Cars Are Replaced with Repaired Trucks Immediately so that Cars Are Not Withheld from Service for Truck Repairs—Spare Trucks for This Work Are Obtained from Cars in for Overhauling—Additional Facilities Provided for Truck Repair Work



Installing an Armature from a Box Frame Motor in the Motor-Overhauling Section of the 36th Street Repair and Inspection Shop, Brooklyn

EXPANSION of shop overhauling facilities of the New York Rapid Transit Corporation, which operates the elevated and subway lines of the Brooklyn-Manhattan Transit Corporation, was made necessary by the large increase in the number of cars operated. For truck repair work an addition has been built at the 36th Street repair and inspection shop in Brooklyn and is now in operation. The previous truck overhauling facilities at the shop have also been remodeled and combined so that a floor space of approximately 165 ft. x 18 ft. is available for truck overhauling of subway cars. The addition is of brick on a reinforced-concrete foundation and with concrete floors. At one side of the building a floor space of approximately 100 ft. x 18 ft. is used for washroom, toilet room, locker room and switchboard room. Approximately half of this is new construction.

The height of the new overhauling section is 30 ft. This gives ample headroom for traveling cranes, two of which serve the new overhauling section and travel the full length of the building. The remodeled overhauling section of the shop is also served by two overhead traveling cranes, but these run side by side instead of spanning the entire width as in the newly constructed portion. All cranes are of 15-ton capacity and were furnished by Alfred Box & Company, Inc., Philadelphia, Pa.

There are two tracks in the new truck overhauling section. One runs approximately one-half the length of the extension, starting at a drop pit in the front end of the building used for the removal of trucks from cars. This track is used for trucks previous to and after they are overhauled and for wheels required for replacement. A second track 100 ft. long extending into the front end of the building is used for supply cars. By this means they can be unloaded or loaded with wheels directly by the overhead traveling cranes.

For removing trucks from car bodies there is a Watson-Stillman 50-ton motor-driven pit jack operating in conjunction with a special crane furnished by the Detroit Hoist & Machine Company. The new shop is adjacent to the old inspection shop. This has made it possible to use the track nearest the new overhauling section for the removal of trucks and they are trans-

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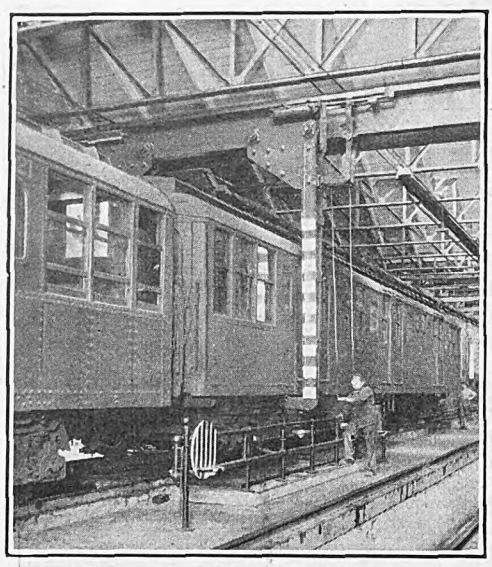
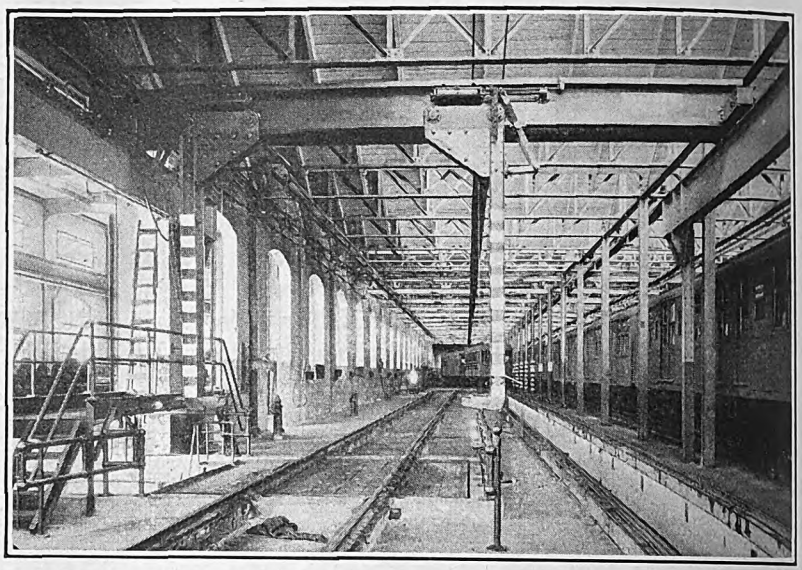
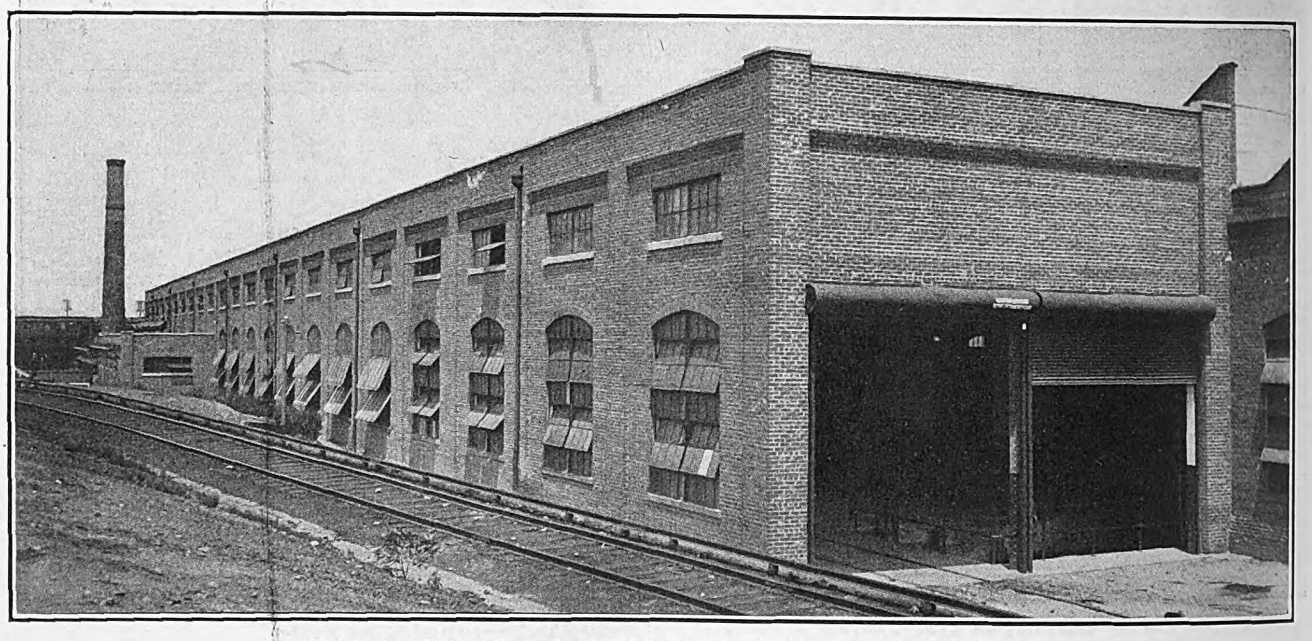
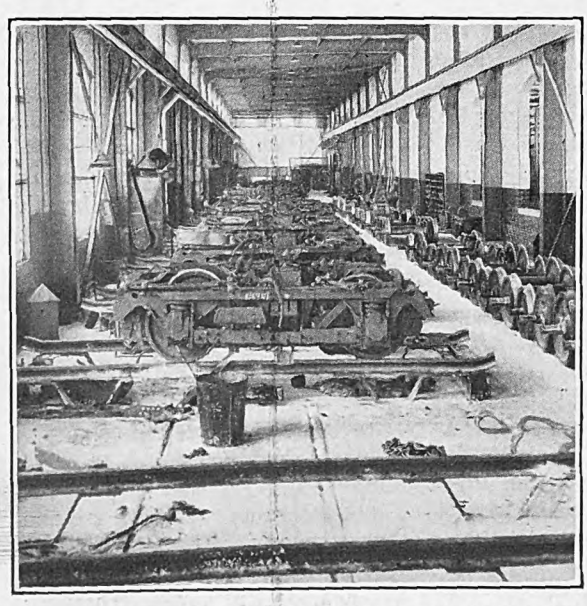


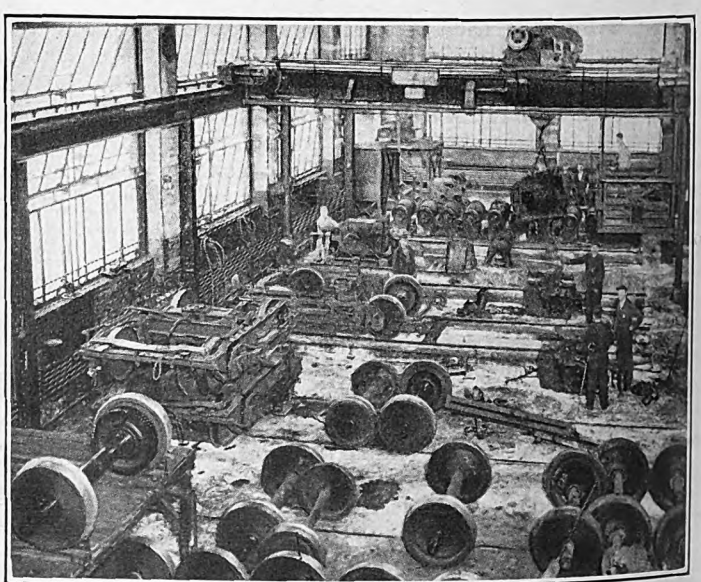


At Left—Train in Position for Removal of Truck. Overhead Crane Is Supporting Car Body. At Right—L-Shaped Hooks of an Overhead Crane that Support the Car Body During Truck Removal



The New Addition Is Built of Brick with Steel Rolling Doors at Entrance





At Left—A Row of Truck-Overhauling Stands Occupies the Space at One Side of the New Addition. The Other Side Is Used for Wheels and Trucks. At Right—Wheel Repair and Motor-Overhauling Section of the Shop

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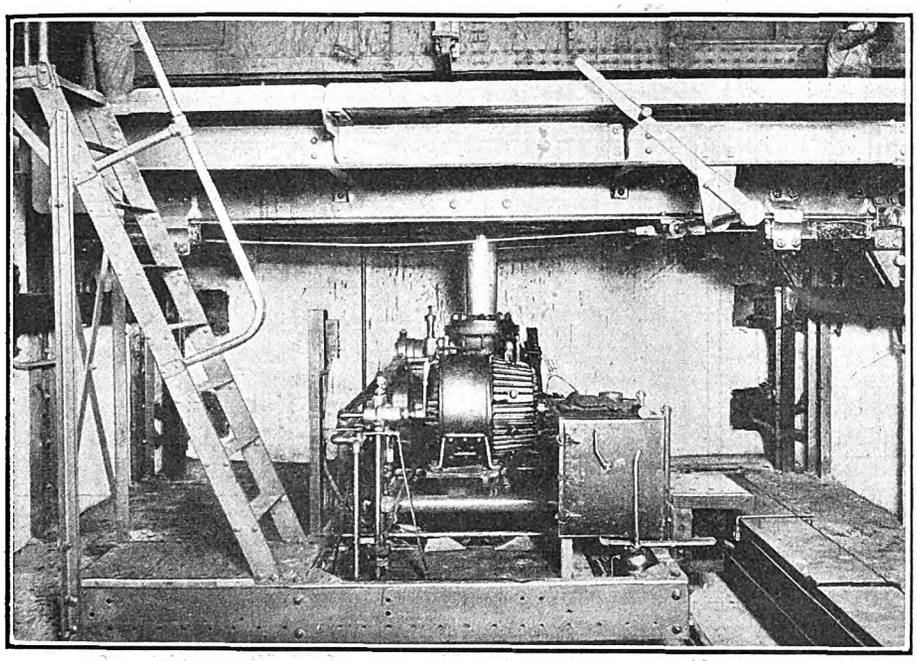
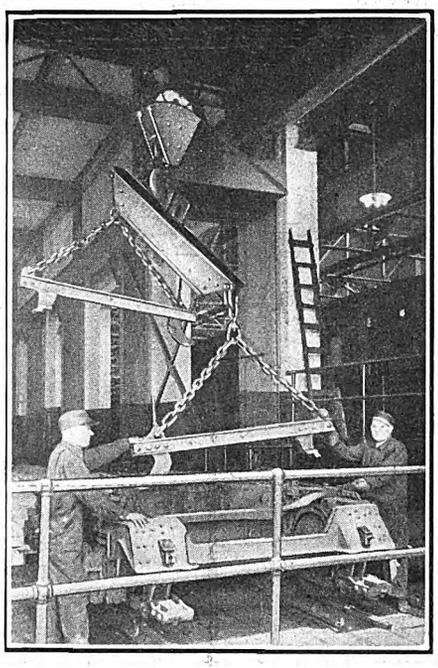




At Left—Pit Jack with Table in Raised Position. At Right—Picking Up a Truck with Overhead Traveling Crane to Place It in Position for Overhauling

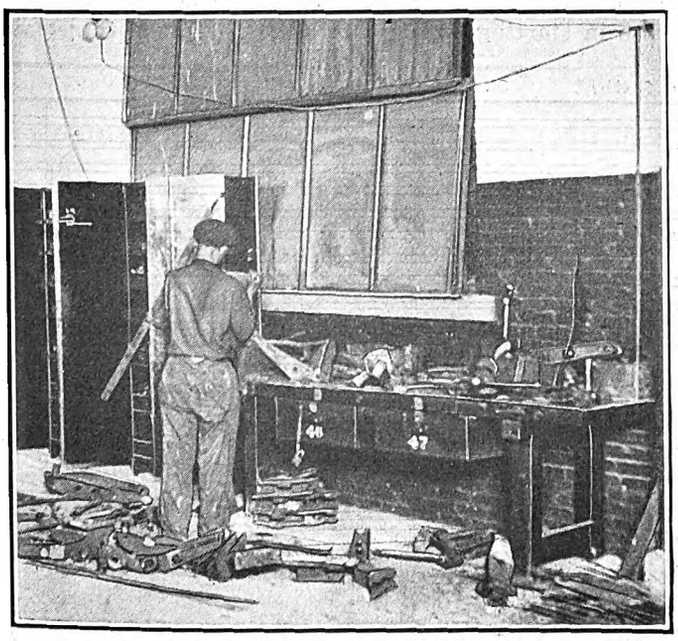
ported from this point to the first parallel track in the new shop by means of the pit jack.

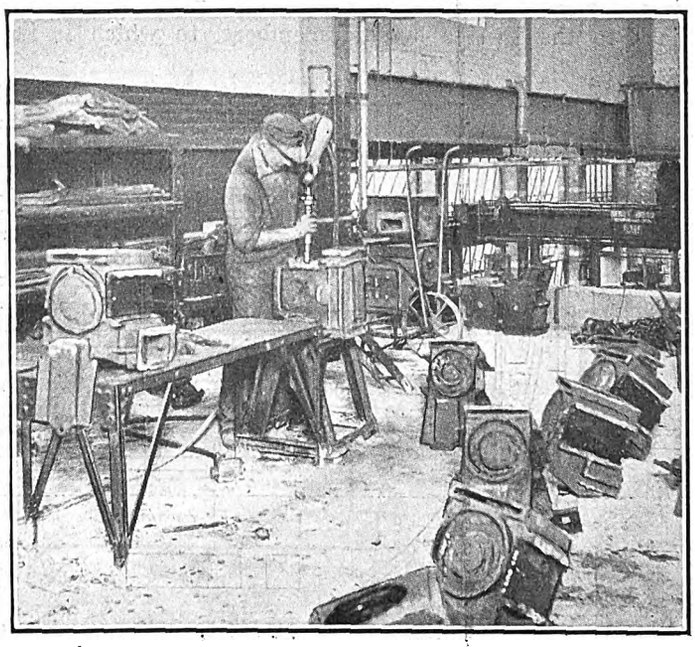
The car bodies are held in a suspended position while the trucks are removed by a special hand-geared traveling crane. This crane has a span of 29 ft. extending over the truck removal track and is equipped with special trolleys and appliances for convenient operation. The crane proper is of typical single I-beam construction, having a 24-in. beam for the main girder, with reinforced side girder. It is arranged with the customary hand chain for travel. Two special trolleys are mounted on this I-beam and two long suspended arms or leg members are fastened to these. Two pneumatically operated cylinders permit the special trolleys to move a definite distance. The suspension members are arranged with hooks at their bottoms which can be inserted underneath the side sills of the car bodies.

The mechanism for operating the trolleys consists of a 6-in. double-acting cylinder, equipped with necessary valves and fittings. Oil is used on one side of the plunger to restrict and vary its speed of travel. Air is admitted to the cylinder through a valve mounted in the center of the crane. The valve is controlled from the floor by drop cords. The control of the oil is likewise governed by an adjustable valve operated from the floor.

Work of Overhauling Influenced by Train Make-Up

Most of the subway cars of the New York Rapid Transit Corporation are operated in groups of three. These are handled as units, being kept together and shopped at the same time. Whenever it is necessary to remove a particular truck the three cars are brought in on what is termed track No. 10. This is the one fitted with the special traveling crane. For convenience of the motorman in stopping the train accurately, so that a particular truck will come in a desired location, large numbers, 1, 2, 3, etc., are placed on sheet steel plates alongside the rail. Thus the motorman can adjust his train accurately for truck removal. With the truck in





At Left—Brake Rigging Is Dismantled, Repaired and Assembled at a Bench. At Right—Riveting Gib Plates in Position on Truck Journal Boxes

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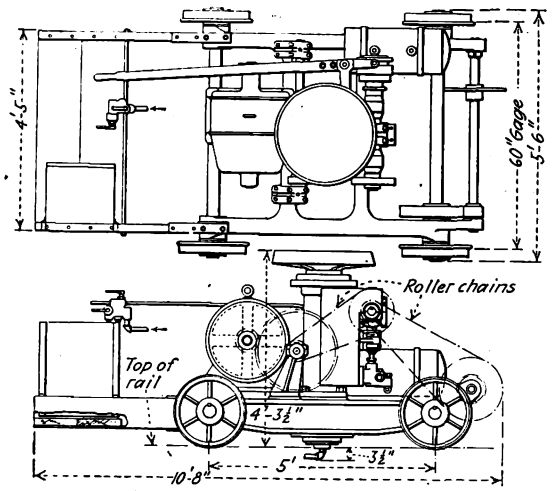
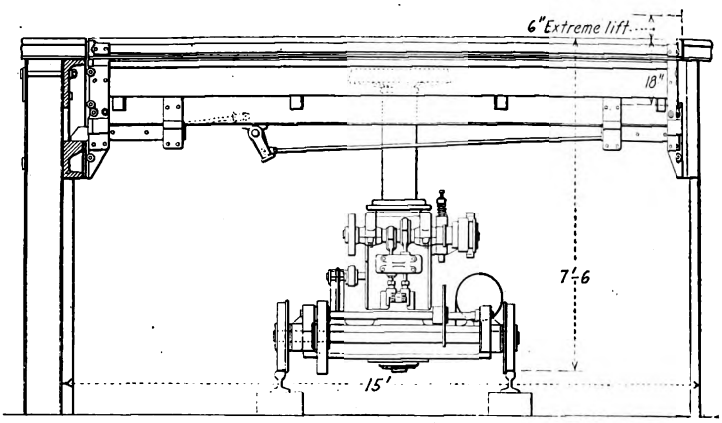




Details of Pit Construction and of Motor-Driven Pit Jack. The Entire Jack Runs on a Track Located Transversely to the Running Rails, so that the Trucks Are Readily Taken Out

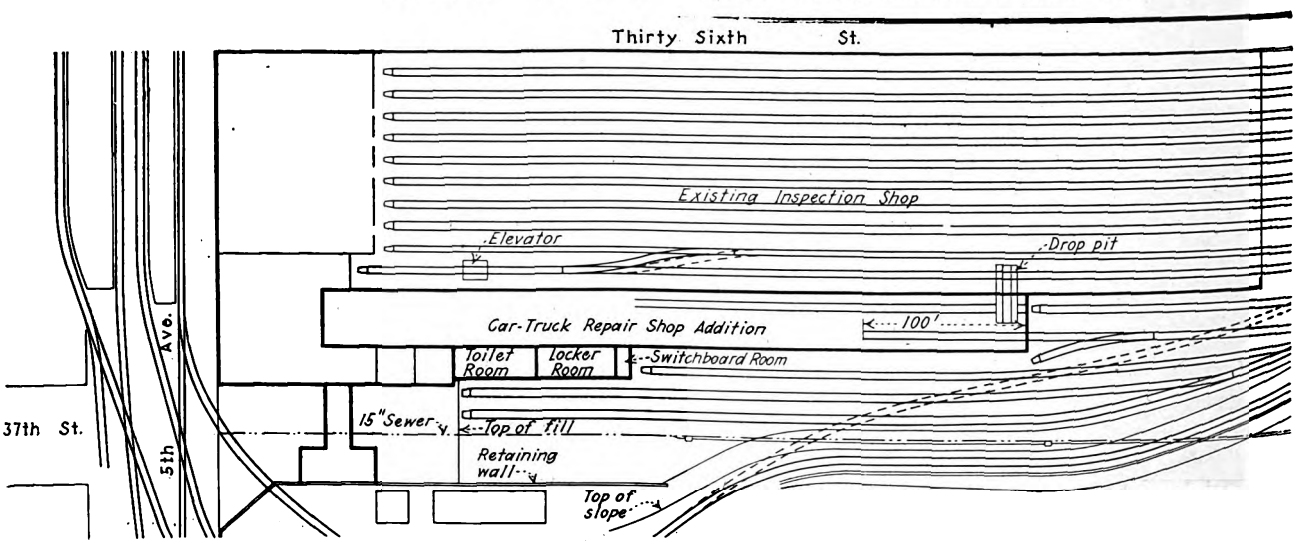
position, the car is lifted slightly by raising the entire end of the body with the 50-ton motor-driven pit jack so that the hooks may be inserted under the side sills. When the hooks are in place the truck is dropped and transported to the adjacent track in the new overhauling section by the pit jack. The pit in which this operates is 15 ft. wide by about 8 ft. deep. The pit jack moves on a track of two standard T-rails at 5-ft. gage. The distance from the tops of these rails to the tops of the running rails on which the cars operate is 7 ft. 6 in.

Pit Jack Is of Novel Construction

A pit jack of new type has been designed to facilitate the removal of the car trucks. Raising and lowering are by means of a ram, provided with a positive stop to prevent pumping out. The rams are of machinery steel and are made with ample bearings in the cylinders and with sufficient diameter to carry the maximum load rigidly. The top of the jack is fitted with a table casting, onto which the truck table fits. The truck table is designed to act as a bridge over the pit and is held in place at the top of the pit by four positive locking bolts, one at each corner of the table. The four bolts are operated in unison from a single lever.

The table itself is a solid unit provided with a steel casting into which the head of the jack fits. This casting is reinforced to transmit the full pressure of the jack to the two table side members, to which it is rigidly secured. These side members are 18-in. I-beams. The rails on which the car trucks operate are attached to the top of the table. Four cast steel guides, one at each corner of the table, keep it in alignment while it is being raised or lowered. Four steel castings, one at each corner of the table, fit into these guides. Their machined surfaces take the side and end play of the table. The top portions of the guides are designed to receive the table supports and to carry the table with its live load when acting as a bridge. These guides are supported by the concrete walls of the pit through imbedded steel members. Self-centering wheel stops hold the truck wheels in position while the table is being lowered or raised. This stop mechanism can be moved toward or away from the rails by a lever.

A 7½-hp. Westinghouse motor operates the hydraulic pump and also drives the pit jack transversely. While the jack is being moved transversely the pump is by-passed. The hydraulic pump is of the two-plunger type, with plungers packed by easily removable adjustable glands. All gears and chain drives are protected with sheet metal covers. A tank is provided for holding the light machine oil which is used in this jack. All vertical and transverse motions of the jack are controlled by a valve mounted upon the jack platform and the operator rides with the jack. The valve arrangement is such that the shop air supply may be by-passed for ease in starting and also to allow the pump to remain



Additional Truck Overhauling Facilities at the 36th Street Repair and Inspection Shops of the New York Rapid Transit Corporation, Brooklyn, N. Y.

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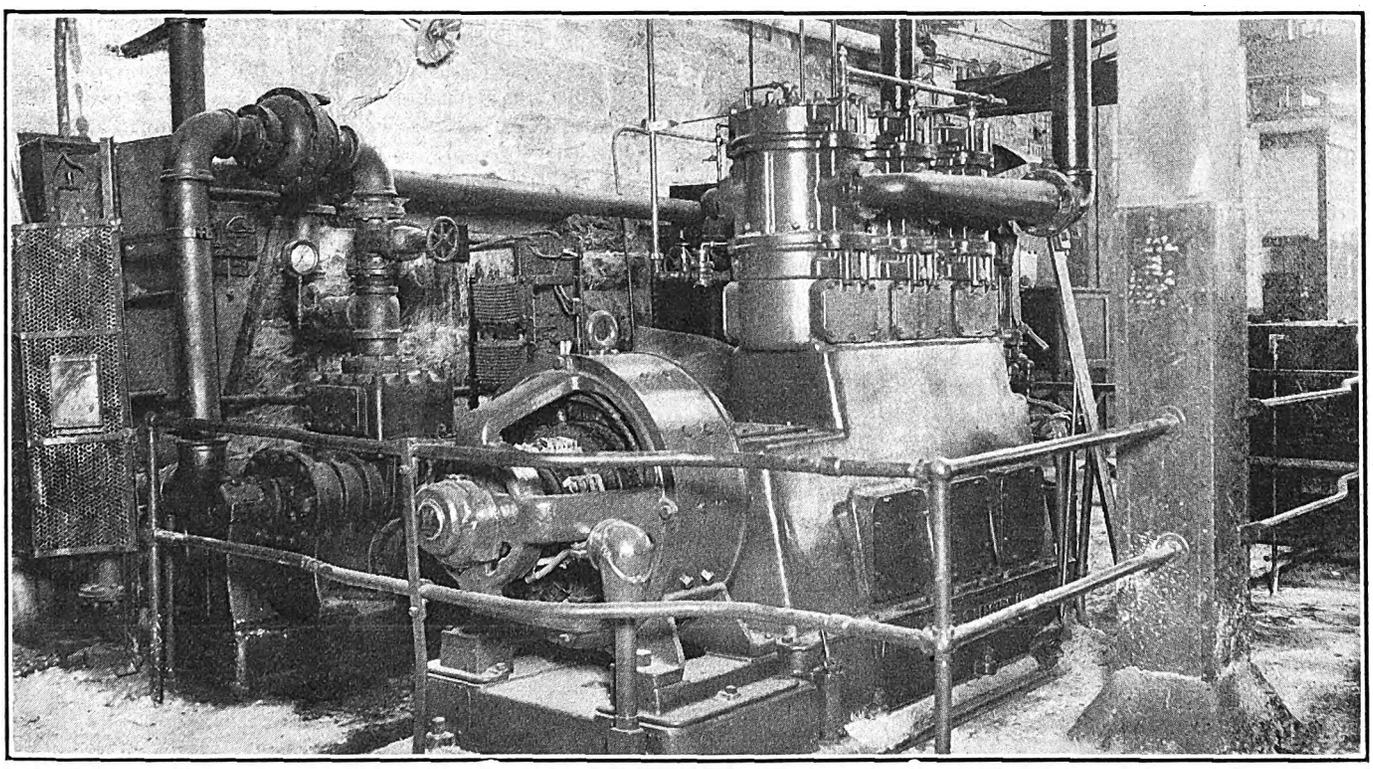
idle while the jack is traversing. A safety valve eliminates the possibility of an overload and also prevents over-pressure in air lines.

A connection is also made to the shop air line and air is admitted to the top of the reservoir tank for forcing the oil through the valves into the hydraulic cylinder. Out of the total lift of the jack, which is 24 in., 18 in. is from the low position to the top of the rail. A further 6-in. movement above this point permits compression of the car springs and lifts the truck and car body for placing in position the suspension members of the overhead crane. The electrical connection from the pit to the crane is made through a third rail with contact shoe. The speed across the pit is about 40 ft. per minute and the lifting speed is 4 ft. per minute. Accompanying illustrations show the construction of this equipment.



A Large Shop Air Compressor Furnishes Compressed Air for Various Pneumatic Tools and for Cleaning During Overhauling

The new section of the shop is used only for overhauling trucks of subway cars, and the overhauling work consists of two classes. First, there is what is termed general overhauling, which takes place every eighteen months. At this time the trucks are taken apart and all equipment is removed. All parts are investigated carefully and everything is renewed or repaired that could not stay out safely for a further period of two years. Any weaknesses which have been found are taken care of by reinforcing. The second class of truck repairs is for crippled cars, where it is necessary to hold these out of service for truck work.

From one of the accompanying illustrations it will be seen that for overhauling the truck is placed on a special type of stand which elevates the truck approximately 12 in. from the floor level. The top members of the stands on which the truck wheels rest are made of standard T-rail. Details of construction of these truck stands were described in the ELECTRIC RAILWAY JOURNAL for May 19, 1923, page 853. The new section of the 36th Street shop is provided with twenty overhauling stands, of which fourteen are used for emergency repairs, while six crews work on general overhauling. General overhauling of trucks is also carried out at the 39th Street shop, where all the general overhauling of the car bodies is also done. At present the six trucks for a three-car unit are overhauled at 36th Street each week. It is the practice to do this work a week preceding the date that the cars are scheduled to go into 39th Street for their general overhauling. Nine men do this general overhauling work. One pulls down and assembles the truck on a piece-work basis. Two men fit up and assemble brake rigging at the bench. With this method shoe heads are assembled and attached to hangers, so that they can be hung into place on the truck frame with the least possible additional labor. Two other men form a riveting crew and one man with the acetylene torch burns off rivets and nuts which have become rusted and does additional welding work. One man, a machinist, drills the pedestals for liners and drills other holes necessary for reinforcing parts. One man on journal boxes removes old pedestal liners and puts on new ones. Another man cleans out and packs journal boxes. He serves as an additional helper for other work.

Four other men do motor overhauling, both for subway and elevated cars, in a section devoted particularly to this work. Truck repair crews for emergency repairing consist of two men. Motor repairs are taken care of separately.

With this method of overhauling, cars are not withheld from service while the repairs are being made, but the car is brought over the drop pit, the truck requiring repairs is removed and another truck is placed underneath the car immediately, so that it can be returned to service. Thus between general overhaulings no attempt is made to keep the trucks with the car bodies under which they left the shop at general overhauling. When the cars and trucks are due again for

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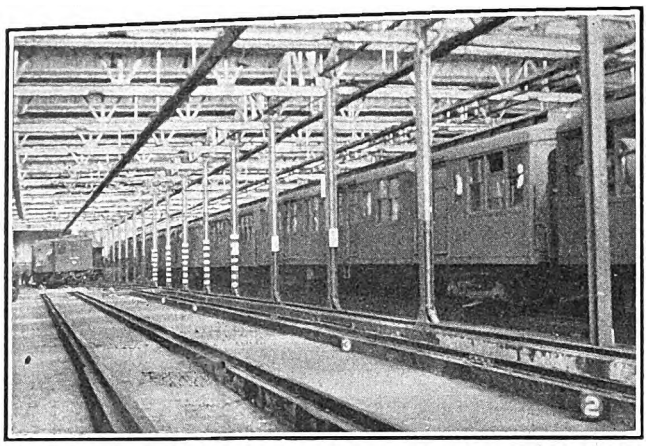


Numbers at Base of Rail Assist Motorman in Locating the Trucks Accurately Over Drop Pit

their general overhauling, however, the trucks are sent into the shop under the same car bodies that they left with.

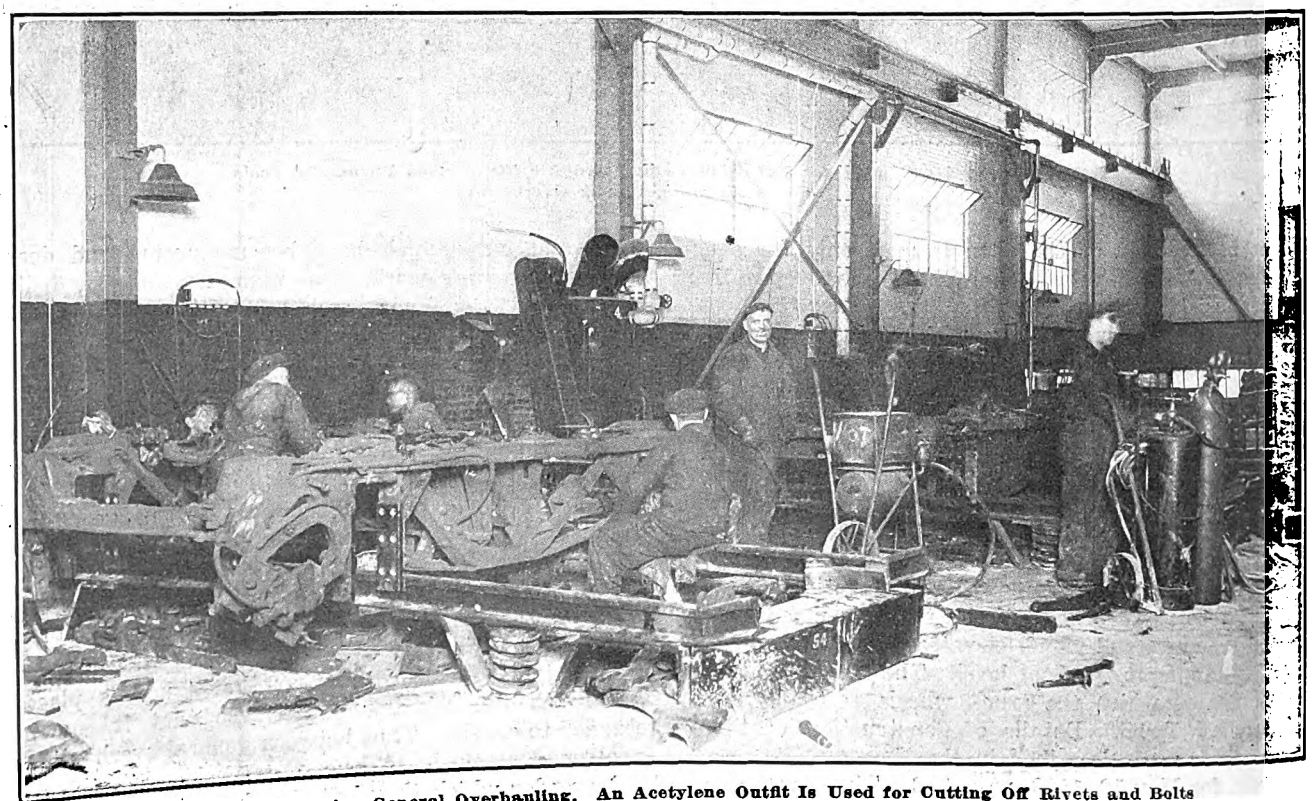
In considering this method of carrying out truck overhauling, one at first might consider that a large number of spare trucks would be necessary. On the contrary, as the plan is carried out by the New York Rapid Transit Corporation no additional spare trucks have been found necessary. The reason for this is that trucks from cars which are in for general overhauling and re-enameling are used to carry out all truck overhauling work. As soon as a train is placed in the 39th Street shop for general overhauling car bodies are raised and placed on supports. This arrangement releases an ample number of trucks to take care of both emergency truck repairs and general overhauling.

The trucks for the subway motor cars are all of one type, but are of four different kinds, due to the arrangement of equipment. Thus, under the same car, trucks for No. 1 end will differ from those at No. 2 end. The leads from the shoe beams are brought to a connecting cable at a different side of No. 1 truck from that necessary with the No. 2 truck and the latter is also fitted with the empty and load braking device. Another factor also affects the interchangeability of trucks. This is the use of emergency trips on cars of this railway. It is the practice to install the electric trip mechanism only on the end trucks of three-car units. There will thus be trucks with and without the electric trip mechanism. This, together with the difference in trucks for No. 1 and No. 2 ends of cars, makes the four kinds of motor trucks necessary. In addition, the company also operates trailers in some train make-ups and the trailer trucks are different from motor trucks. Altogether, there are five kinds of trucks to be overhauled for subway cars.

Accurate Records Save Time

A carefully worked out record system is used to make certain that the correct kind of truck is always available for replacement whenever a car is ordered in, either for emergency repairs or for general overhauling. For convenience in the record work and also in the truck overhauling work a chart has been made up showing the arrangement of cars in the different units. This is framed and hung in a convenient place in the shop office. By referring to portions reproduced in one of the accompanying tables it will be seen that the type B units consist of three motor cars; BX units are made up with two motor cars and a trailer between; BT units consist of two motor cars, and type A units are single motor cars. With this arrangement any number of cars can be made up into a train without disturbing the arrangement of units.

An accompanying diagram also shows the arrangement of cars in a B unit. Reading from left to right in this diagram, it will be seen that the trucks are No. 2 with trips, No. 1 without trips, No. 1 without trips,



A Truck Undergoing General Overhauling. An Acetylene Outfit Is Used for Cutting Off Rivets and Bolts and a Rivet Torch Provides for Heating Fresh Rivets

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ARRANGEMENT OF UNITS—SUBWAY CARS

Type B

2000-01-02	2162-63-64	2324-25-26	2588-89-90
2003-04-05	2165-66-67	2327-28-29	2591-92-93
2006-07-08	2168-69-70	2330-31-32	2594-95-96
2009-10-11	2171-72-73	2333-34-35	2597-98-99
2012-13-14	2174-75-76	2336-37-38	2750-51-52
2015-16-17	2177-78-79	2339-40-41	2753-54-55

Type BT

2816-17	2492-93	2496-97
2490-91	2494-95	2498-99

Type BX

2400-4000-2401	2438-4019-2439	2476-4038-2477
2402-4001-2403	2440-4020-2441	2478-4039-2479
2404-4002-2405	2442-4021-2443	2480-4040-2481
2406-4003-2407	2444-4022-2445	2482-4041-2483

Type A

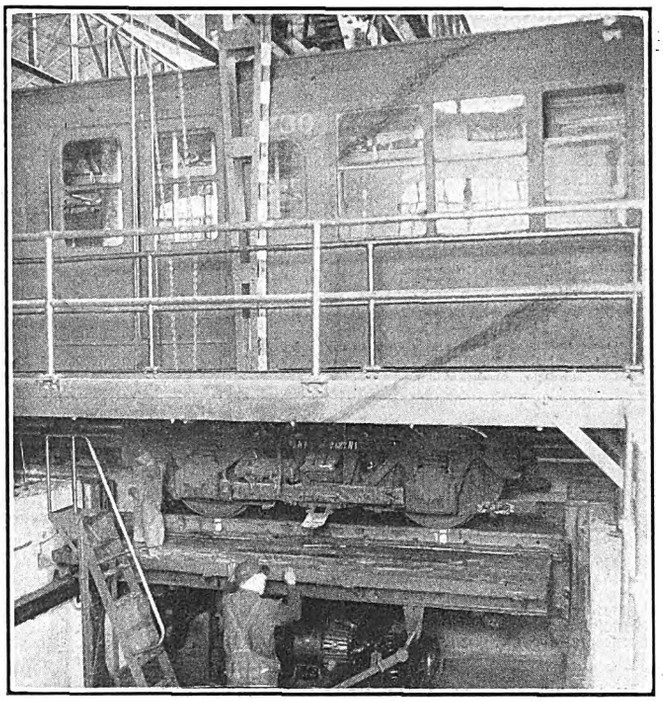
2399	2624	2650	2676	2702	2728
2500	2625	2651	2677	2703	2729
2600	2626	2652	2678	2704	2730
2601	2627	2653	2679	2705	2731
2602	2628	2654	2680	2706	2732
2603	2629	2655	2681	2707	2733

No. 2 without trips, No. 1 without trips and No. 2 with trips. Thus, as No. 2 trucks are the only ones provided with trip cocks, such a three-car unit has but three kinds of trucks.

A crew which does general overhauling averages one truck per day. Both trucks under the same car will thus be overhauled in an interval of two days, and the entire three-car unit will be completed in a week. In order to take care of this work without withholding the trains from service, three spare trucks are used, and on Monday morning a No. 2 truck with trips, a No. 2 truck without trips and a No. 1 truck without trips are ready for replacing like trucks which are to be overhauled.

Early Monday morning the three-car unit is brought into the shop and the No. 2 truck with trips and No. 1 truck without trips are removed and replaced on car No. 1. These trucks are overhauled and ready for use again Wednesday morning when the unit is again brought in. Then the No. 1 truck without trips and No. 2 truck without trips from the center car No. 2 are removed and replaced. On Friday morning the third car of the unit has its trucks removed, which consist of No. 1 truck without trips and No. 2 truck with trips. These are then overhauled, so that the same combination of trucks is again ready the following Monday for use in overhauling a new unit.

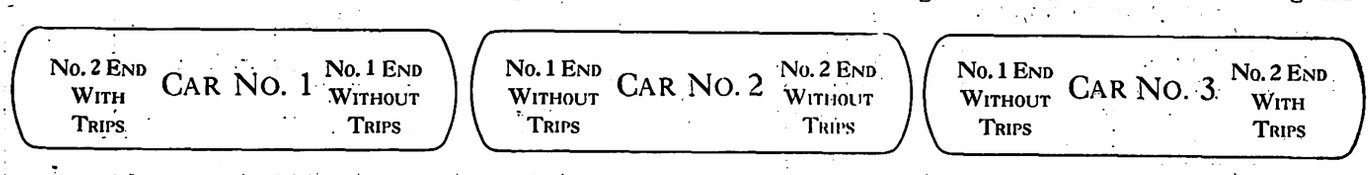
Two card record systems are used to keep track of the trucks and to give immediate information as to the location of any particular truck. One of these is arranged by car numbers and the other by truck numbers. The car cards show the trucks in and out, together with dates. The truck cards give the car numbers in which the trucks are installed or removed, together with date. The drop table crew keeps in a book a record of trucks as they are removed and installed. There are two sets of books, so that one set may be worked on in the office, while the other is used by the transfer table crew. These books are arranged with columns to show the number of the truck, the car from which it is removed and time of removal, the number of the truck which is replaced and the time that it goes under the car.



Lowering a Truck by Means of the Pit Jack

Disconnecting of leads, brake rigging, etc., preparatory to the removal of the truck is done by crews in the inspection shop on the track adjacent to that used for dropping out the trucks. When a train is placed in position for disconnecting preparatory to removal of the truck a whistle is blown as a signal and one of the regular inspection crews then does this work.

With the arrangement and schedule now being carried out, an average of twelve trucks per day are taken care of for emergency repairs. The average time from the placement of a car over the drop pit until a new truck is in position so that the train can be taken away is twelve minutes. The transfer table crews gage and adjust side bearings before the car goes



Arrangement of Units in Three-Car Trains. Only Three Types of Trucks Are Needed

MD FORM 15C NEW YORK RAPID TRANSIT CORPORATION MD 1-25
MECHANICAL DEPARTMENT

CARS TO BE REPAIRED

REPORTED BY 36 St. INSPN. SHOP FOR REPAIRS AT ..... REPR. SHOP

Time 2 PM Date 5/18/24

Car No.	Defect or Repairs Required	Date O.K.
2629	Field leads out	5/16
	#1 Motor	
	O.K. Yes	

Foreman.

Form MD-15-C Is Used for Reporting Trucks Which Require Repairs

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to the inspection pit for reconnecting leads and brake rigging. The shop crews work from 7 a.m. to 4:30 p.m. each day and the transfer table crew from 8 a.m. to 5:30 p.m.

The ordering in of cars and the time at which they are to be placed for overhauling is under the direct supervision of the general repair shop foreman. Crippled cars are turned over by the inspection shop forces by filling out form MD 15 C, which shows cars to be repaired. An accompanying illustration shows one of these forms. In making out this form the foreman marked it OS yes, or OS no, showing that the car is out of service and cannot be operated until repairs are

Cars held in at 5:00 P.M. June 11, 1924, 36th St. Repair Shop.

*925	#2 motor flashing	1
929	#2 motor flashing	1
1038	SCA #2 motor, FW 1-2 pr.	1
		3
2135 (2136-37	Worn journal box liners #2 end	1-2
2159 (2160-61)	SFW #2 end	1-2
2189 (2190-91)	Cracked wheel #3 pr.	1-2
2721	SFW #2 end	1
2737	#1 end, SFW& #2 end, #3 pr. cracked wheel	1
2860 (2861-62)	Grd. BH. SCA, mtr. leads	1-2
		14

*Not OK 7:00 A.M. June 12. Last car up at 11:55P.M

Summary	Elev.	Subs.
FW	0	0
Ams.	1	0
Miscell.	2	14
	3	14

Armatures on hand
1-WH 50 L
2-WH 50 B
6-WH 300
2-WH 50 E
4-Walk. L-15
1-GE 248

Cars handled in the Overhauling Shop June 11, 1924.

929	Time on slip	On elev.	OK
929- #2 motor flashing	1:30 PM	5:16 PM	11:13PM
1038-SCA #2 motor, FW 1-2 pr.	1:30 PM	4:49 PM	11:30PM
2055-Worn spring plank hangers & worn shoe head hangers #2 end	For AM	12:28 PM	2:51PM
2097-Motor lead burned off on top of shell #1 motor	5:15 PM	6:48 PM	10:32PM
2135-Worn journal box liners #2 end, 7-8 box	For AM.	1:58 PM	4:55PM
2159-SFW #2 end	For AM	1:04 PM	6:15PM
2171-JBL #1 end	For AM	2:25 PM	4:13PM
2189-Cracked wheel #3pr.	2:25PM	7:02 PM	11:55PM
2207-JBL 1-2 ends	For AM	12:45 PM	3:09PM
2325-Broken Axle brgs. #1 gear	For AM	11:10 AM	3:38PM
2326-Broken axle brg. #1 gear	For AM	10:59 AM	3:35PM
2471-Flat wheels 1-2-3-4 pr.	7:00AM	6:25 AM	10:26AM
2570-Flat wheels 1-2-3-4 pr.	7:00AM	6:00 AM	11:56AM
2715-Hot axle brgs. #1 motor	7:00Am	6:50 AM	10:43AM
2721-SFW #2 end	For AM	2:12 PM	10:15PM
2737-#1 end, SFW, #2 end. #3 pr. cracked wheel.	11:50AM	1:27 PM 6:31 PM	7:58PM 9:55PM
2860-Grd. Brushholder, SCA, Mtr. lead burned off #2 motor	2:30PM		

Accident - None

36th Street Repair Shop Sept. 3rd, 1924.

Mr. J. V. Talbot,
Div. Supt.

The following cars to be ordered in at 9.00 o'clock tormorrow morning Sept. 4th, without fail:

2156 - Loose rivets on pedestal liners #2 end, #5-6 boxes
2157 - " " " " " #2 end, #7-8 boxes
2804 - bkn, ell.sprg. #1 end,
2279 - relocate shoe head guide #2 end, #7 wheel.
2891 - bkn. ell. sprg. #2 end.
2897 - S.F.W. #1 end.
2896 - S.F.W. #1 end.
2695 - S.F.W. #1 & 2 ends.
2190 - S.F.W. #1 end.
2888 - worn jnl. box, #2 end, #7 box

Cars reported to Repair shop for defects but not to be ordered in and to be continued in service:

2849 - relocate shoe head guide #1 end #3 wheel
2323 - relocate shoe head guide #2 end #7 wheel
2776 - S.F.W. #1 & 2 ends
2778 - Ditto
2777 - "
2229 - S.F.W. #1 & 2 ends, sprg. plk. $1 end
2002 - F.T.W. #1 end & loose helical sprg. cstg. #2 end

The following cars held Out of Service 5:00 P.M. Sept. 3rd, 1924:

755 - #1 mtr. flshg.		1
844 - O.C.A. #2 mtr.		1
900 - hot jrl. #2 end #7 box		1
908 - bkn. bolt in sprg. plk. #1 end		1
910 - hot axle brgs. #1 mtr.		1
914 - hot arm. brgs. #2 mtr. G.S., S.F.W. #1 & 2 prs., mtg. for 2 50-B pinions		1
1005 - #1 & 2 mtrs. flshg.		1
1010 - grd. fields & S.C.A. #1 mtr.		1
1094 - hot axle brgs. #1 mtr.		1
		9
2066 (2068)	bent sprg. plks. #1 & 2 ends	2-1
2067	S.F.W. #2 ends	
2127 (26-28	S.F.W. #2 end	1-2
2344 (43-2240)	bkn. ell. sprg. #2 end	1-2
		4-5
		9

At Left—Report of Cars Held in at 5 P.M. and Cars Handled in the Overhauling Shop. At Right—Form Used for Ordering Cars in for Truck Overhauling

made, or that it may continue to remain in service until the repair shop is ready to order it in for repairs.

Two types of reports are made out from the form MD 15 C. One of these consists of a report of cars held in at 5 p.m. and gives the car number and the reason for holding in. At the bottom of this same report is a record of cars handled in the overhauling shop during that day. This report gives the car number, the defects for which repairs were made, the time that the slip was turned in, the time that the car was placed over the drop pit and the time that the car was approved and ready for service. The second form is one which is delivered to the division superintendent each morning for ordering in the cars that are to be repaired during the day. It will be appreciated that in making out these reports a careful check must be made of the trucks which are available for replacement and also of the time that trucks will be finished and can be used for replacing the same kind of truck under other cars. Otherwise there might be a delay in waiting for one of the proper trucks to be finished.

Fire and Watchman's Signal System in Torrance Shops

PROMPT assistance can be given to the night watchman in case of emergency by means of a complete automatic fire alarm and watchman signal system recently installed in the Torrance shops of the Pacific Electric Railway, Los Angeles, Cal. It also provides better fire protection.

This system consists of a relay panel switchboard, fire and watch recording units, master clock, call bells, motor-generator set, batteries, etc., in the power house and 42 fire and watchman boxes located throughout the yards and buildings. In connection with the fire alarm equipment, a new motor-driven high-pressure water pump is being installed in the power house.

This signal system is similar to the ones used in many cities where the fire boxes are located on street corners and in case of fire are operated by breaking a glass window and pulling down a lever to cause the sounding of an alarm in the fire station, together with the display of a call number to give the location of the box pulled.

At Torrance the alarm signals are received and recorded in the power house by a device that punches holes in a paper tape and at the same time blows the drill whistle and sounds the three alarm gongs.

Each box has a code number of two or three figures which are represented by short blasts on the whistle and single strokes on the alarm gongs.

Since it would hardly be possible to remember the number and location of 40 alarm boxes, unless an easily remembered numbering plan is used, the yard is divided into four fire zones by north and south lines.

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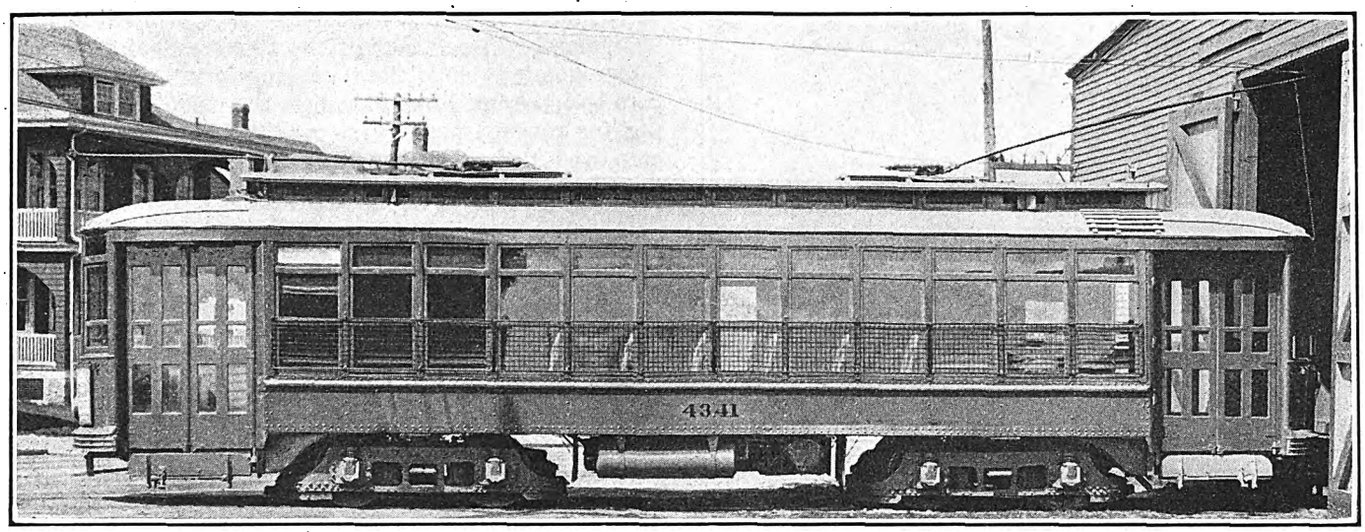

Type of 44-Ft. Semi-Convertible Car Which Is Repainted at a Cost of $69 by the Eastern Massachusetts Street Railway

Modernizing Car Painting Methods*

Spray Painting, Together with a One-Coat System, Simplified Color Scheme, Standardized Operations and a Premium System of Wage Payment, Produced a Saving of $42,000 per Year

By H. T. Hurlock
Engineer of Equipment Eastern Massachusetts Street Railway, Chelsea, Mass.

PARTICULAR attention has been paid during the past four years to car painting by the Eastern Massachusetts Street Railway. The officials of this road believe that they cannot afford to operate ill-appearing cars in competition with private automobiles and buses and that electric car service cannot be advertised in any cheaper manner than by attractive rolling stock. Of the 734 revenue passenger cars owned and operated by the company, about 600, or approximately 82 per cent, will be put through the shops this year for painting. The schedule for painting cars is arranged on a mileage basis and cars are brought in for repainting every 35,000 miles. With the present service of the Eastern Massachusetts Street Railway, this brings regular cars in for painting every ten to twelve months. Cars in irregular service come in for painting approximately every eighteen to twenty-four months.

The practice of repainting cars on a mileage basis has worked out very satisfactorily on this property. Experience indicates that cars in irregular service do not require painting as frequently as those performing all-day service. This has been emphasized particularly with irregular cars that are stored under cover.

A new painting problem has been introduced through the damage to car paint by contact with automobiles, trucks, etc. This makes repainting necessary at more frequent intervals than has been required in the past. On the Eastern Massachusetts system it is quite unusual to have a car come in for painting with side panels free from mars or scratches made by the tailboards of trucks. Quite often these scratches run the full length of the car body. Through substantial reduction in the cost of painting cars more frequent repainting has been made possible.

In 1915 the flat color and varnish system was used and the cost of repainting a double-truck car was $134. At that time painters were receiving the low rate of 29.6 cents per hour, and it required an average of 365 man-hours to turn out a finished car. An accompanying illustration shows the time required and cost for painting cars for the years 1910, 1915, 1920 and 1925. By referring to this it will be seen that the painting cost practically doubled during the war. The company changed over to an enamel system in 1920 and the cost of repainting a double-truck car was $257, with labor at 62 cents per hour. Paint materials during this interval increased from 100 to 200 per cent.

The method used with the enamel system consisted of removing the old body paint by burning off and then giving the outside a priming coat, putty and leveling coat and two coats of enamel. Doors and sash were stripped from the car, scraped and primed and were then painted with one coat of sash color and one coat of enamel. Repainting, as carried out in 1920, involved most of the work of an original finish, but with many refinements that are no longer considered necessary.

Early in 1921 the company set about to reduce the high painting cost and the results obtained were very gratifying. The cost of repainting a double-truck car at the present time is $69, with labor at 58 cents. This includes car washing and glass cleaning. This cost is considerably lower than that of 1913, although labor and materials have doubled in cost.

The reduction in cost of painting has been brought about through five important contributing factors: First, a change was made in the painting system, so

*Based on a paper presented at New England Street Railway Club, May 28, 1925.

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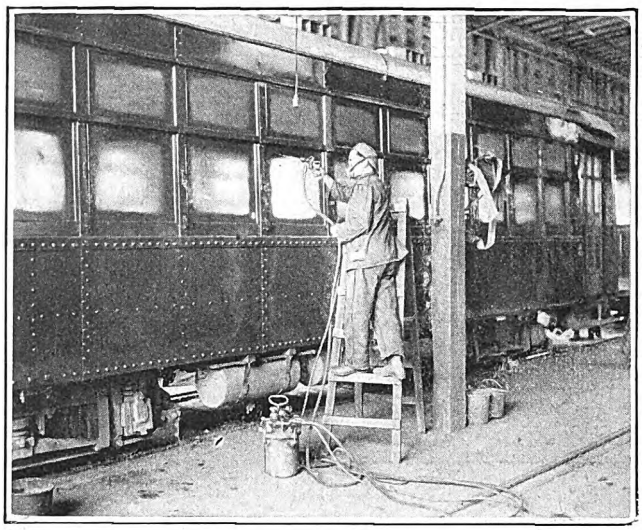
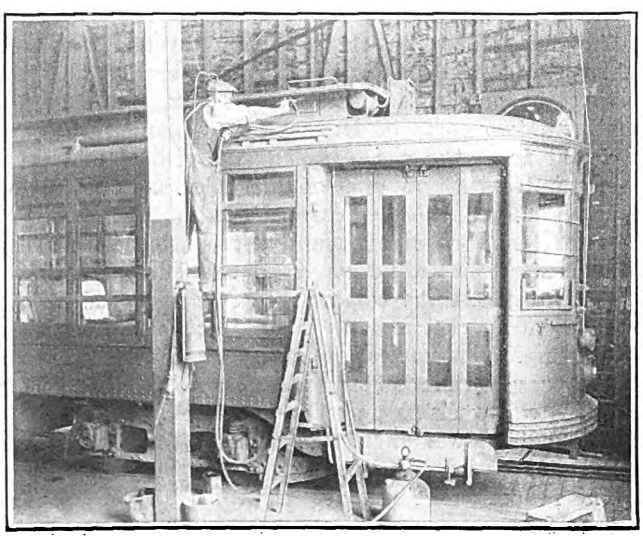


The Entire Car Body Exterior Is Spray Painted with Sash and Doors in Place

that the number of coats required was reduced from four to one; second, pneumatic spray painting was adopted; third, a simplified color scheme was adopted and many things previously considered essential in painting were eliminated; fourth, the schedule of operations was standardized, and fifth, a premium system of wage payment was adopted.

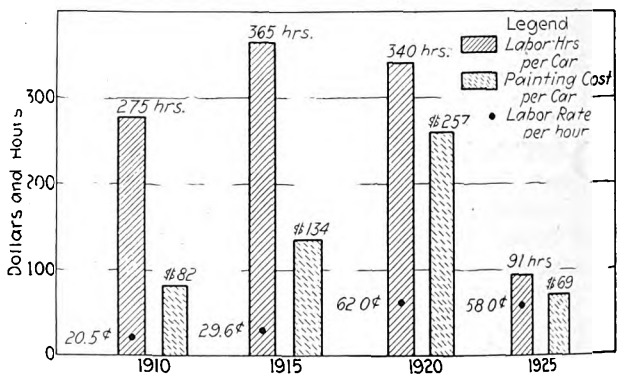
By gradually improving the paint condition of rolling stock during the past four years the company has been able to eliminate numerous coats of paint that were formerly considered necessary, and today a satisfactory finish is obtained with a so-called one-coat system. The comparatively low cost which has resulted has permitted more frequent painting and enabled the company to keep its cars in a better and more attractive condition.

A change from the hand brush method of applying these paints to the spray method was made early in 1921. This has proved of great assistance in reducing painting costs. At first, spray painting was used only for the application of paint to trucks and equipment, but has now been extended to include the entire body exterior, roof and floor. Not only has increased speed in painting resulted with less cost, but the work done is better, since brush marks are eliminated and cracks and crevices are covered more thoroughly. Experience shows that a spray gun operator will do the same work in from one-third to one-half the time required by the brush method. Since the cost of labor constitutes approximately 75 per cent of the total car painting cost, the economic value of the spray gun for painting railway cars is apparent. In addition to the use of spray painting for revenue passengers cars, the company has also employed this method extensively for painting snow-fighting equipment, service cars, buildings, trucks and buses.



In Spray Painting the Roofs of Cars Unique Wooden Guards Are Used to Protect the Upper Deck Sash

One distinct advantage of the spray gun method of applying paint comes from the fact that more material can be applied in a single application than with the brush method, and with correct air regulation a smoother and finer finish is secured. Approximately 10 per cent more material is now used with the spray gun method than was formerly used with the brush method. Of course, some of this material is lost in the process of atomizing and is carried off in the atmosphere, but the greater proportion of the additional material adheres to the car surface, and in consequence a better covering is obtained than was possible with a single coat hand brushed. The amount of paint which passes through the gun is under perfect control at all times, when the spray nozzle has once been adjusted and the air pressure on the paint reservoir determined. Air pressures required for spray painting vary with the consistency of the materials used and can be determined only by experience. The Eastern Massachusetts Street Railway uses 15 lb. of air pressure on the paint reservoir and 70 lb. on the nozzle for spraying the enamel. Roof paint is sprayed with 10 lb. on the reservoir and 50 lb. on the gun nozzle.



Time Consumed and Car Painting Costs for 44-Ft. Double-Truck Car at Five-Year Intervals from 1910 to 1925 Inclusive

An important point to be considered in installing a pneumatic spray system is to provide ample air capacity so as to have sufficient pressure always available for the full number of operators that will be employed. The compressor used by the Eastern Massachusetts Street Railway is a 50-ft. shop type, supplying air for three operators. Another important consideration is to make provision so that the air will be free from water, oil and grit.

In painting cars operators are protected from the fumes by respirators, and during the four years that spray painting has been employed there has been no indication of any detrimental effect on the workers. Particular attention is paid to ventilating the shop by keeping the doors open in the front and rear when weather permits. In the winter season, when it is necessary to keep the doors closed, a 36-in. exhaust fan of 13,000 cu.ft. capacity is utilized to disperse the fumes. By providing for ample circulation of air in the immediate vicinity of the work much of the objection to spray painting by workers is overcome.

It was found that spray painting of cars could be

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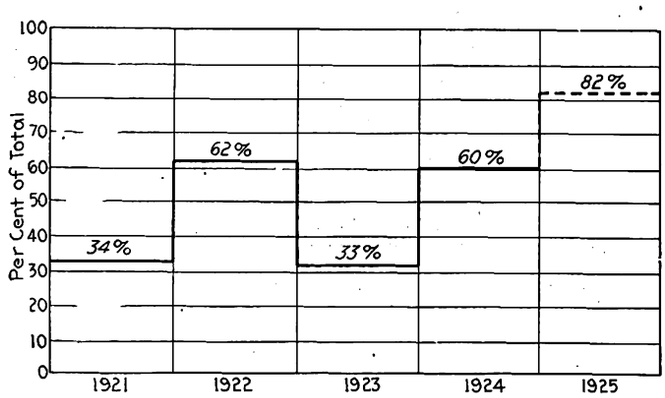
made much more effective and economical by simplifying the car color scheme. The use of many colors complicates spray painting, since precautions must be taken to protect the parts which are not to be covered with the particular coat that is applied. The Eastern Massachusetts Street Railway has eliminated the use of a separate outside color for doors and sash and now spray paints the entire body from roof to sill with a standard light yellow color. The color scheme has been further simplified by spray painting the floors, seat frames, trucks and equipment the same color as the roof, which is an olive gray. Striping and other refinements have been eliminated and plain black car letters are used. Window guards are dipped in black enamel.

Preparation of Car for Spray Painting

In preparing a car for spray painting the trimmings, signs, seat cushions and window guards are removed and the car is washed thoroughly both inside and out. A cleaner, mixed with soft soap and water, is used for loosening the dirt. This is followed by sponging off the interior and the outside is rinsed with a hose-connected water brush. As soon as the car has dried the roof is sprayed with one coat of oil paint. All bruised body parts and loose paint are scraped, sanded and primed.

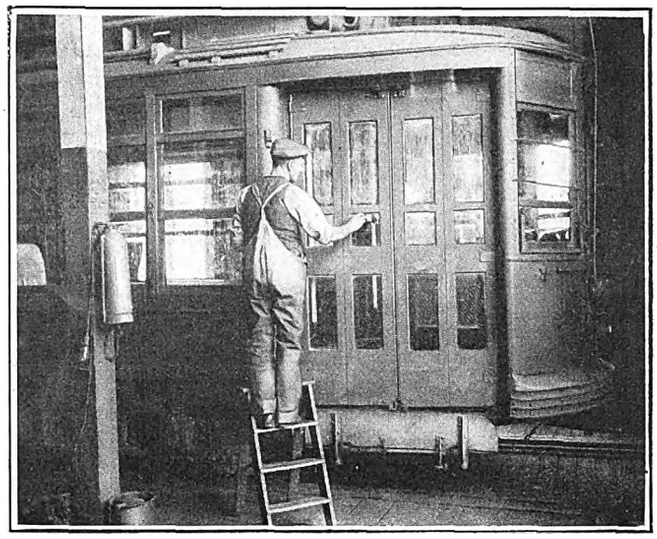
Since the sash and doors are spray painted without removing them from the car, provision has been made to prevent the paint from becoming attached to the glass. A semi-liquid substance, known as "Preservitt," is hand brushed on all outside glass. This material hardens in a few hours, and after the spray painting has been completed any paint sticking to the glass can be readily scraped off and the glass cleaned. Following the application of "Preservitt" to the windows the entire body is sprayed with one coat of yellow enamel. The remaining outside body painting consists of lettering and touching up.



Percentage of Total Revenue Cars Painted Annually During Last Five Years

Refinishing Car Interiors

Interior headlinings and bonnets are hand brushed with one coat of white enamel. Other interior parts, such as sash and doors, are usually hand brushed with a single coat of mahogany enamel. Trimmings and moldings on the inside are finished in natural wood and are given one coat of rubbing varnish. The majority of the company's cars are equipped with rattan seats. These are cleaned thoroughly and are bleached and varnished. Upon completion of the inside finish all glass is cleaned and polished and the floors, seat frames, heaters, steps, trucks and underbody equipment are sprayed with a coat of olive gray paint.



Applying "Preservitt" to Car Windows in Preparation for Spray Painting

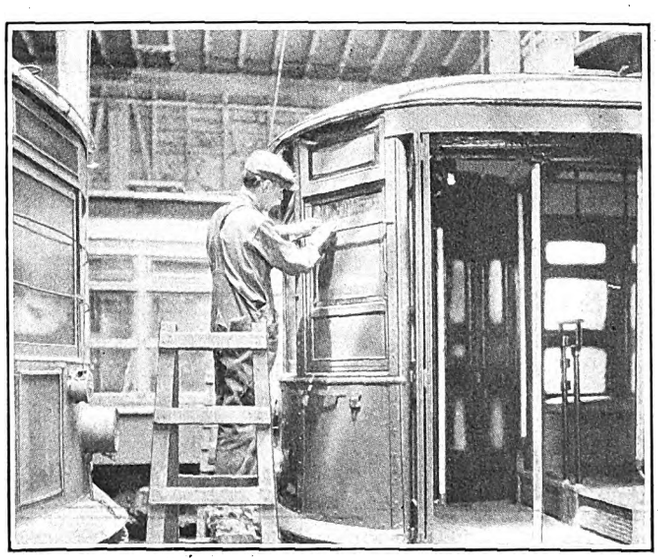
The man-hours required for repainting a double-truck, 44-ft., semi-convertible car by the preceding plan is shown in the accompanying table:

	Work Done	Man-Hours
1	Strip cars	1.0
2	Wash and clean inside and outside in preparation for painting	18.1
3	Apply "Preservitt" to all glass outside	1.8
4	Spray paint roof one coat	2.5
5	Scrape, sand and prime necessary parts	2.5
6	Spray body one coat enamel	4.5
7	Letter	3.0
8	Interior finish complete — hand brush one coat	29.0
9	Clean and polish glass	17.8
10	Spray paint floors, seat frames, heaters, platforms, trucks and equipment.	2.9
11	Miscellaneous	4.9
12	Replace trim	1.5
13	Touch up after trim	1.4
		90.9

The actual cost of repainting the above car may be segregated as follows:

Painting (direct labor)	$30.00	
Paint materials	17.00	
Total	$47.00	
Washing car before painting, stripping and replacing trim and cleaning glass (direct labor)	$21.90	
Total cost of repainting car		$68.90

The corresponding cost for refinishing a standard single-truck safety car follows:



Removing "Preservitt" After the Completion of Spray Painting

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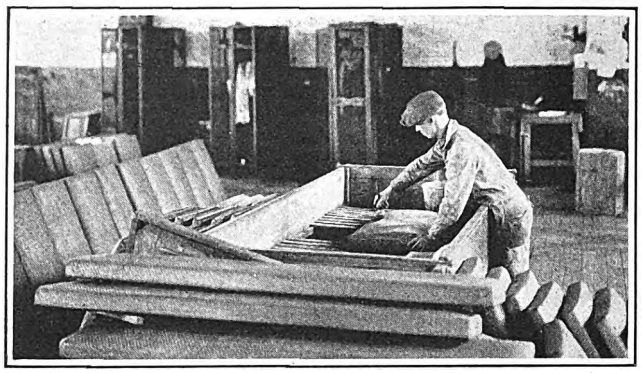


Car Seats Are Cleaned by Applying the Cleaner with a Brush

Painting (direct labor)	$17.00	
Paint materials	11.00	
Total	$28.00	
Washing car before painting, stripping and replacing trim and cleaning glass (direct labor)	$12.54	
Total cost of repainting safety car		$40.54

A definite schedule of operation has been established for the painting of each type of car and all operations have been standardized as to time. This plan has permitted the use of a premium system of wage payment, and the men by diligent work are permitted to earn a bonus in excess of their nominal week's wages. Standardization of painting operations has played an important part in the program for lower costs. Accounts of the company show that for the year 1920 the expenditures for account 30B—car painting—were $21,635, for which 84 double-truck cars were repainted at an average cost of $257 per car. The direct savings for the four years, 1921 to 1924 inclusive, were $169,381, or an average rate of $42,000 per year. An analysis of car painting expenditures follows:

Number Double-Truck Cars Painted	Year	Actual Expenditures for Car Painting (Acct. 30B)	What Expenditures Would Have Been Under 1920 Painting System
263	1921	$33,145.00	$67,591.00
325	1922	35,434.00	83,525.00
232	1923	26,030.00	59,624.00
344	1924	35,158.00	88,408.00
		$129,767.00	$299,148.00
Saving			$169,381.00

The company's shops are not of the most modern type and as a result it has been impossible to utilize the spray painting method for interior painting of cars to the extent desired. Interior car painting requires extensive systems of ventilation, but the officials of the company feel that additional economies will be effected by spray painting car interiors.

The company is also experimenting with the lacquer system of painting cars, and in order to try this out has sprayed five experimental cars with lacquer paints of different manufacturers. Up to the present, it appears rather questionable as to whether the lacquer system of painting will prove superior to the enamel system now employed. It appears that lacquer materials cost more than enamel and that a greater number of coats are required. The final gloss does not compare with the gloss which the company is obtaining through the use of high luster enamel. The longer life of lacquer paint, however, may prove an ultimate economy.

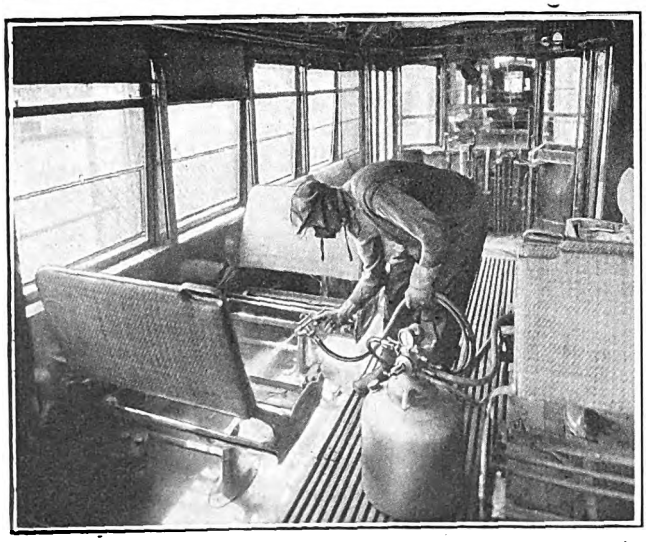
EASTERN MASSACHUSETTS STREET RAILWAY—COMPARISON OF PAINTING METHODS, YEARS 1920 AND 1925

PAINTING 1920—HAND METHOD

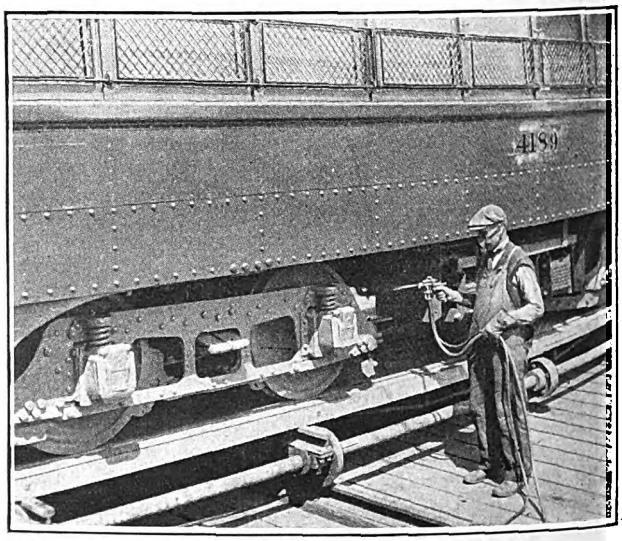
		Hr.
1	Strip, including doors and sash. Wash inside and outside	43
2	Burn off and scrape necessary parts	23
3	Sandpaper and prime	20
4	Putty and level coat	16
5	Sand and first coat enamel	18
6	Second coat enamel	12
7	Window guards—one coat lead, one coat enamel	5
8	Letter, stripe, etc	15
9	One coat roof color	7
10	Truck, equipment—one coat. Fenders—two coats	11
11	Inside finish—bleach, shellac, one coat varnish	37
12	Headlinings and bonnets—two coats white lead color—one coat white enamel	26
13	Sash and doors—scrape outside, touch up, one coat sash color, one coat enamel; bleach inside, touch up, two coats varnish	50
14	Floors—one coat. Seat ends—two coats	12
15	Clean glass	20
16	Miscellaneous and refitting	25
	Total hours labor	340

PAINTING 1925—SPRAY AND HAND METHOD

		Hr.
1	Strip car	1
2	Wash complete inside and outside	18.1
3	Apply "Preservitt" to all outside glass	1.8
4	Spray paint roof—one coat	2.5
5	Scrape, sand, prime necessary parts	2.5
6	Spray body—one coat enamel	4.5
7	Letter	3.0
8	Interior finish complete—hand brush one coat	29.0
9	Clean and polish glass	17.8
10	Spray paint floors, seat frames, heaters, platforms, trucks and equipment—one coat	2.9
11	Miscellaneous	4.9
12	Replace trim	1.5
13	Touch up	1.4
	Total hours labor	90.9



Parts Inside Cars that Are Spray Painted Include Seat Frames, Heater Risers, Floor and Platforms. The Color Used Is the Same as the Roof



Trucks and Under-Body Equipment Are Spray Painted and Operators Are Protected from Fumes by the Use of Respirators

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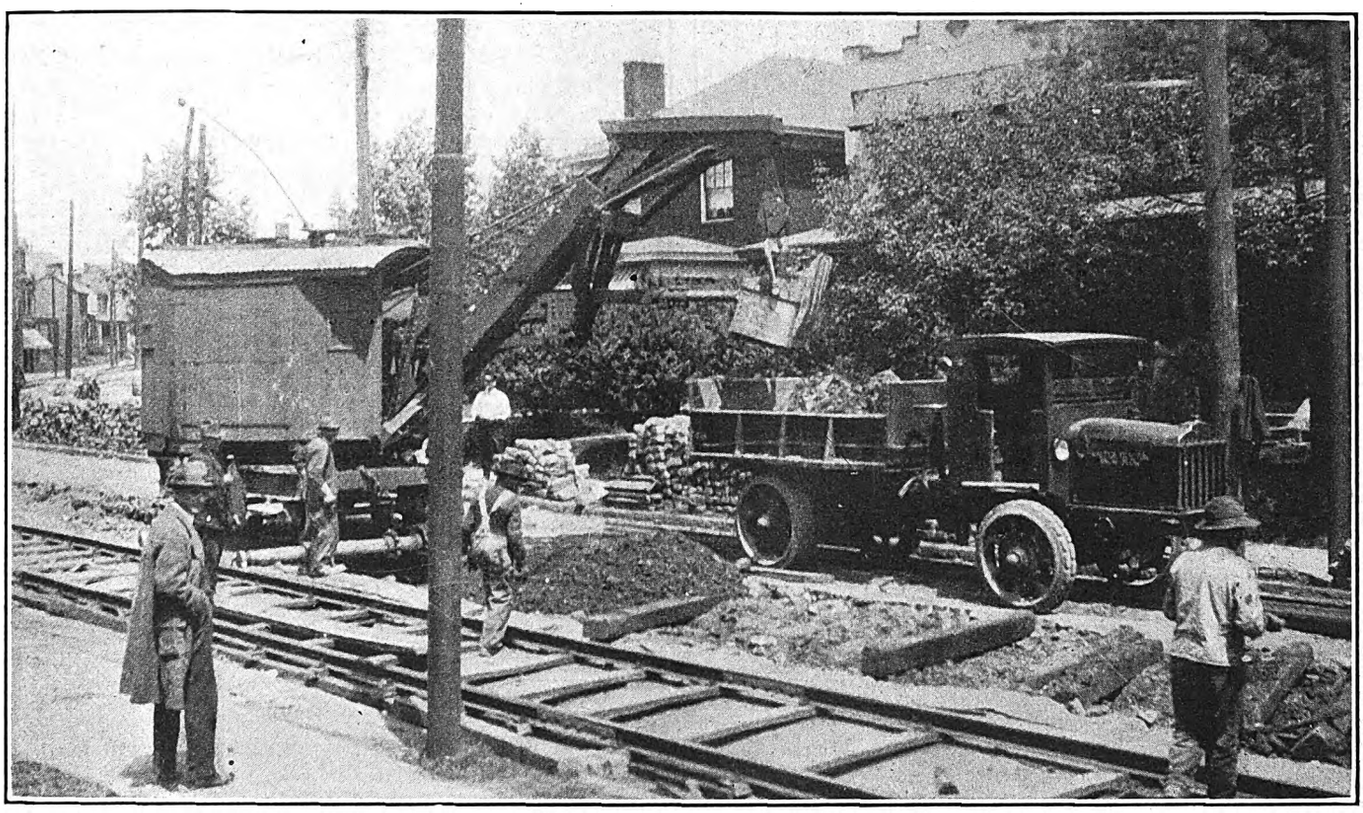
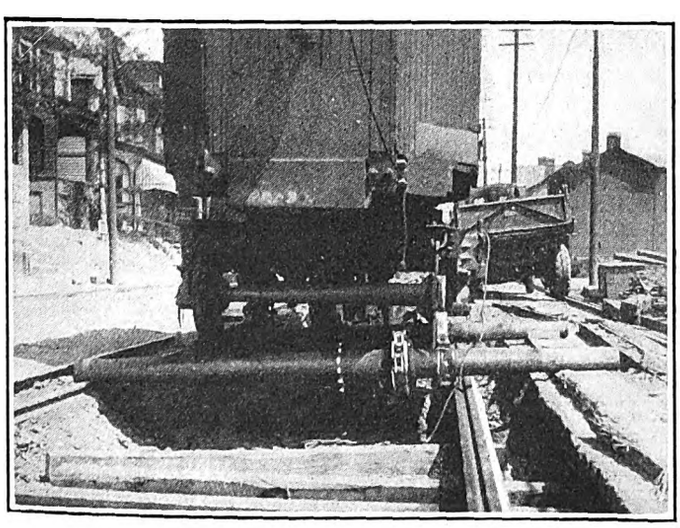


Pittsburgh Railways Uses Only Motor Trucks for Removing Excavated Material

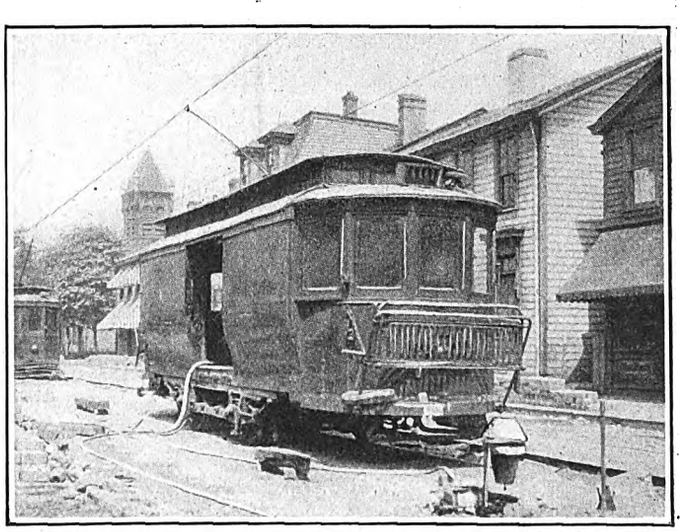
Mobile Equipment Used for Building Track in Pittsburgh

Extensive Reconstruction Work Done During Past Year — All Material Is Hauled by Motor Truck — Track Machinery Is Mounted on Service Cars or Equipped with Flanged Wheels for Movement by Rail

WHEN the present management took over the operation of the Pittsburgh Railways, slightly more than a year ago, the problem of track reconstruction was pressing. During six years of receivership comparatively little reconstruction work had been done. Of the 600 miles of track in the system, some 200 miles was in serious need of attention. With the completion of this year's program about 40 miles of track will have been entirely rebuilt. Extensive work has been done on the remaining track to put it in good operating condition. This maintenance is expected to meet the needs of the situation until the company is



Chain-Driven Rollers Give Mobility to Electric Shovel. Note the Supplementary Rail



Service Car Provides the Compressed Air and Gasoline Mixture Used to Heat Welding Molds

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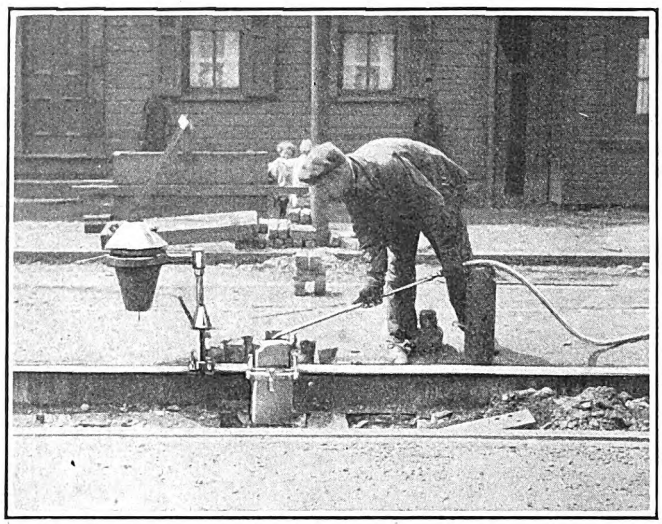
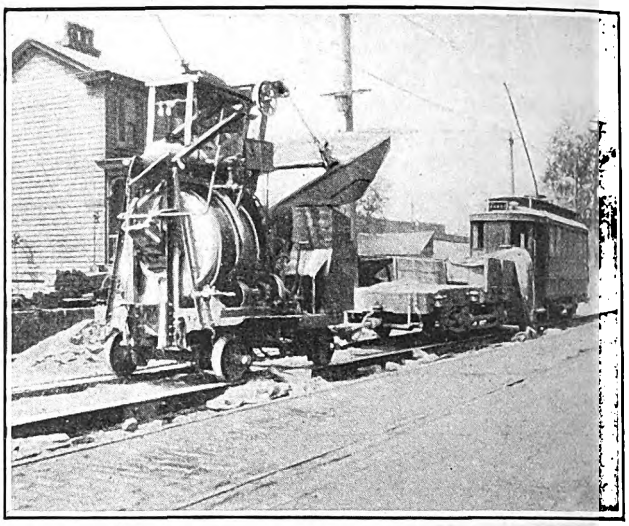


Preheating the Mold for a Thermit Weld. A Mixture of Gasoline and Compressed Air Is Carried Through Rubber Hose



Concrete Train Showing the Flat Car on Which the Cement Is Carried. Sand and Stones Are Delivered by Motor Truck

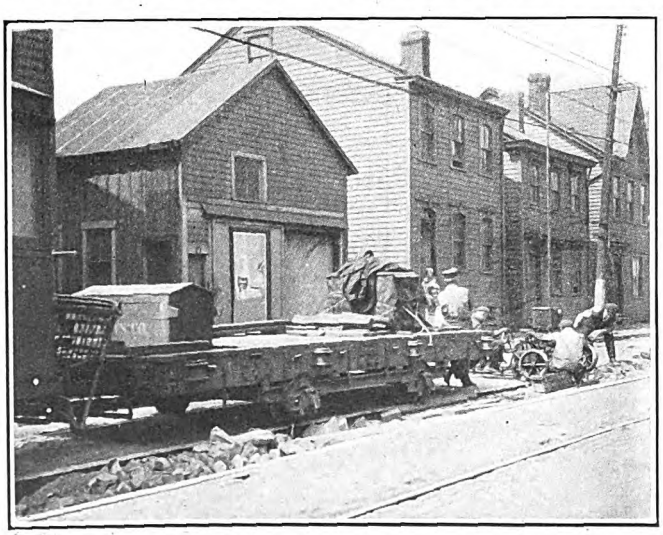
able to undertake the rebuilding of all track that is worn sufficiently to require replacement.

Much labor saving machinery is used by this company in its track reconstruction work. Electric shovels are employed to tear up the old pavement and foundations. These shovels have been especially equipped with chain-driven rollers to give them mobility. In streets where the railway has double track one track only is taken up at a time. An extra rail, as shown in the accompanying illustration, is laid on the inside ends of the ties of the track which remains undisturbed. Planks are laid end to end on the solid pavement on the curb side of the street. Rollers for the electric shovel extend from the extra rail to the planks and permit easy movement of the apparatus. This arrangement of supporting the machinery independently of the roadbed has been found to be very satisfactory. When only one track exists in the street, a temporary track, as shown in the accompanying illustration, is laid near the curb and cars are operated over this during construction work. Under such circumstances the shovels are moved on two rows of planks instead of using the rail fastened to the ends of the ties. A short length of old rail laid on its side is used as a wedge under the roller.

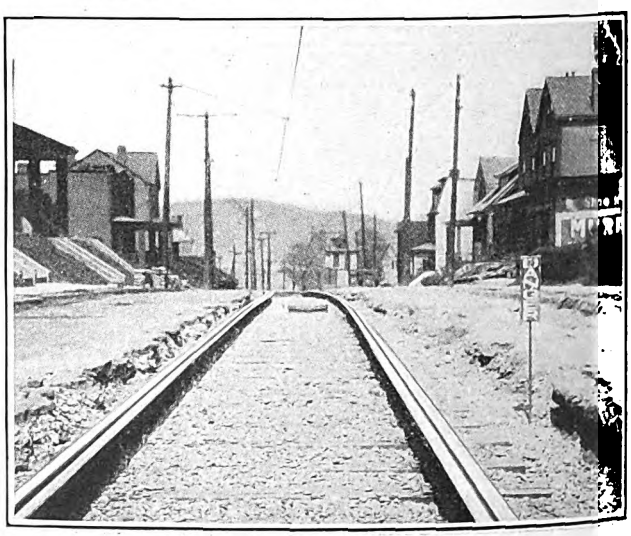
Material excavated by the steam shovel is hauled away by motor trucks, the use of service cars for this work having been practically discontinued. It is thought that fewer interruptions to passenger service are likely to occur if the tracks are kept free of work cars. Strong efforts have been made by the company to eliminate vehicular interference with car operation, and it felt that it would be inconsistent to permit such interference by work cars. Motor trucks also have greater flexibility of movement and material can be disposed in locations not accessible to the cars. New material for the work is brought by motor truck also. An exception to this, however, is made in the case of rail, which is transported by a special rail-carrying car of unusual length. This is simply a framework supported on two trucks and capable of carrying sixteen rails.

Recently a change to round gravel ballast has been made by the railway. Previously broken stones were used and, later, slag. The gravel, however, is available in large quantities at a low price from local contractors, who dig it up from the beds of nearby rivers. While it is not considered to be quite as satisfactory as the broken stone on account of its having rounded edges instead of sharp corners, it is considerably cheaper and it serves the purpose satisfactorily.

Wood ties are used and A.E.R.E.A. standard 9-in. grooved girder rail. After the gravel ballast has been thoroughly tamped a shallow layer of concrete is poured



Welded Joints Are Ground Smooth with a Rotary Grinder Which Is Carried on a Flat Car



Gravel Secured from the Nearby Rivers Is Now Being Used Extensively by Pittsburgh Railways as Ballast

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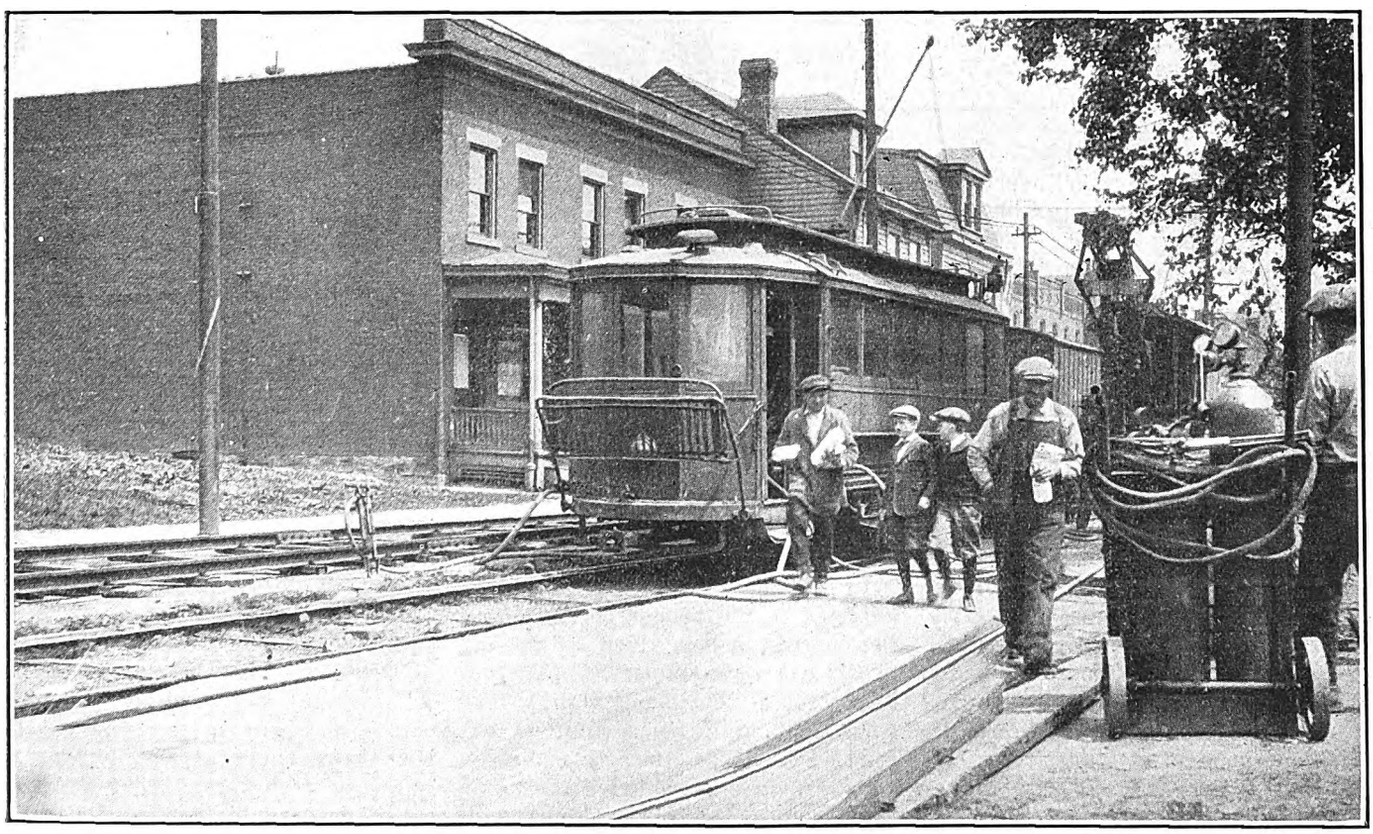
covering the tops of the ties and forming a foundation for the pavement. Instead of being done by the company, as used to be the case, paving work is done by the municipal authorities under the new franchise arrangement which is in effect throughout most of the territory served by the railway.

All rail is thermit welded. Apparatus for preheating the molds and rail is carried in a service car. A mixture of gasoline and compressed air is made in the car and carried through rubber hose to the welding mold as shown in the accompanying illustration. A burner is attached to the end of the hose and adjusted to position for heating. It is allowed to remain in this position, burning for as long a time as may be necessary to preheat properly. Two such burners and hose are carried on the car.

Apparatus for supplying compressed air to the pneumatic pavement breakers and tamping machines has also been mounted on a service car. A Chicago Pneumatic company air compressor has been placed in the body of an old passenger car and outlets on the side of the car are provided for connecting the hose as shown in an accompanying illustration. The capacity is sufficient to operate simultaneously four pavement breakers or eight tampers.



Pneumatic Pavement Breakers and Tamping Machines Are Supplied with Air from a Compressor Mounted in a Service Car

Concrete Mixer Has Flanged Wheels

Flanged wheels are provided on the concrete mixer so that it, too, forms a part of the work train. Coupled to it is a flat car carrying the cement. At one time it was the practice to carry also the broken stone and sand for the concrete mixture on this flat car. More recently, however, this practice has been changed and now only cement is carried. Sand and stone are transported by motor truck and dumped in the street near the work. Cement, however, being subject to deterioration from the weather, cannot be distributed in this way and permitted to remain exposed.

After the thermit welds have been completed they are smoothed down by a rotary grinder. This grinder is transported from place to place on a flat car, skids being provided by which it is rolled off and on the car.

New Type Track Pavement Tried in Rochester

COMBINATION asphalt and brick paving is being tried by the way and structures department of the New York State Railways, which is completing the work which was started on Goodman Street, Rochester, last year. This improvement extends from the end of the brick pavement at Fernwood Avenue northward to the new loop which was constructed last year near Norton Street.

The old track was laid in 1907, using 9 in. groove rail, wood ties and gravel ballast. The track was never paved and earth coming up to the top of the rail caused a very muddy condition in rainy weather.

The new construction consists of the railway's standard type of construction, 7 in. high T rail being used with wood ties and bar joints. The joints are of the eight hole standard, with 1 in. drive fit bolts and an Abbott plate underneath the rail. A feature of the construction is the type of pavement used which consists of asphalt between the rails but with a brick header laid on either side of the rail. This is the first time this type of pavement has been used in the car tracks in Rochester, and if it proves successful it is stated that similar pavement may be used in the future, as it is less expensive to construct than ordinary brick pavement and is more quiet.

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Equipment Maintenance Notes

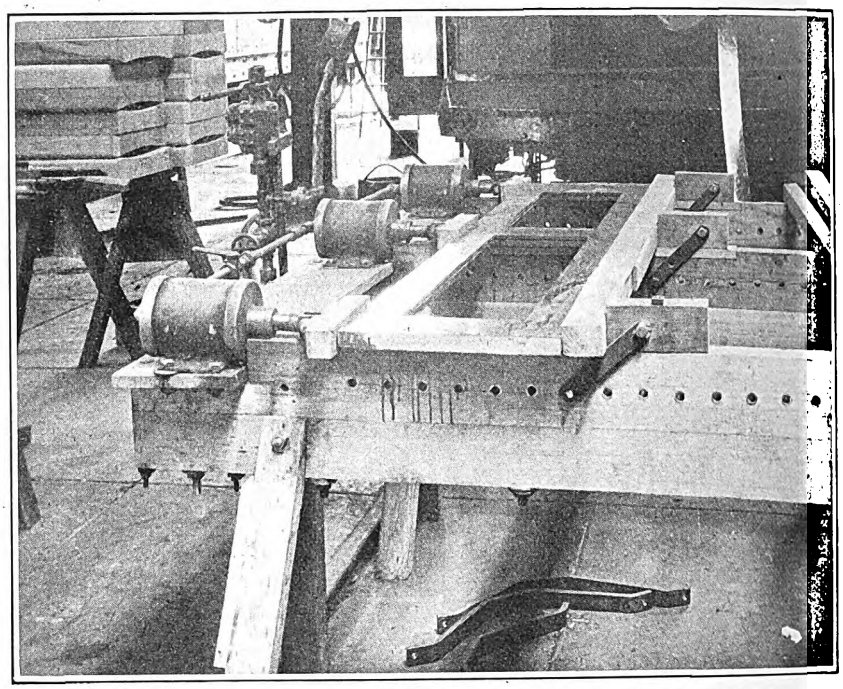
Pneumatic Mortising Clamp

BY J. L. BROWN
Master Mechanic Dallas Railway,
Dallas, Tex.

HAND clamps or wedges for holding doors or sash while gluing up mortises are widely used. At best, however, these customary methods are slow and take a great deal of time for a comparatively simple operation. Study of this subject in the shops of the Dallas Railway led to the development of the pneumatic clamping device shown in the accompanying illustration.

Three small air cylinders are fitted to a common supply pipe from the shop compressed air line. An ordinary engineer's valve admits air to the cylinders, and an adjustment valve below regulates the total pressure that can be applied. Each piston is fitted with a wooden shoe on the end, which presses against the edge of the door or sash to be glued up.

As is shown in the illustration, the entire device is mounted on a special table. Each of the air cylinders is fastened at the end of one of the cross-members of this table. These members are bored with a number of equally spaced holes, so that the spacing blocks shown in the illustration can be moved to any desired position to fit a particular size of work. These blocks are held in position by bolts through the holes in the table cross-members.



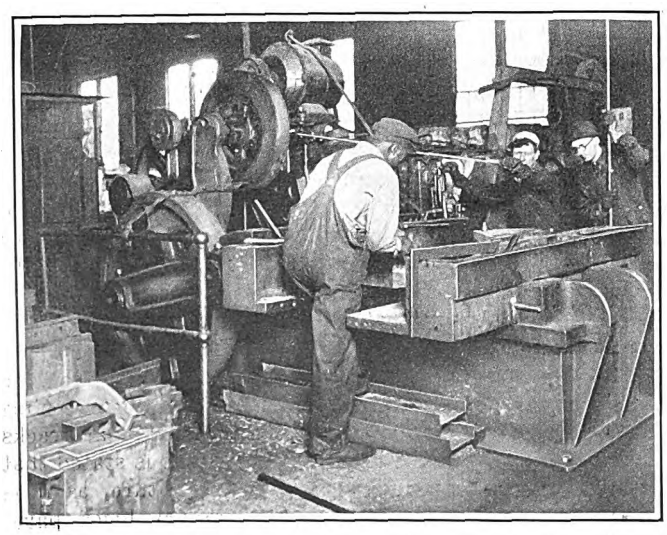
Pneumatic Clamp for Holding Doors or Sash While Gluing Mortises

This pneumatic mortising clamp in the shops of the Dallas Railway reduces the time for gluing up doors or sash. The three small pneumatic cylinders are connected to the shop air supply line, and the wooden shoes on the ends of the pistons bear against the edge of the door or sash under construction.

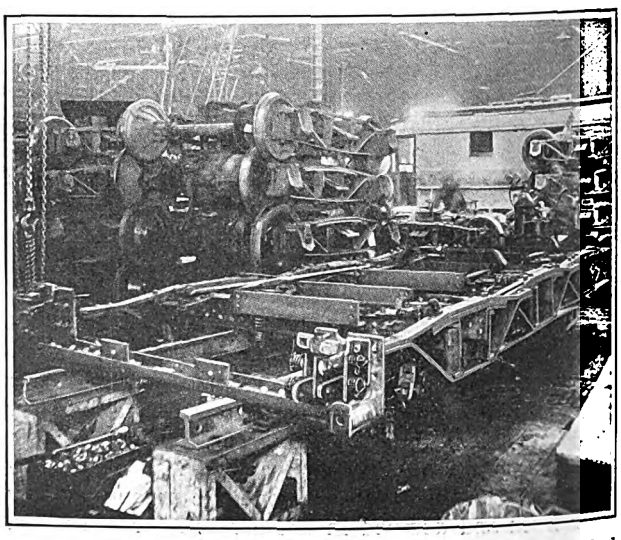
In practice, the spacing blocks are adjusted to the proper position, and the door or sash is glued up and set in place on the table. Application of air forces the tenons tightly into place. When a tight joint is encountered a blow with a mallet is usually sufficient to drive the joint home under the air pressure and provide a close fit.

Making Truck Parts in Bulldozing Machine

FOR some time past an extensive program of making arch-bar trucks has been in progress at the Homewood shops of the Pittsburgh Railways. The standard truck now being used under low-level cars is known as the M-25. This supersedes



Bending Truck Parts to Shape in a Bulldozing Machine in the Homewood Shops of the Pittsburgh Railways



Trucks of This Type Are Built in the Railway Shop, Standard Structural Shapes Being Used Wherever Possible

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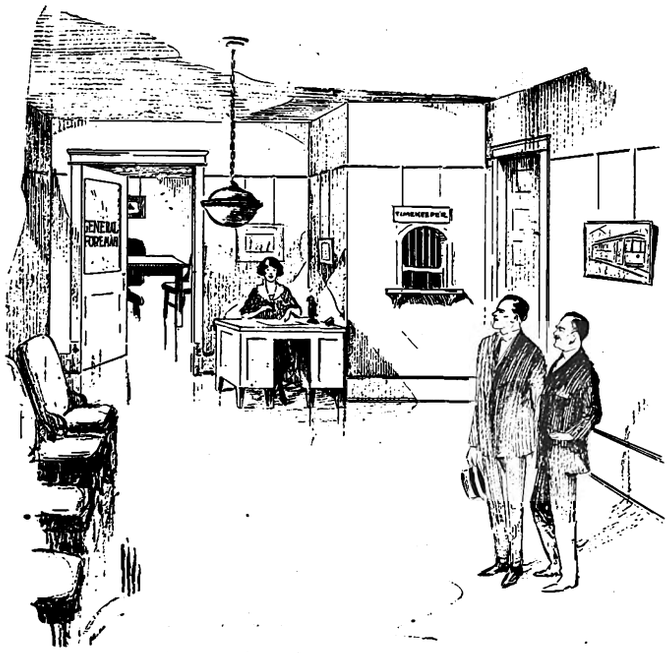
Dick Prescott Returns Home

And Sees Evidence of Changes



ONCE more Dick Prescott and Steve White, engineer of equipment and carpenter foreman of the Consolidated Railway & Light Company, found themselves waiting just outside the little office of Thomas Mullaney, general foreman. They had reported early on the morning following the return from their trip of inspection, and arrived a few minutes before Mullaney.

As they were waiting to report to their chief before resuming their regular duties, Dick and Steve were conscious that a decided change had taken place in the atmosphere of the little office during their comparatively brief absence. The sullen-faced youth who formerly occupied the desk at the little window under the word "Timekeeper" had been displaced by a comely young woman who extended a cheery "good morning" as she passed Dick and Steve on the way to her post.

Back in the office beyond the partition that separated it from the "reception room" outside several other new faces were visible. Even the neatly painted sign on the door was new. Both Dick and Steve were quick to feel the cordial invitation it extended in comparison with the former challenge of the word "office."

A fresh coat of paint had been given the interior of the room, and the long bench along one wall had been replaced by a number of serviceable but comfortable chairs. Thomas Mullaney's small office, of which the door stood open, also presented a rejuvenated appearance. The old battered roll-top desk, usually crammed with the papers accumulated from an imperfect filing system, had given way to a flat table whose clear-swept top gave an impression of being "stripped for action." Linoleum of a neutral shade covered the floor, and several office chairs were grouped about in a fashion that indicated the stage setting for a conference instead of the long customary solitary interviews "on the carpet."

"Gee," said Dick, when he and Steve had taken in the changed appearance and tone of the office, "this place is beginning to look like a real business establishment."

"I should say so," replied Steve. "If it weren't for Jack and Bill in there, I'd begin to think we were still on our trip. This sure is some improvement. Begins to look like the old man's started already to pep things up."

"He certainly is on the right track. I'll never forget the first impression I got when I came in here looking for a job. If I hadn't needed one so darn bad I don't believe I'd ever have gone through with it."

"I can understand how you felt about it, all right. But some of us fellows that have been sawing wood for eight or ten years had got to where we never expected anything much better. I certainly can imagine what some of the old gang are saying about this change in conditions. Some of them, I'm afraid, are not going to keep in step and will be in for a rather uncomfortable time."

"It's always hard to pull out of a rut when you've let yourself get into one. However, if we can make the gang see that a railway shop can do better work if it's run like any other up-to-date business establishment, and all pull together, we ought to be able to get under way without many casualties."

"I wish some of the other fellows could make a trip like this one we've just finished. Seeing how the other fellow does it certainly helps to make you realize that there are several ways of doing a job, and that the old way isn't the best, just because you've been following it for twenty years."

Dick and Steve were so intent on their discussion that both were a little startled as Thomas Mullaney himself opened the outer door and stepped into the reception room.

an older type known as the M-24. All trucks for new cars are supplied by the manufacturer, but the railway itself is building the trucks of M-25 type as they are needed to replace worn-out M-24 trucks. New trucks are built in the shop also to equip the motorized trail cars, of which a number have already been placed in service and more are planned.

In making trucks, standard structural steel shapes are used wherever possible to avoid the necessity to make forgings. Drilling is done by jigs. Practically all the truck members are bent to shape in the bulldozing machine. This process is shown in an accompanying illustration. A large oil furnace alongside the machine first heats the parts. They are then placed on the table of the bulldozing machine and bent to shape by means of dies. Present production capacity is two trucks per day.

Safety Treads Prolong Life of Car Floor

EXPERIENCE of the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., indicated some time ago that the platform floors on its safety cars were wearing out more rapidly than the floors elsewhere throughout the car. This was accounted for by the fact that the platform floors were of pine, whereas maple was used in the car body. The latter type of flooring had a life of five or six years, whereas the platform floors were wearing out in 1½ to two years. To remedy this situation, cast-steel safety tread has been installed on the platforms. Three pieces are used, one immediately inside the door, one in the middle of the platform, and a smaller piece in front of the motorman's seat. It is expected that with this arrangement the plaform floors will outlast the maple flooring in the body of the car.

Wall Rack for Controller Drums

AS THE space for overhauling controllers is quite limited in the 155th Street shop of the Eighth Avenue Railroad, New York City, wall racks for holding controller drums have been found particularly advantageous. These are constructed of wood with notches into which the ends of the shafts rest, and they reach entirely to the top of the side wall. An iron ladder is used to place

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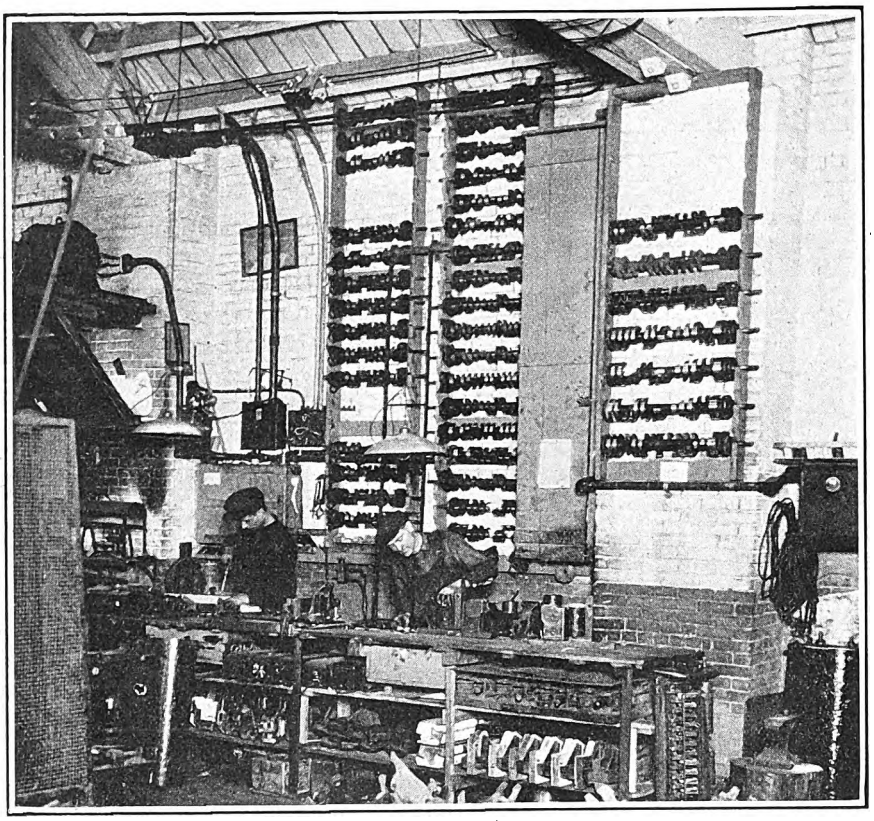


Overhauling Bench of Eighth Avenue Railway, New York, with Rack for Controller Drums Against Wall in Rear

and remove drums from the upper parts of the rack. With this arrangement storage space for approximately 50 drums has been provided directly behind the controller overhauling bench.

Small parts used in the overhauling of controllers are kept in a closet at the back of the bench. With an arrangement of shelves properly labeled, much time is saved in this overhauling work.

Transfer Table Used for Removing Trucks

FOR removing a truck from under a car body in the repair shop a transfer table is used in the Homewood shops of the Pittsburgh Railways. This transfer table operates across the end of several tracks in the machine shop. The car requiring repair is run onto one of these tracks and stopped with the truck on the transfer table. The car body is then lifted up by means of two Sprague 2-ton hoists hooked under the frame, as shown in the accompanying illustration. After the car body has been raised the transfer table is moved out, bringing the truck with it. The latter is taken over to a repair track and pushed off the transfer table. By a reversal of this process the truck is returned to its position under the car.

One Motor Arranged to Do Three Jobs

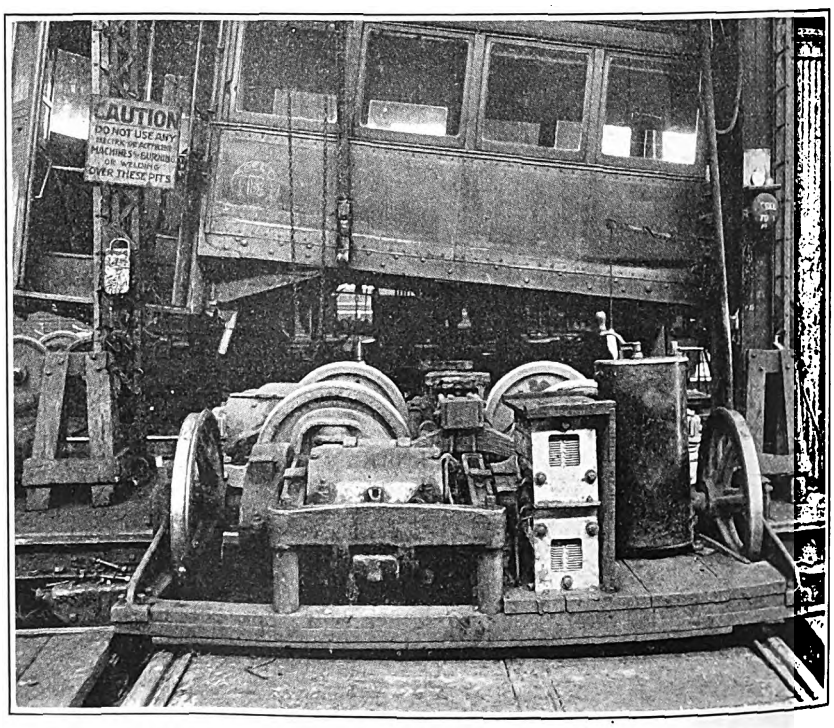
TO UTILIZE advantageously the spare time of a motor designed for track grinding work, the Poughkeepsie & Wappingers Falls Railway, Poughkeepsie, N. Y., has arranged a bench to which the motor may be bolted for shop work. In this position, it is in line with the shaft driving pulley and in an emergency can be used to supply power to the main shafting. It has been equipped also to be connected to a Westinghouse commutator slotter and can be thus used on many occasions when there is no track grinding to be done.

Relining Compressor Cylinders

CAST-IRON sleeves are used by the Dallas Railway for relining compressor cylinders. A self-aligning vertical boring mill, made by the Storm Manufacturing Company of Minneapolis, is used for boring out the worn cylinders so that a sleeve can be pressed into place. The amount of material removed depends on the thickness of the compressor cylinder walls. As an average, about ½ in. diameter is removed to provide for pressing in the bushings. This permits the use of a sleeve with a finished wall thickness of ¼ in.

Sleeves are purchased as rough castings from a local foundry. When received they have walls about 1 in. thick. These are first finish-turned to the proper diameter on the outside, about 0.004 in. being allowed for press fit.

After the sleeves are pressed into the cylinders they are bored out on the inside to the proper diameter. When the outside is turned a small shoulder is left at one end, to serve as a stop when the sleeve is pressed into place.



Electric Hoists Raise the Car Body and the Transfer Table Removes the Truck

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New Equipment Available

Improved Line of Band Saws

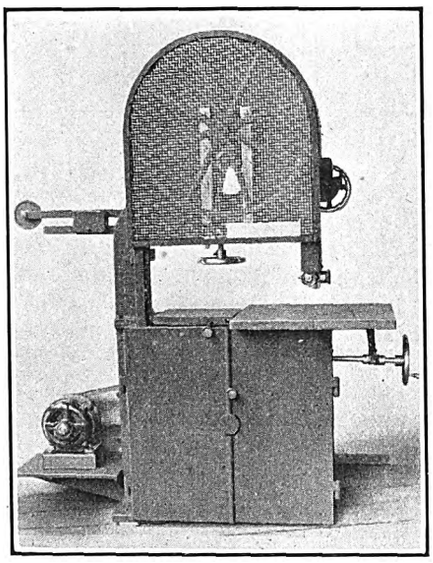
SEVERAL improvements have been incorporated in a new line of band saws by the American Saw Mill Machinery Company, Hackettstown, N. J. These machines are designed particularly for convenience in operation and include safety guards protecting every point of contact with the saw except the actual cutting space. The line includes sizes ranging from 20 in. to 36 in. Either motor or belt drive may be used.

The upper and lower wheels of the 30-in. size are of the spoked type, with a 30-in. diameter and a 2-in. face. The lower wheel is inclosed in a compartment with iron doors, or it may be covered by wire mesh doors similar to that which covers the front side of the upper wheel. The machines are furnished with only the front or door guards, the space back of the wheel being left open. In an optional design the lower wheel can be equipped with a special brake attached to the bolt shifter to stop rotation of the wheel quickly. Both wheels are keyed to ground steel shafts. The collar is forged solid on each shaft. The hub of the wheel is firmly held against it by a large nut. Both the top and bottom shafts run in extra long bearings, which are made in two parts to take up wear. These are adjustable to provide for alignment of the saw blades. The upper wheel bearing is hinged for tilting of the wheels by means of a lever located in a position convenient for the operator.

A special anti-friction saw guide is provided. This is mounted on a counterbalanced square post, and a hand wheel is used for raising and lowering the guide post so that the workman may devote his entire attention to the work. The slide head which carries the upper wheel bearing slides in a groove in a column and is held in place by steel gibs.

The table for the saw is 20 in. x 20 in. x 32 in. It is made rigid by extensive ribbing on the under side. A hand wheel and screw are provided for tilting the table to 25 deg. for bevel sawing, and a brass index registers the angle.

Where motor drive is used, a 2 to 3-hp. motor is recommended. The



Motor-Driven Band Saw with Special Protection Safety Guards

2-hp. size is sufficient for ordinary shop work, but the 3-hp. is preferable for heavy work. The design is such that the motor can be set on the floor and bolted to a pulley drive or set on a special bracket attached to the body of the machine and provided with a gear drive.

Light Bus Chassis

STUDEBAKER has just put into production two bus chassis in which the outstanding features claimed will be low initial cost, economy in operation, dependability under hard usage and passenger car comfort. Two sizes, each with the same unit 75-hp. engine, are being presented. Model A-158 has a wheelbase of 158 in.; Model M-184, a wheelbase of 184 in.

Low cost of operation comes from the experience of the thousand and upward Big Six chassis to which bus bodies have been fitted. Many of them have run from 100,000 to 300,000 miles.

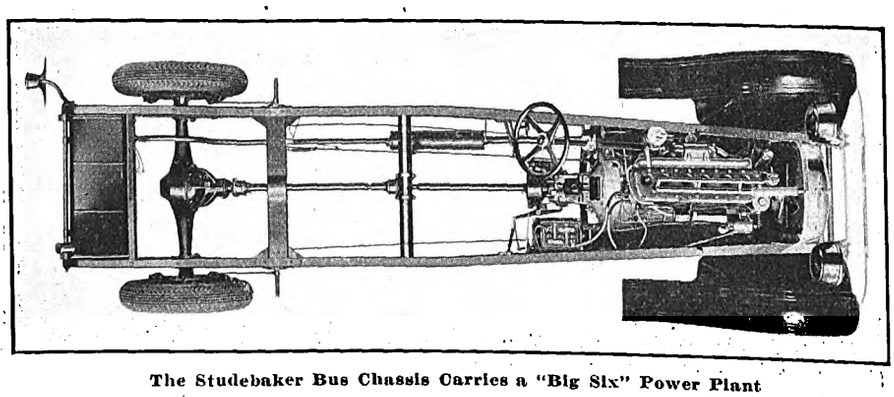
The Big Six 75-hp. engine is used. This is a unit power plant, with single-plate dry disk clutch, set in its own subframe to eliminate road torsions. It is of the L-head type, cast en bloc with removable head, bore 3⅜ in., stroke 5 in.

The carburetor is 1½ in., double jet, two range, specially designed for the Big Six engine. Spark advance is automatic, timed by the engine itself. All electric wiring is in metal conduit and the whole ignition system is water-proofed.

The semi-floating rear axle is housed in truss construction with one removable plate to admit directly to the differential. The axle shaft diameter is 2⅛ in. Springs are semi-ellipic, 2 in. wide. The front springs are 38 in. long, those at the rear 56 in. long. Fenders (on the front only) are of 19 gage pressed steel, doubly crowned and concentric to the steel disk wheels, which carry tires 34 x 7.3 in. in size, six ply. Dual rear wheels and tires are optional on the M-184 chassis.

Service brakes are the Studebaker hydraulics on four wheels. Hydraulic equipment is at the rear of the transmission case, where two opposed cylinders, actuated by a force pump, impart a 60-40 proportioned force of 200 lb. on rear and front wheels, respectively. The pump is driven by the propeller shaft. The emergency brake works with the direct pull of a latching pistol grip projecting from under the center of the instrument board.

The frame has side members 7 1/16 in. deep, of ⅛-in. steel, with 2½-in. flanges on the Model A-158. On the Model M-184, the flanges are 3 in. wide and the channel is 8 in. deep at the center with a 4½-in. channel beam running 40 in. beyond the rear axle. On the Model A-158 the seven regular frame cross-members are



The Studebaker Bus Chassis Carries a "Big Six" Power Plant

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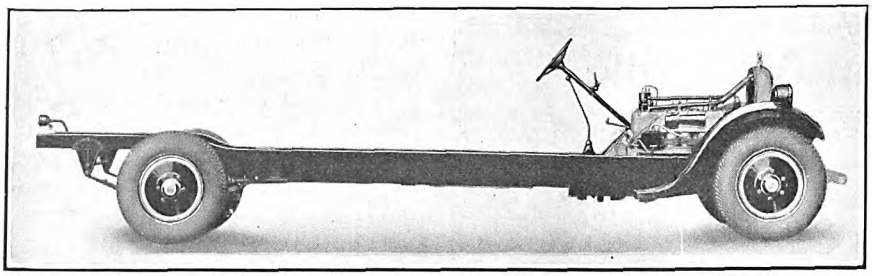


The M-184 Chassis Is Suitable for 15 to 20-Passenger Bodies

supplemented by a 3½-in. tubular cross-member. On the longer model, this supplemental bracing consists of two 3½-in. tubular cross-members in the center and an additional 2½-in. tubular cross-member at the rear.

The propeller shaft is in two sections with center ball-bearing steady rest, and two Spicer universal joints. The gear ratio on both models is 4.7 to 1.

Model A-158 is suitable for twelve to fifteen passengers, and model M-184 for fifteen to twenty passengers.

Concrete Pole Design Reduces Maintenance

A DESIGN of concrete pole to meet the demand for longer life, greater strength and increased safety factors in trolley and transmission lines has been incorporated in the Hollowspun concrete poles manufactured by the Westinghouse Electric & Manufacturing Company.

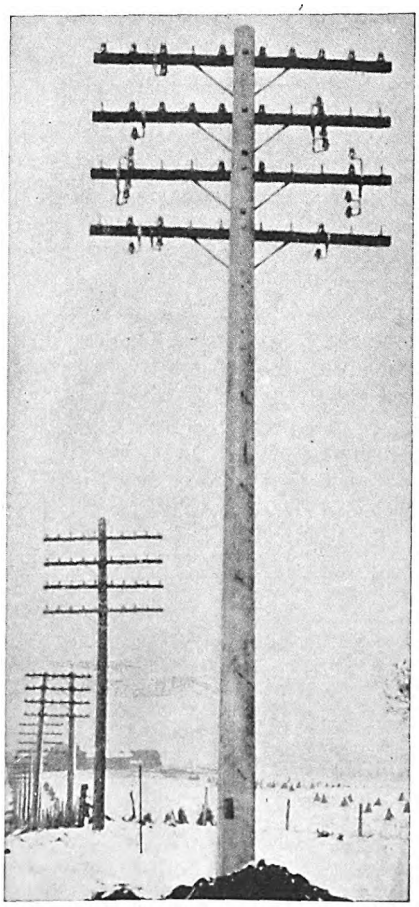
Hollowspun poles are built by a centrifugal process and are free from electrolytic corrosion due to the density of the concrete. Reinforced concrete pole construction requires a relatively high percentage of tensile and shear reinforcement. In order to obtain this, the section of the individual rods must be kept down and these are then given some additional horizontal wrapping to insure against shear failure. The resulting mass of reinforcement commonly called a cage is so dense that it is not possible to force concrete into place by spading or tamping.

In the Hollowspun process, the reinforcing steel, after being accurately computed for the particular class of pole to be made, is held rigidly in place. The complete reinforcing cage is then placed in a horizontal form and held at the desired distance from the surface of the form by concrete buttons which become part of the finished wall of the pole.

Concrete is added and the entire form rotated at high speed, developing centrifugal force sufficient to compact the concrete into a very dense wall, leaving a cylindrical opening in the center running through the length of the pole.

Removable steps may be made for these concrete poles by embedding bronze inserts in the concrete and using these as inserts for holding the ordinary pole steps. Standard crossarms and other equipment now in use can also be applied to these Hollowspun poles.

The use of these concrete poles for transmission lines makes possible a considerable increase in the capacity of the lines, and thus permits the reduction of the number of poles per mile, or an increase in the number of wires without reducing the factor of safety. Maintenance costs are practically eliminated by the use of these concrete poles.

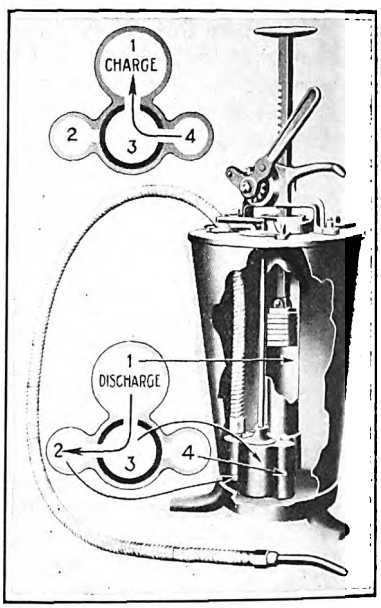


Hollowspun Telephone Poles in Service Under Severe Weather Conditions

Bucket Pump Removes and Applies Grease

A GREASE bucket with hand-operated grease gun incorporated has been brought out by the Manley Manufacturing Company, York, Pa. It has a capacity of 30 lb. of grease or oil and is self-measuring, since one complete stroke of the pump discharges 1 lb. of lubricant. Two methods of operating the equipment are provided—by direct pressure on the handle, or by a ratchet lever with an 8 to 1 ratio.

The three-way construction shown



The Three-Way Construction of the Pump Mechanism Permits It to Be Used Either to Force Clean Grease in or Remove Old Grease

in the illustration permits the device to be used as a syringe, to remove dirty grease, as well as for a pump, to put in clean grease. As indicated, No. 1 is the main cylinder; No. 2, a discharge port leading to the hose; No. 3, a three-way cage valve, and No. 4, the suction port leading to the contents of the bucket.

Grease or oil is sucked into the cylinder (where arrow is pointing) by the drawing up of the piston. The next step is to move the lever at the top of the bucket 90 deg. to the right, when the ports are in the position shown in the lower insert. Pushing down the piston forces the grease out of the cylinder and through the hose into the grease chamber of the equipment to be lubricated.

With the ports in position as shown in the lower insert, the old grease can be sucked into the pump cylinder and discharged into a waste pan without changing ports.

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Association News & Discussions

Canadians Discuss Car Design and Ride Merchandising

Annual Meeting, Held at Montreal Last Week, Best Attended in History of Canadian Electric Railway Association—Lively Discussion Brings Out Many Points on Merchandising Transportation and One-Man Cars for City Service

FOR the second time the Canadian Electric Railway Association has held a joint convention with the Canadian Electrical Association. Unlike many joint conventions, the common features included only the exhibits and entertainment features. Each association held its own sessions, so that the full program for each group was devoted to live subjects.

Railway sessions were held on June 10, 11 and 12, with D. E. Blair, general superintendent Montreal Tramways and president of the Canadian Electric Railway Association, presiding. Much interest was manifested in the paper by Walter Jackson entitled "The Business of Selling Rides." The paper is abstracted elsewhere in this issue. In presenting his paper Mr. Jackson pointed out that the management should use every way possible for making the company and its service popular. While he has been hailed as the proponent of the weekly pass, he feels that this has value not so much in itself as in being part of a plan for popularizing the railway.

Railway Business Now Selling Rides

A lively discussion followed the presentation of Mr. Jackson's paper. E. M. Walker, president Schenectady Railway, pointed out that with the automobile a big factor in local transportation, the business of the railway is now largely one of selling rides. Success in this line depends to a considerable extent on the removal of all sources of irritation. Among other things, he mentioned transfers that are easy to issue, inspect and check. As another instance, he spoke of one road where 7-cent tokens are sold. These are dispensed in envelopes containing seven tokens and one cent. The amount, 50 cents, is marked plainly on the envelope, so that the sale is made without the necessity of the conductor handling change or the tokens.

H. E. Weyman, manager Levis Tramways, stated that in his territory he arouses interest in the sale of weekly passes by giving away a pass each week to the holder of the lucky number in a drawing.

D. W. Harvey, manager Toronto Transportation Commission, told of the use of posters in Toronto for advertising the local museum. He stated that a large increase in riding to that point was a result. He felt that where the riding habit is as high as it is in Toronto, namely 365, it is dangerous to make changes in the rate of fare. Mr. Jackson replied that there really is no limit to the riding habit so long as people may be found on the sidewalks.

Motor Buses Discussed

The report of the motor bus and truck committee was presented by I. S. Fairty, solicitor Toronto Transportation Commission, in the absence of Chairman F. D. Burpee. This report will be abstracted in a future issue of ELECTRIC RAILWAY JOURNAL. Discussing the report, Mr. Fairty said that he thought the cost of transportation was a matter of no great concern to users of private motor cars. He felt, therefore, that the street car man must sell his rides on the basis of service rather than cost.

L. H. Palmer, vice-president and general manager United Railways & Electric Company of Baltimore, described the special bus trips and tours he is running in Baltimore. He stated that these trips provide a new field of revenue for street railways that have gone into the bus and coach business. In Baltimore he finds that this form of transportation is growing. On May 30, for instance, the company obtained a total revenue from this source of $2,200. Tours were run to Atlantic City, which included hotel accommodations and all ordinary expenses. Mr. Palmer expects to run regular service to Gettysburg in the near future. Tours of this sort, he feels, should make better salesmen of the electric railway men. Asked regarding competition, he said that his company bought out a competing bus company. He expects competition, and his intention is to combat it by giving better service. Mr. Harvey stated that in Toronto he is planning motor coach tours along similar lines to those being used by Mr. Palmer.

Gordon Lee, Fageol Motors Company, said that undoubtedly improvements in motor bus design can be anticipated, now that the manufacturers are studying it from an operating standpoint. He stated that a gain of 2 miles per gallon in gasoline consumption may equal as much as the cost of the vehicle during its life. He also pointed out that the total taxation of motor vehicles today is not small and that no attempt to belittle it should be made.

The speaker held as his belief that buses will either be consolidated into large operating companies or else that the operation will be absorbed by the existing railway lines. Traffic, he felt, will come from users of automobiles rather than from the present railway riders.

Cars and Car Design

The influence of operation on car design was discussed in a paper by J. Metcalf, traffic department Toronto Transportation Commission. A companion paper on the development of the treadle exit one-man car, was read by W. R. McRae, superintendent of rolling stock Toronto Transportation Commission. Both these papers are abstracted elsewhere.

A lively discussion followed the presentation of these papers. Acton Burrows, *Canadian Railway & Marine World*, stated that he is a regular rider on the treadle cars and that he has found their operation exceedingly satisfactory. He feels that some education is necessary in order to get the passengers to use the rear door. W. R. Robertson, general superintendent Hydro-Electric Railways, Toronto, stated that he is using treadle door cars on his line with considerable success. The cost of treadles on a double-end car, he stated, was about $1,000. Mr. McRae stated that the cost of a single treadle installed was about $480, or $1,600 for the entire car.

Mr. Metcalf pointed out the difficulties with the original Birney car, due to the single door at the front for both entrance and exit. He thought that the use of the treadle is most important when the car is crowded. When but few passengers are on the car, it makes little difference whether they leave by the front or the rear. However, when there are many standing passengers in the aisle, it is more convenient for those at the rear to leave by the rear treadle door, so that its value is measured by the time saved during the rush hour, rather than by the total number of passengers who use it all day. He stated that in Toronto approximately 10,000 car-miles per day are being run with treadle cars at a schedule speed of approximately 10 m.p.h. At a rate of wages of 60 cents per hour, there is saving of some $250,000 per year on the 100 cars operated in this manner. Replying to a question as to the opportunity for passengers entering through the automatic door, he stated that only one case of this sort has been observed in Toronto.

C. L. Wilson, superintendent Hydro-Electric Railways, stated that he spent an entire afternoon trying to enter the car through the treadle door. He stated that he was able to do it only once, when a friend was getting off and where he was able to put his foot on the step before his friend had completely alighted. He thinks there is practically no chance of beating it.

There was some discussion as to the relative number of improvements in

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design that have been made by railway and bus manufacturers. The general opinion was that the railway manufacturers have done their full part in developing new mechanisms and practices. Mr. McRae thought that the greater number of improvements have come from the operating companies, but that the manufacturers have given full co-operation in working them out. Mr. Blair said that the manufacturers have done nobly in advising their customers and often have shown that various plans suggested were inadvisable, even though it meant a loss of business.

In reply to a question as to how the treadle door cars were backed, Mr. McRae stated that the operator remained at his post in the front of the car. There is a push button before him, which rings a bell at the rear end, giving warning to those in the path of the car that it is backing.

Officers Elected

Following the technical discussion, the nominating committee presented a list of names for officers for the ensuing year. These were elected unanimously, as follows:

Honorary President, Julian H. Smith, president Montreal Tramways.

Honorary Vice-President, Acton Burrows, proprietor *Canadian Railway & Marine World.*

Honorary Advisory Council: T. Ahearn, Ottawa; F. A. Gaby, Toronto; D. E. Galloway, Montreal; George Kidd, Vancouver.

President, W. S. Hart, treasurer Quebec Railway, Light & Power Company and vice-president Three Rivers Traction Company.

Vice-President, W. R. Robertson, general superintendent of railways, Hydro-Electric Power Commission of Ontario, Toronto.

Treasurer, E. P. Coleman, general manager Dominion Power & Transmission Company, Hamilton.

Auditor, L. Tait, manager and vice-president London Street Railway.

Executive Committee: The president, vice-president, treasurer, immediate past-president (D. E. Blair, Montreal), and T. W. Brackenreid, Port Arthur; F. D. Burpee, Ottawa; A. H. Foster, Brantford; G. Gordon Gale, Hull; D. W. Harvey, Toronto; D. W. Houston, Regina; L. Killam, Halifax; A. W. McLimont, Winnipeg; H. E. Weyman, Levis; C. L. Wilson, Toronto.

Following the election, Mr. Hart took the chair. In a brief address he stated that the Canadian association, while small, is exceedingly active and that much good has been obtained from its meetings. The chair then called on President J. N. Shannahan of the American Electric Railway Association, who was present. In a few well chosen remarks, Mr. Shannahan summed up the present railway situation. The smallness of the Canadian association, he said, does not count. The success of the association is measured by the work done by it and its members. Mr. Shannahan extended the facilities of New York headquarters to the Canadian association. He said that he wants to make the American association more helpful to all of the sectional associations as well. Mr. Storrs, he said, is at the service of all operators and is glad to do what he can for them.

This year the usual joint luncheons of the Canadian Electrical Association of the Canadian Electric Railway Association were held, but no speeches were made. The annual banquet, held at the Windsor Hotel on June 11, was well attended. There was but one speaker, President Shannahan. After bringing greetings from the American association, Mr. Shannahan said that each year for the past ten had seemed a difficult, in fact a critical, year in the electric railway industry. "This one," he said, "is no exception."

"The particular problem of greatest concern to us at this time is in convincing our municipal authorities that we are in reality not solely electric railway people, but urban transportation people, prepared for and desirous of giving the necessary service regardless of the vehicle or the method. We are seeking to convince them that it is not only in the interest of fair play, but in their own interest to have a service in which the electric car and the bus are co-ordinated under one management, rather than seeking to destroy each other in a competitive fight, in which the inevitable end is the ruin of one, if not of both. It seems to me that the far-seeing municipality is the one which, when besought to grant a franchise to a bus company bent on a competitive fight with the existing electric railway, sends for the owner of the railway and says to him, 'We desire a bus service in certain sections of our city to supplement and extend the service you are now giving us; if you are desirous of supplying this service we will agree upon fair and equitable terms of the necessary grant.'

"It is only when a utility is earning and paying its way that it can give a continuing and permanent service. Any utility service, efficiently and honestly managed, must be permitted to earn a rate of return high enough to induce the flow of capital necessary for extensions and betterments."

Mr. Shannahan told of the formation of the advisory council of the American association and the appointment of Mr. Storrs as managing director.

The Business of Selling Rides*

By Walter Jackson
Fare and Motor Bus Consultant,
Mount Vernon, N. Y.

SELLING rides is a comparatively new business on this side the water, although the expression "Selling transportation" has been heard for a number of years. However, the usual advocate of "selling transportation" meant the promotion of business through the improvement of public relations via better equipment, safer service, polite platform men, lost and found departments, general advertising of operating data and the like. He overlooked the fact that the flat-fare system was a real barrier to the sale of the ride.

In all lines of merchandising it is a basic principle that goods be sold at a lower rate when the buyer purchases in wholesale quantities, when he purchases at slack periods, when he pays in advance and when he purchases on other than a necessity basis.

Before our industry can call itself a business it must depart from the idea that every purchaser pay the same price per ride regardless of the number bought, the time of riding or the length of the trip. Voluntary traffic—the off-peak variety that we need above all else—can come only through the differentiation of rates of fare.

Difference Between Uneconomic and Profitable Differential Fares

I am, of course, aware that Canada is well acquainted with certain differential fares, such as the workmen's rates. Most of these, however, are based more or less on franchise obligations. Indeed, the workmen's rates are entirely wrong in principle. In some instances, also, there have been mid-day and Sunday reductions, but it does not seem that these concessions have been actively advertised. In any event, it cannot be said that there really is such a principle prevalent as "a wholesale rate for wholesale use." A person who buys, say, five tickets at a lower rate does not have to use up these tickets within any given period.

Great Britain has had short-haul fares from the beginning of tramways, while Australia has edged over to what it calls "section" fares after starting on the American flat-fare basis in some cities.

With the British system of zone fares I wish to call attention to the principle of charging according to the length of ride; also that the zones vary greatly according to the density of traffic and the location of traffic gathering points. You may get less than a mile for your penny downtown where customers are plentiful, but possibly 2 miles at the outer end of the route where customers are scarce. That's business.

The London County Council Tramways supplement their regular and workmen's rates by a mid-day fare which combines the principles of the zone and the flat fare. Under this plan, it is possible to secure for 2d. between say 10 a.m. and 4 p.m. a ride that might cost as much as 6d. at other hours of the day. This plan, so far as personal investigation showed, has been a financial success on a number of routes for the reason that the additional riders found plenty of room on the cars. This experience proved that a transportion system that really does try to meet the fluctuations of the daily load can undertake traffic-stimulation schemes like this with more chance of financial gain than a motor-bus system which neither meets the peak-hour conditions nor has high excess capacity.

Another plan of the London County Council Tramways, inaugurated early this year, is the sale on Saturdays and Sundays of a one-day shilling pass. Pittsburgh was a couple of months ahead of London with the Sunday-holiday pass at 25 cents. This pass

*Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

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is the second L.C.C. plan which the bus cannot follow safely because of its lesser capacity.

London—Leader in Ride Salesmanship

London, also, has the greatest ride-selling organization in the world—the great traffic combine which is made up of most of the underground railways, the London General Omnibus Company and several suburban tramways. There the art of selling the ride from the viewpoints of differentiated fares, shorter headways, faster equipment, passenger convenience and the appeal of the printed word and colored poster has been developed to a pitch that we can hardly hope to equal.

As the posters used in London will speak for themselves, I need only add that these and other activities of Lord Ashfield's aptly-named commercial department have been the inspiration for much of our work in the United States. The lure of these posters is backed by deeds. When Albert Stanley came to London the rule was long trains at long intervals. He converted them to short trains at short intervals. Fares were on a cumulative zone basis which made them too high to foster suburban development. He encouraged modifications that shaded the fare for the steady long-haul rider by means of season tickets and thus led to still further extensions of the rapid transit routes. Train speeds were sluggish. He sought untiringly for the best in control and signal equipment. Patrons found it hard to reach the stations and irksome to wait for trains far below ground. He introduced a wonderful variety of direction signs, arranged to have the lift stay on the reassuring street level until the coming of the train was signaled and, in other instances, provided moving stairways whose worth might be studied profitably by some of our own rapid transit and suburban transit organizations.

Ride-Selling Fares in America

Under the strain of the World War, the nickel fare and the less-than-a-nickel fare went to smash. Fare increases aroused much greater hostility than the ballooning of other items. Then, too, the personal automobile came along to reduce traffic—aside from the temporary jitney. The net result was that the car ride no longer was an indispensable article to very many.

At this date it is plain that much of the hostility could have been avoided if the railways had sought a more business-like solution than a flat increase in fare. The case of San Diego, for example, shows how much wiser it was to retain the popular 5-cent rate for the short rider at least. In this instance the company's revenues were increased by more than 30 per cent without losing any customers. So, also, at New Bedford the 5-cent fare was retained in principle but was now restricted to a ride between the town center and the suburbs.

In these installations, made immediately after the war, success was far greater and fare collection far more convenient than on the general run of properties with their 6, 7, 8 and 9-cent rates installed regardless of the length of ride. It is true that modifications in the form of ticket or token rates came along in time, but when we note one large company selling four tokens for 26 cents against a 7-cent cash fare we can appreciate that ride salesmanship and conductor-customer contacts have not received much consideration. There is something wrong with any fare system that calls for excessive change making, partly in causing waste of time and partly in emphasizing the expense of the ride.

On the Boston Elevated Railway the introduction of 5-cent short-haul fares, chiefly for the self-contained suburban towns, proved an excellent way of restoring the system to practically the same public usefulness as under the pre-war 5-cent universal fare. A few months ago these short-haul lines were raised to 6 cents, but inasmuch as the average ride on these lines is only 1½ miles it is not apparent that the change has proved fruitful.

Much credit is due to the Eastern Massachusetts Street Railway for recognition of the fact that a railway system covering an extensive urban and suburban territory cannot expect to get most revenue and most riders from a uniform fares plan. Although the casual rider pays 10 cents, the regular and semi-regular rider on some divisions enjoys as low a fare as 5 cents through the purchase of punch cards. To my mind this is a far more sensible plan than insisting that all fares should be alike throughout a large system. If there is a feeling that the local fares are higher than a self-contained policy would make them, the management must expect to stay in hot water most of the time and fail to get more revenue from more riders.

One of the most pertinent developments in short-haul fares is the 5-cent center to city boundary policy of the Public Service Railway of New Jersey. For some years following the zone fare trials, the company held fast to the old plan of a higher and higher flat fare with transfer charge regardless of length of ride. On the other hand, the jitneys which swarmed in all the Public Service towns used in most cases the simple but disastrously effective weapon of a non-transfer 5-cent fare between city center and boundary. They generously left to the railway those passengers who had to ride across town. Today the railway in absorbing the jitneys is also absorbing this fare plan to an ever-growing degree.

Lower Rates for Wholesale Users

In all of the fare plans described, and also in plans which grant some reduction for riding during the off-peak hours, there is one important omission—namely, the person who enjoys the lower rate is not necessarily a wholesale rider. It is, of course, all right to grant a reduction to any class of voluntary rider where a short-haul or off-peak condition is involved; but it is still better if such fares can be supplemented by a rate that rewards the consistent everyday patron of the service, both in lowering the cost of the ride and in making the process of fare collection more agreeable.

The latter thought is the basis of the unlimited-ride pass which is now in service in at least fifty communities. The idea of the pass was born directly from the conditions that are peculiar to the manufacture and use of mass transport mileage. During the few rush hours we have more passengers than seats—at least in one direction; and during the many non-rush hours we have more seats than passengers under any form of schedule yet devised. Some of these seats can be filled by short-haul, by mid-day, by shoppers and by theater rates; but the largest number will be filled if we can get every regular rush-hour patron to duplicate his rides for some voluntary object, as going home to lunch, going to entertainments oftener, paying more visits than before, etc.

It is sound salesmanship to make the customer forget the cost if we can. The pass reduces the spending transaction to once a week. By selling our transport in the convenient weekly package, we avoid the need of giving refunds in case the buyer finds he will not need all the purchase.

It is also sound salesmanship to make the purchaser feel that he is a bit better than somebody else. The rider with a pass does not have to stand in line for change, tickets or transfers. He flashes his badge of authority and passes on while the other riders are still at the fare box. More important than this is the privilege of boarding any car any time for any distance. He no longer rides just because he must; he also rides because he wants to.

Since the pass is intended to benefit the wholesale rider, the next question to consider is what the price should be. In general, we must get at least as much money as before, but in return we will give more of the service now

COMING MEETINGS OF *Electric Railway and Allied Associations*

June 22-26 — American Institute of Electrical Engineers, Saratoga Springs, N. Y.

June 26-27 — New York Electric Railway Association, Hotel Champlain, Bluff Point, Lake Champlain, N. Y.

July 17-18 — Mid-West Claim Agents' Association, Hotel Jefferson, St. Louis, Missouri.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

August 12—Metropolitan Section A.E.R.A., Summer Outing at Pelham Bay Park.

August 13-14—Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.

August 27-28—Operators' Section of the Iowa Electric Railway Association, Hanford Hotel, Mason City, Iowa.

Sept. 10 — Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

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going to waste. The usual price of the pass, therefore, is fifteen or sixteen times the standard rate paid by the riders who buy tokens or tickets. In exchange, it is found that the pass-holder averages 25 to 30 rides a week.

One other factor to be touched on in connection with prepaid transportation like the pass is its effect in recapturing riders from automobiles. The auto owner himself is led to look more favorably upon the trolley because he is flattered by solicitations for his patronage and because the form of rate appeals to him. The possible car rider who is carried for nothing by the auto rider is less likely to accept or wait for such free conveyance if he has been induced to buy an unlimited-ride pass.

Parking restrictions, falling off of novelty and increased gasoline charges are weaning the auto owner from using a luxury vehicle for business purposes. So there is no reason for mass transport purveyors to despair.

Quite lately, for example, I have helped to put on the pass under conditions where the cash fare was increased to 10 cents, the ticket or token rate left unaltered and the pass added. This produces three rates of fare according to the degree of patronage. Inasmuch as we do not disturb the rates paid by the regular and semi-regular riders, there can be little plausible opposition to a change in rates which really results in a lower average fare as well as greater revenue and more riders. It is clear, also, that a fare schedule free from odd coins and with almost no change making is a splendid tool for the rapid interchange of passengers on one-man cars.

Ride-Selling Fares in Pittsburgh

The remainder of Mr. Jackson's paper dealt with methods adopted in Pittsburgh in recent months for merchandising transportation. These included the extension of the transfer privilege on Sundays, the 25-cent and 40-cent Sunday passes and the weekly pass. These innovations have been described from time to time in ELECTRIC RAILWAY JOURNAL. The establishment of 5-cent fare zones where possible was also mentioned as a means of building public good will.

Car Designs and Their Relation to Operating Conditions*

BY J. METCALF
Traffic Department, Toronto Transportation Commission

WITH a view ultimately to having uniform entrance to all cars operated by the Toronto Transportation Commission, it was decided to adopt the front entrance as standard for the system. The one-man car necessarily has a front entrance. Standardization in this respect is appreciated by the car rider and assists in securing maximum speed in operation. The closeness of the entrance door to both waiting and approaching passengers, and the get-away of the car is accelerated by having entrance door under the control of the motorman as well as in close proximity to him.

When intersection operation is under police control considerable saving is possible with the front-entrance cars owing to the close co-operation that exists between traffic officers and motormen in Toronto. The traffic officer is near the center of the intersection, and consequently he can clearly see only the front door of a standing car. The traffic officer usually takes into account the readiness or otherwise of the street car to proceed, and regulates his signals accordingly. This is particularly the case in the downtown area during the evening rush hour, when the prevailing movement of passengers is outbound.

*Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

Loading and Unloading Data

An independent traffic department of the commission has made a running check on the loading and unloading times of the various types of cars operated. The figures shown in an accompanying table are the sums of the average times for five groups of passengers, that is, 82.2 (quoted in the first column in the table) is the sum of the average combined time of loading and unloading six, seven, eight, nine and ten passengers on Peter Witt cars. By dividing this sum by five we arrive at the average combined loading and unloading time of a group of from six to ten passengers.

It will be readily observed from the above that the Witt car is the speediest loading and unloading of the three two-man types of cars referred to in the table. It shows that the pay-as-you-leave cars absorb about 20 per cent more time, and the pay-as-you-enter type about 23 per cent more time.

The following comparative figures show the loading and unloading speeds of the two and three-door trailers, of which we have 225 in service:

LOADING AND UNLOADING TIME FOR TORONTO TRAILERS

Number of Passengers	Three-Door Trailer Seconds	Three-Door Trailer Per Cent	Two-Door Trailer Seconds	Two-Door Trailer Per Cent
6 to 10	87.4	100	94.0	107.7
11 to 15	132.2	100	161.7	122.3
16 to 20	189.4	100	232.9	123.0
21 to 25	238	100	289.9	121.8
26 to 30	297.9	100	366.5	123.0

The third door in the trailer can be used for entrance or exit, as traffic warrants. Its advantages are particularly marked during hours of heavy traffic.

One-Man Cars—Double and Single Truck

The necessity and practicability of operation of one-man cars for certain routes in Toronto was decided upon after careful observation.

While cars of the Birney type, with one door at the front end for entrance and exit, have been successful, it was thought that cars with more accommodation for riders and better facilities for leaving the car would be a great improvement. The operation of a car with treadle exit, as used in Chicago, was carefully investigated; also a double-end car with rear treadle exit in Washington.

One hundred double-truck one-man cars, with front entrance and exit and rear treadle exit, have been converted from pay-as-you-enter type cars. The revised seating accommodates 51 passengers, as against 38 previous to alterations. The width of the cars permitted cross seats to be placed only on one side and the longitudinal seat on the closed side was continued around the rear vestibule. Passengers, without doubt, appreciate the cross seats, and I believe that many riders are attracted to cars fitted with this type of seat whenever a choice is possible.

With one exception, these one-man cars were put into operation on routes previously equipped with two-man cars. The cost of conversion, including full safety control and the other necessary features, is being absorbed by operating economies within eleven months where the one-man car has replaced the two-man car, the same standard of service being maintained by the one-man car. The fact that over 95 per cent of the revenue passengers in Toronto pay their fares by tickets greatly facilitates one-man operation.

The one-man cars with rear treadle exit were placed in service during November last, and at present six routes are fully equipped with this type of car. Two routes operate into the center of the city and maintain the schedule speed, with other types of cars operating partly or wholly over the same route.

Operators are successfully handling the treadle car with capacity loads, and, as they would quickly point out faults in connection with the car, the absence of any complaint from them justifies a statement that the car is satisfactory from an operator's point of view.

During the month of March a route was changed over from operation by single-truck one-man safety cars, with a seating capacity of 32, to the double-

RELATIVE LOADING AND UNLOADING TIME FOR TORONTO MOTOR CARS

Number of Passengers	Peter Witt Seconds	Peter Witt Per Cent	Pay-As-You-Leave Seconds	Pay-As-You-Leave Per Cent	Pay-As-You-Enter Seconds	Pay-As-You-Enter Per Cent
6 to 10	82.2	100	98.2	119.5	100.1	121.9
11 to 15	123.8	100	148.7	120	152.9	123.4
16 to 20	171.1	100	201.8	117.8	204.3	119.5
21 to 25	214.6	100	251.2	117	269.2	125.2
26 to 30	255.9	100	317.2	124	319.6	124.8

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truck, front entrance and exit and rear treadle exit cars, with seating capacity of 51. The receipts of the route after the change show an increase of 14 per cent in revenue passengers and 17 per cent increase in transfer passengers. There was no alteration whatever in the schedules operated by these two types of cars.

Loading and Unloading Speed

A careful study of stop-watch observations indicates that these cars handle boarding passengers slightly slower than the two-man type of car, owing to the operators of the car having the additional duties of collecting tickets, making change and issuing transfers. Speed of the one-man treadle car in handling alighting passengers exceeds that of any two-man type of car operated in Toronto. As the car is under the entire control of one man it is much more speedy at a traffic controlled intersection than a two-man type, as it is not held by the conductor or the second man in control of car doors. Stop-watch observations indicate clearly the ability of the one-man treadle car to meet schedules. It is operating in Toronto on routes where it parallels for miles cars manned by two men without interference to the running time of the latter cars, a considerable portion of the routes being through the downtown congested area. As regards safety, our records show conclusively that the operation of the treadle car is equally as safe as two-man cars on a basis of car mileage operated or on a basis of passengers carried.

All intersections are equipped with automatic electric track switches for turning the necessary points on all routes where cars operate on all-day service. While the advantages of electric switch operation are many for two-man operated cars, it would appear, from a point of efficiency, to be an absolute necessity to have automatic switches for one-man operation, especially in city service, where intersections are relatively numerous. These switches have proved very reliable. We only receive, on an average, one emergency call to a defective switch in every 81,000 switch operations.

Six-Motor Two-Car Train

Six-motor two-car trains are being converted from cars of the type formerly used as pay-as-you-enter. One experimental train has been in service since the latter part of last year. The entrance to the first car is at the front; in fact the car is identical with the pay-as-you-leave type.

The second car of the train is front entrance and exit, with rear treadle exit, and in so far as seating arrangement and general layout are concerned, is similar to the double-truck one-man cars. A movable barrier permits the conductor to use both doors at the front for exit or entrance, as required by traffic. This operation of the barrier materially assists in speeding up the loading and unloading of the car.

The first car of the train can be uncoupled and operated as a single car just as speedily as a car used for dead trailer operation, thus giving full flexibility to half of the equipment used in the making up of the train; also it is fully equipped to pull the standard dead trailer, thus rendering the car one hundred per cent flexible. This type of two-car train was finally adopted after careful consideration had been given by the management to both this combination and the articulated type of two-car trains.

The standard color of cars in Toronto is red, with cream color trim, and the appreciation expressed by the public and others interested, when cars were first painted this color, has not lessened since it was adopted. We have found that the bright car stands out distinctly. This is a great assistance in minimizing accidents.

Features of Toronto Treadle Cars*

By W. R. McRae

Rolling Stock and Shops Department, Toronto Transportation Commission

With the exception of a few double-truck, double-end cars all of the cars which have been redesigned and converted were formerly owned by the Toronto Railway and were operated by that company as pay-as-you-enter cars. These cars totaled 347.

The first lot of cars to be altered were converted to pay-as-you-leave type. The seating capacity was considerably increased by extending the closed side longitudinal seats into and around the rear vestibule. The conductor's station is located at rear end of car body on the open side in such a position as to insure full control and safe operation of the exit door. A railing has also been installed, which provides a considerable area of "prepaid" accommodation.

Part of this pay-as-you-leave group are equipped to operate as No. 1 car of the two-car trains and the others for non-trailer operation. The majority of the remainder have been altered to single-end, double-truck, one-man cars with front entrance and exit and rear treadle exit.

The realization of the management and officials that a change in design was necessary in the entrance and exit arrangement of the one-man car if its use was to be extended in Toronto led to an investigation of "treadle" operated doors and the possibility of their adoption to meet our requirements. The necessary alterations were made to a pay-as-you-enter car to permit of the installation of this door operating device. The alterations were made along the lines of the car which we inspected. [The reconstruction of this car was described in Electric Railway Journal for Nov. 8, 1924, page 799, and Dec. 20, 1924, page 1036.—Ed.]

After the door operating mechanism was installed it was found necessary to make such alterations as would prevent any possibility of the door slamming closed in the face of an alighting passenger, which it would do if operator released the brakes, and further to permit passengers to be entirely clear of the door during the closing operation. I introduced an auxiliary valve into the system, located adjacent to the original valve puller valve, in such a manner that both valves were operated simultaneously. Air pressure was piped from the emergency line through this auxiliary valve into the valve puller cylinder, when valves were at the "door open" position. Brakes could now be released while the door was open, and it could not close while sufficient weight was on the treadle or step to keep the auxiliary valve open, but just as soon as all weight was removed, the auxiliary valve would close, and air in valve puller cylinder would exhaust, permitting spring to return puller to "door closed" position.

A demonstration showed that a practical solution had been found to overcome all of the previous difficulties and weaknesses in operation of one-man safety cars, and, further, that a one-man operated car of larger dimensions than heretofore used was practicable for moderately heavy city service. Orders were immediately placed for sufficient safety car control and treadle door operating mechanism to equip 100 cars.

A number of cars were equipped in the above manner and placed in service. They operated very satisfactorily, but it was found, however, to be rather difficult to maintain proper adjustment of the door operating and holding valves on account of variable friction losses in the mechanical method of transmitting movement from the treadle plate in platform floor to the control valves located in the door engine housing above the door. To overcome this difficulty, the manufacturers of the treadle apparatus supplied me with two electro-magnetically operated valves. These, together with the necessary resistance and a contact switch, obviated the troubles we had encountered in the mechanically-operated apparatus, and gave us as nearly a perfect door operating mechanism as it is possible to have.

It is our intention to replace the few mechanically operated treadle door mechanisms now in service with electric control as quickly as the necessary parts can be secured from the manufacturers.

Full safety control, including a line switch, is used, with the exception that the operator's foot valve has been dispensed with. The removal of this valve compels the operator to complete transactions with passengers before starting the car.

Position on Brake Valve. The brake valve has been arranged so that the ports of same come into action, starting from "release" position, in the following order: (1) Application of brakes; (2) rear exit door operative; (3) front entrance door open and rear exit door operative; (4) emergency position.

The second position, which has been added to the brake valve by a rearrangement of the ports, permits of selective operation of rear exit door. When the brake valve is at "release"

*Abstract of paper presented before the Canadian Electric Railway Association, Montreal, June 10-12, 1925.

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position, permitting the car to move, the doors cannot be opened.

When the brake valve is thrown to emergency, air is exhausted from the door engines and the front entrance and rear exit doors may be opened.

Front Entrance and Exit Doors. Two double-leaf, outward-folding doors with folding steps are installed in front vestibule. The forward pair are for entrance and the other for exit. A curved rail is installed from the center of these two doors to the center of bulkhead, to separate incoming from outgoing passengers. The entrance doors are pneumatically operated, both opening and closing. The exit doors are manually operated, both closing and opening, and cannot be opened except while the entrance door is open. The exit door will close pneumatically if open when entrance door is being closed. This arrangement permits of selective door operation without the use of two door engines.

Rear Door Red Light Signal. When the rear exit door is open a circuit is established which lights a red signal lamp in front of the operator. This red light will remain lighted so long as the rear exit door is open.

Rear Treadle Step Illumination and Vehicular Signal. The opening of the rear exit door also establishes a circuit of five lamps, three in the ceiling of the rear vestibule directly over the treadle plate and step. The other two, which are red, are located on the outside of the rear vestibule under the door engine housing. These warn vehicle drivers that the rear door is open and that passengers are about to alight.

Full Treadle Operation of Rear Exit Door. The operating valves of the rear door engine have been so arranged that the closing of the front door will not cause the rear exit door to close while there is any weight upon the treadle or step.

Operation of Treadle. A passenger desiring to alight at the rear door may step on the treadle and wait until the car comes to a stop and the operator has placed the brake valve handle at the "door open" position. Then, and not until then, will the rear door open, and it will remain open so long as there is any weight on the treadle or step. When all weight has been removed from the treadle and step the door will slowly close, re-establishing the control circuit and switching off the red signals at the back of the car and in front of the operator and also the extra illumination above the treadle.

The car is equipped with the usual safety features to make the rear door inoperative, to allow the doors to be opened when the car is left unattended, and to permit operation in the event of failure of the air. In the latter event the front doors are operated by hand while the rear door is kept closed.

Double-End Cars with Rear Treadle Exit

At the present time we are completing the installation of rear treadle operated exit doors on thirteen double-truck, double-end cars. They are equipped with full safety control, similar in every respect to the equipment just described. In connection with the treadle exit doors on both ends of the car, it was our desire to reduce the operator's duties to a minimum, when changing from one end of the car to the other at terminals. To accomplish this, the electrical contacts for the treadle doors, operator's signals, rear red light, treadle signals and Nichols-Lintern red and green light circuits are interlocked in the controller, so that when controller handles are changed to the other controller, all circuits are automatically made to suit the direction of car movement.

The first or lead car of this combination is similar in layout and operation to the pay-as-you-leave type which are equipped to haul trailer cars, and the similar type used for non-trailer operation. They are, however, equipped with an auxiliary set of resistances, extra electric contacts on automatic couplers, a line switch and a specially designed drum switch. This latter switch must necessarily be operated when making up or breaking trains. The drum switch, in addition to controlling compressed air lines and the electrical circuits between the two cars of the train, also takes care of shunting in and out of service the auxiliary resistance of the No. 1 car. The electrical connections in the coupler head of this type of car are arranged so that they can be coupled to and operate a standard trail car. All doors of the train are interlocked with the control circuit.

The second car of the six-motor train is designed for front entrance and exit and also rear exit by treadle operated door and step located in the rear vestibule. This car is equipped with two motors of similar type and gear ratio to those used in the first car of train. Both motors are installed in the forward truck. Also a trolley pole, circuit breaker, reverser switch and resistor unit are included in the equipment. When coupled to the leading car the trolley pole is hooked down to the roof, the circuit breaker opened and the reverser switch set in forward position. When it is desired to move this type of car in yards or buildings, or to make up trains, the trolley pole is placed on the wire, the reverser switch, which has a removable handle, is set in the desired direction of movement, and by means of the circuit breaker and powered hand brake, well controlled and safe movement is secured.

Control of both front doors and the rear treadle operated exit door is located at the conductor's station. The front doors are equipped with a pneumatic door engine, operated in the usual way by lever and rod to engine valve. The rear treadle exit door is operated by a switch of the push button type, which, when in position for train movement, closes the train control circuit and opens the circuit through which passes current to one of the electro-magnetic valves of the rear treadle exit door engine making it inoperative while the train moves.

When the train is at rest, and it is desired to have the rear exit door become operative, the door control switch is thrown to rear door operating position. This movement opens the train control circuit and connects the circuit to the treadle valves and switch. The depression of the treadle completes the circuit and the exit door will open.

Should the conductor inadvertently or prematurely reverse this switch, the rear exit door will not close in the face of alighting passengers while there is weight on the treadle or step. Due to train control interlock, the train cannot be started until the doors are all closed; therefore, the train cannot be moved until all the doors are closed and proper circuits established. Red signal lights, located in front of the motorman of the train and the conductor of the second car, are lighted while rear treadle door of second car is open. The standard signals between motorman and conductor of second car, as used in all trail cars, are installed in the second car of the train.

New York State Convention

PLANS for the 43d annual meeting of the New York Electric Railway Association are virtually complete. The meeting will be held at Hotel Champlain, Bluff Point, N. Y., on June 26 and 27. Following is the program of the technical papers to be presented on Friday, June 26, beginning at 10 a.m.:

"Some Comment on the Electric Railway Industry," by Lucius S. Storrs, managing director American Electric Railway Association.

"Electric Railway Equipment Maintenance and Shop Practice," by L. J. Davis, assistant to general manager Brooklyn City Railroad.

"Why Doesn't New York Speak for Itself?" by Labert St. Clair, director of advertising American Electric Railway Association.

"What Can Be Accomplished by a State Information Committee," by J. S. S. Richardson, director of the Pennsylvania and New Jersey Committees on Public Utility Information.

"Is Educational Work Worth While?" by Edward Dana, general manager Boston Elevated Railway.

"The Investigation and the Trial or Settlement of Accident Cases," by W. Harry Sefton, assistant counsel Brooklyn-Manhatton Transit Corporation.

"The Articulated Car," by W. G. Gove, superintendent of equipment Brooklyn-Manhattan Transit Corporation.

"Track Economies Through Welding," by R. B. Fehr, development engineer Rail Welding & Bonding Company.

There will be two speakers at the dinner Friday evening. One will be William L. Ransom, general counsel Consolidated Gas Company, New York, and formerly chief counsel Public Service Commission of New York, who will speak on "Utility Management Under State Regulation." There will also be a talk on topics of the day by Dr. E. J. Cattell of Philadelphia.

Special Pullman cars will be attached to New York Central train No. 29, leaving New York on June 25 at 8 p.m. Eastern standard time. The cars will be detached from the train at Bluff Point, so that it will not be necessary to leave them immediately upon arrival. One sleeper will return to New York, leaving Bluff Point on June 27, and the remainder on June 28. Applications for Pullman accommodations, together with transportation, should be made to Carl Beck, 150 Broadway, New York City.

The entertainment committee is preparing a program which will include sightseeing trips, bridge tournaments, dancing, etc. There will be a sweepstakes handicap golf tournament. Handicaps should be sent to T. R. Langan, chairman entertainment committee, 150 Broadway, New York City.

Hotel reservations can be made through J. P. Greaves, 2 West 45th Street, New York City.

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Mid-West Claim Agents to Meet in St. Louis

ST. LOUIS, MO., will be the scene of the fifth annual convention of the Mid-West Claim Agents Association, which will be held at the Hotel Jefferson on July 17 and 18. In addition to the address of President Trevor Neilson and reports of officers, a number of papers will be presented.

An address of welcome by Mayor Victor J. Miller of St. Louis will open the Friday session at 10 a.m. Dr. T. V. Boyd will discuss "The Relation Between the Public and the Company from a Company Surgeon's Point of View." Charles B. Hardin will speak on "What Methods Does the Claims Department Follow in Preparing Cases for Trial?"

At the afternoon session on July 17, beginning at 2 o'clock, papers will be presented by Dr. Henry J. Scherck on "Perjury for Pay"; by Walter E. Robinson on "To What Extent Does Your Legal Department Enter into the Settlement of Either Claims or Litigated Cases"; by R. S. Mahan on "Practical Prevention of Accidents"; by D. L. Fennell on "Co-operation Between Operating Department and Claim Department."

The Saturday morning session will begin at 9 o'clock. At this session papers will be read by D. M. Finch on "The Bonus Plan in Effect in Des Moines"; by C. B. Proctor on "Results of Collective Bonus System"; by H. F. Burnie on "Motorbus Operation from a Claim Agent's Point of View"; by S. G. Shaw on "What Effect Has the Automobile Had in Lowering the Caliber of Witnesses Secured by the Platform Men"; by Warren Swisher on "Should Pedestrians Be Permitted by Law to Halt Vehicles at Street Crossings."

Following the presentation of papers, there will be the annual election of officers and general business of the association.

Increasing Passenger Traffic by Advertising*

By Frank L. Blanchard
Director of Public Relations
Henry L. Doherty & Company, New York

EVERY street or interurban electric railway company should have a well-defined advertising policy. Its annual budget should contain an appropriation to cover the estimated cost of the publicity for the ensuing year. This, of course, cannot be determined until after a thorough canvass of its advertising needs has been made.

There are two kinds of advertising that should be regularly carried on by a live railway company intent upon getting the most out of its territory. Institutional advertising is employed to create public good will. It consists of attractively prepared advertisements setting forth important facts about the company, its organization and personnel, the service it renders the community and its achievements. Such advertising is wholly educational in character, its purpose being to interest the public in the enterprise as a home town institution and thus build good will for it.

The second kind of advertising street railways must undertake, and by many operators considered of greater importance than institutional advertising, is business-getting publicity. It takes an entirely different kind of copy to induce people to become riders in our cars. Business-producing advertising deals with the character of the service the company is furnishing the public; points out the advantages of street cars over other forms of transportation available in cities; gives a list of the parks, resorts and other places of interest that may be reached by the company's lines; tells how open-air car riding contributes to good health; how much safer the cars are for children going to school than walking on the sidewalks where they must cross many streets; how much time can be saved in the larger cities by women when out shopping.

I think you will agree with me that one of our most important tasks is to induce the owners of automobiles to use the street cars instead of their motor cars in going to and from their places of business.

The question that we as street railway men want answered is this: "How can we convert automobile riders into car riders?" One thing we can do is to secure a list of automobile owners in our territory and plan a direct mail advertising campaign that will place before them facts and arguments that will convince them that while automobiles are a great convenience and comfort, they are inconvenient and inappropriate for use in congested city territory. The letters, booklets or folders used in such a campaign should be prepared with great skill. All statements made concerning automobile riding should be conservative, in order not to offend or antagonize those who own motor cars.

I take it for granted that you are all regular advertisers in the newspapers. While your direct mail campaign is on, one of your newspaper ads each week should also be devoted to the conversion of automobile riders into street car riders. These two advertising forces working together will be found mighty effective in increasing the volume of passenger traffic, not only in winter when many automobile owners lay up their cars but also during the summer when inducements to take to the road are so numerous.

In those cities where bus companies compete with the street railway the latter will find advertising an important factor in maintaining or in building up its traffic load. For short hauls the street cars have so many advantages over the buses that there should be no difficulty in convincing a large part of the public that the street cars furnish the best service.

"What are some of these advantages?" you may ask. First there is the roadbed. Street cars travel on a smooth, level track while buses proceed over pavement or other surface that is often rough and uneven. Moreover, street cars are roomy, commodious and well ventilated. Buses are, of necessity, smaller, the seating facilities are cramped and the ventilation in winter is poor.

But, someone will say, all these things are known to everybody: therefore, why spend money in advertising them to the public? As a matter of fact, they are not known to everybody. Because you know them is no proof that any considerable part of the community knows them. Human nature is such that people are ignorant of many things that they see every day and yet do not observe. If we have a business message we desire to lay before them we must put it in the simplest and most attractive form and then repeat it over and over again until finally it registers in their brains.

In our street railway advertising we must keep this fact constantly in mind. We must make our announcements so readable and interesting that people will want to look at them. There are many persons in the world who do not appreciate the advantages they enjoy until someone comes along and tells them what they are. Street cars are such familiar objects that we overlook the ways in which they contribute to our comfort and make our lives pleasanter.

A new factor in the street railway and other public utility businesses that will greatly stabilize and promote our industry is customer ownership. All advertising is not confined to the newspapers, the magazines and the billboards. Word of mouth advertising is, so far as its limitations allow, the best kind of advertising. Every man or woman who purchases a share of stock in your company becomes a booster for the road and a protector of its interests.

The larger the number of passenger owners of our securities the greater will our transportation traffic load become. Because they have a stock or bond interest in the company they will do what they can to increase its business while they themselves will be among its most constant patrons. They become untiring advertisers of the road, working without pay. They defend it when unjustly attacked by its enemies. They oppose hostile legislation either by city or state, and they often make suggestions that are worth thousands of dollars to the company.

Some of you property managers occasionally have trouble in securing a renewal of your franchise. Opposition, political or social, develops. Perhaps a self-appointed reformer attacks the company or a hold-up politician makes a few remarks that might be construed as a veiled threat of trouble in case certain persons were not seen before the vote on the franchise was taken. When such a situation arises there are two legitimate ways of handling it. One is to marshal to your support as many of

*Abstract of a paper presented before the Central Electric Railway Association, French Lick, Ind., June 2-4, 1925.

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the city officials, substantial business and professional men, and passenger owners of your securities as possible. The other is to present to the public through a series of well thought out advertisements published in the newspapers such arguments and data as will convince the public that the franchise should be renewed, and that this should be done not so much for the benefit of the company as for the benefit of the community itself.

Getting the Community with You*

BY THOMAS FITZGERALD
Vice-President Pittsburgh Railways

IN 1919, about a year after the Pittsburgh Railways went into receivership, there came to Pittsburgh a steam railroader, A. W. Thompson, to take the presidency of the Philadelphia Company and affiliated companies, including the Pittsburgh Railways, Duquesne Light, Equitable Gas and other companies. He insisted upon the policy of making every possible effort to conduct the railway as nearly as possible in accordance with the wishes of the public. In other words, actually to put service first in everything, to insist upon only those things which are necessary to good service, and to depend upon the results of this policy for financial rewards over and above the money absolutely necessary for the maintenance of service.

The truth of Lincoln's words "with public sentiment nothing can fail, and against public sentiment nothing can succeed" was recognized by the management, so it set out deliberately to find out what public sentiment actually is regarding its activities and to do its best to conduct itself accordingly. Every effort is made to get full information regarding the affairs of the railway to the public in order that the sentiment may be as nearly as possible based on facts.

The first step in following out this policy was to enter into a new agreement with the city of Pittsburgh. The negotiations lasted over two years, during which time every effort was made to give fullest publicity. Finally, on Dec. 20, 1921, the agreement under which the railway is now operating was passed unanimously by the City Council and approved not only by the Mayor but by the Mayor-elect.†

The agreement is in effect a service at cost arrangement which seemed to suit the Pittsburgh siutation better than any other method of co-operation. It has the usual weakness of service at cost contracts in that it contains no definite reward for efforts to improve service and to increase the usefulness of the system to the public. This is theoretically cared for by a clause which provides for a distribution of surplus to the company amounting to one-half of any economies effected, after all debts are paid. The prospect of gaining any such reward during the term of the contract, which is ten years, seems, however, very remote.

A usual defect in other service-at-cost contracts has resulted in the inability of the companies to finance improvements and extensions. This has been overcome in this instance by the provision that the Pittsburgh Railways may earn the cost of new money in addition to the fixed return referred to above.

Looking back over the sixteen months that have elapsed since the return of the property, the most important factor in the prosecution of the management's plan seems to be the fact that the returns to security holders are fixed by the contract. With the complete publicity provided, the myth of fabulous fortunes diverted from service improvements has been properly executed and buried, at least for ten years. It is to be hoped at the end of ten years that this spirit will remain buried and that the spirit of co-operation and reward for effective effort will be very much alive.

On this idea of a reasonable fixed return to the company has been built a program of publicity for the information of the public. The principal feature has been the insistence upon the fact that unfair charges and license fees are reflected primarily in increased fares and impaired service. Under the contract the company's limited return is practically assured unless the public wishes to dismember the property and split it up into a number of smaller independent systems. This latter, it is pointed out, would be a tremendous blow to the community in its most vital functions.

Following this, the fact is stressed that for all practical purposes the railway system is a public institution, regulated, although not managed, by the city authorities. For the car rider the company acts as a kind of trustee, taking his money, paying wages, operating expenses, taxes and interest on the money invested and applying anything over this to improvements or to reducing fares, all of the time managing the property to the best of its ability, and when any question of public interest comes up the company gives its best advice, accepts the decision of the public and loyally tries to carry out that decision. It is frankly stated by company representatives in public meetings that its policy is based on the opinion that the car rider is more interested in improved service than he is in reduced fares. So far, in many meetings during the last year, this statement has not been publicly contradicted by any one, although of course many requests for reduced fares have been made.

The present policy is based on the idea that as public opinion changes the policy will undoubtedly be changed accordingly. If the public insists upon reduced service and reduced fares this will undoubtedly be the policy. It is hoped that as time goes on the public will realize that its interests will be best served by the best possible service at the lowest possible rates gained through a good reward for effective effort. Until this sentiment has been gained, the policy is to accept what can be decently earned and give the best possible service for that. In other words, it is believed that the reward will follow the effort. Instances where effort has been rewarded can be pointed out. On the other hand, instances where effort has apparently been penalized can also be cited. If only the successful cases are considered, one can become a Pollyanna. If only the failures are considered, one can become a confirmed pessimist. Whether or not real progress can be made through such a policy is largely a matter of personal opinion or belief. Undoubtedly the overwhelming opinion of the Pittsburgh Railways officials and a large majority of the other employees is that such a policy has been and will be successful.

In addition to the contract as a basis on which to arouse public interest in street railway affairs, it was thought necessary to find some tangible way in which to convince the public that the management was actually doing something, no matter how small, to favor it. A large number of additional transfer privileges have been established. Some short lines have had fares reduced from 8½ cents to 5 cents. The same reduction in fare has been made on the outer ends of some long lines. In Washington, Pa., where a 6-cent fare was in effect, a 95-cent weekly pass was established. Recently the fare was reduced to 5 cents and the weekly pass to 75 cents, with no apparent loss in revenue.

Another important change in fares was the Sunday and holiday pass. On account of the predominant effect of weather conditions on Sunday and holiday traffic, it is very difficult to estimate the financial benefit that has resulted. There is no question, however, that Sundays were falling below previous years at a much greater ratio than weekdays. After the pass was inaugurated they more than held their own and, under similar weather conditions, are going ahead of previous years.

The last and most important fare adjustment intended to gain public support is the $1.50 weekly pass, the use of which started on June 1. The hope behind the pass is that by its use the transportation service will become so useful to the people of the community that they will permit the management to gain some reward commensurate with this usefulness.

It is believed that the attitude of the public and the men has been influenced greatly by these evident efforts to make the service more useful. There have been some outstanding bits of evidence confirming this idea. One was the successful introduction of one-man car operation. In the installation of one-man cars the service was improved. In some cases, large double-truck cars replaced small single-truck ones, car for car, thus providing an increase in the number of seats. Where large double-truck cars were already in service more frequent service was installed.

The operation of multiple-unit trains on heavy grade lines carrying dense traffic has been inaugurated, in place of

*Abstract of a paper presented at a meeting of the Central Electric Railway Association, French Lick, Ind., June 2-4.

†A summary of the principal features of this agreement was published in ELECTRIC RAILWAY JOURNAL, May 23, 1925.

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motor car and dead trailer trains. This was appreciated by the car rider on account of the smoother acceleration, especially of the trail car. The dead trailers on the heavy grade lines were most uncomfortable on account of inevitable slack in the couplers, causing severe jerks when starting. In addition to the multiple-unit trains, the six-motor train, developed by a previous management, is being installed on lines where traffic and grades do not require multiple-unit equipment.

One insignificant change in practice resulted in a surprising amount of favorable comment. This was the change in the color of cars from a deep Tuscan red to a medium bright orange color. The red was not a brilliant color and the change to the bright orange was very striking, especially in the narrow streets of Pittsburgh on a gloomy day.

So far as the management was concerned, the most important new thing that was done was the establishment of a commercial department, corresponding to the sales department of an industrial organization. This department is in charge of a manager with full responsibility for public relations, amount and kind of service and rates of fare. It is the principal point of contact between the public and the management and is free from the responsibilities for operations which rest upon the general manager. It is hoped and believed that in this way a more sympathetic attitude toward the public may be acquired and at the same time responsibility for earnings to pay for the quality of service specified by the department will prevent the giving of more service than justified.

In addition to the commercial department a new department of research was organized whose responsibility it is to keep the management from getting into a rut. This department is responsible for our relations with other companies, especially to see that any information other companies may want is made available to them. Primarily, however, its responsibility is to see that the management is kept informed of any new developments affecting the business and to investigate and report on subjects of interest. Statistical information naturally is compiled in this department. The relief which this department affords the executive, commercial and operating departments from investigations and reports which frequently clog up the whole machinery of management is tremendous.

The history of the railway's attempt to improve service on lines operating to the central district may serve as an example of the working out of the policy of adapting company activities to public opinion and suggests an answer to the question as to whether or not such a policy offers good prospects of favorable results. As a palliative only for the congested condition of traffic in the downtown district the railway proposed to turn its long lines short of the congested area.‡ Opposition arose, however, on the part of the downtown merchants and the Real Estate Board. They appealed to the Public Service Commission and the Court for a restraining order. When it seemed evident that neither the Public Service Commission nor the court would do anything to interfere with the plans and the business men suggested an additional track on a street into the business district which would better distribute the railway operations and remove a large number of cars from the point of greatest congestion, short looping of other lines was agreed to, bringing about a great relief from present conditions. Another result was an ordinance restricting parking, which has made a tremendous improvement in service.

What results have been secured? To answer such a question is simply to express an opinion. On Feb. 1, 1924, the United States court which had held the property in receivership for six years practically said that the company was still insolvent, but its property would be returned to it subject to the protection of the court until Dec. 1, 1924. At the end of December the company was able to report that the property had paid all of its current expenses, including charges on an additional $5,000,000 new capital and the more than $330,000 annual payments to be paid to municipalities if earned. A very meager sum also appeared on the right side of the ledger as a surplus from the year's operations. The court did not deem it necessary to continue its protection. It is now five months later, and with the benefits from the improvement derived from the $5,000,000 beginning to accrue it is hoped to show black figures again this year in spite of a very severe slump in business.

‡Details of this plan and of the one which eventually was adopted were published in ELECTRIC RAILWAY JOURNAL, May 30, 1925.

Co-ordination of Transportation Proposed in Scotland

COMPETITION of buses with tramways was discussed at the annual conference of the Scottish Tramways Association, held at Ayr recently. One suggestion came from H. C. Babb, engineer and manager of the Musselburgh Tramways Company. Considering a remedy for the transport problem, he suggested that there was an example in the joint electricity authorities constituted by the Electricity Commissioners under the powers conferred on them by the electricity supply acts. As the country was being divided by the commissioners into electricity supply areas, so it should be divided into transport areas and an authority formed in each with full control of transport services in the area. The bus interests should be represented on the transport authority. With such a body operating, wasteful overlapping would be avoided.

American Association News

Entertainment

PLANS for the entertainment features at the October convention of the American Electric Railway Association were considered at a meeting of the entertainment committee held at association headquarters, New York, on June 15. Those present were S. J. Cotsworth, chairman; Mr. Riley representing G. A. Barnes; C. H. Beck, H. L. Brown, F. A. Elmquist, E. C. Faber, C. E. Hale, J. W. Hancock, L. H. Palmer, S. L. Poorman, W. J. Stanton, J. W. Welsh, F. C. J. Dell and Morris Buck.

Features planned for Sunday include a golf tournament during the day and a sacred concert at the Marlborough-Blenheim in the evening. Monday will be devoted to registration. A reception to the president and officers is to be held that evening at 9 o'clock. A card party is planned for Tuesday afternoon for the ladies.

For Tuesday evening a general meeting of the association under the auspices of the advisory council is planned. The principal address will be given by some speaker of national prominence. The Coffin prize is to be awarded at this meeting. Following the evening meeting there is to be a dance. On Wednesday evening, a special entertainment is to be held. This will be entirely different from the entertainments given in the last few years. For Thursday afternoon a golf tournament for ladies is planned at the Sea View Golf Club. The grand ball will be held in the ballroom on the Pier on Thursday evening.

Chairman Stanton of the golf committee was authorized to arrange both the Sunday tournament for men and the Thursday tournament for ladies, and to provide suitable prizes. Mr. Cotsworth will have charge of the music for the sacred concert and for the ladies' entertainment. Messrs. Palmer, Stanton, Beck and Brown were appointed a committee to investigate the subject of dance music and to obtain suitable bands. For the Monday evening reception, Harry Reid was appointed chairman. George Barnes was appointed chairman of the sub-committee on ladies' entertainment. Messrs. Palmer and Faber were appointed a committee to secure propositions from high-class concert singers and were instructed to report back to the committee. Mr. Brown will have charge of the Tuesday afternoon ladies' performance and will also provide ushers for the evening meeting. Carl Beck was appointed chairman of the committee on the Wednesday evening entertainment. Mr. Faber will be in charge of arrangements for the Thursday evening ball.

It was decided that the association should have a representative at the gate for all evening entertainments. Mr. Elmquist was appointed chairman of a committee to represent the association, so that only persons with the proper credentials would be admitted to the pier.

A resolution was adopted that the pier be reserved for a dance on Tuesday evening following the evening meeting of the association. In this connection, it was pointed out by Mr.

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Dell that the contract with the Pier management necessitates that every one be off the pier by 12:30 a.m.

Several plans were discussed for the Wednesday evening entertainment. It was proposed that the Hippodrome be used. Mr. Dell pointed out that in the event of cold or windy weather this auditorium would be exceedingly uncomfortable to the audience, so that arrangements should be made to transfer any entertainment to the ballroom in the event of bad weather.

A motion was passed that the executive committee of the association be requested to appropriate a total of $6,000 for entertainment. A sub-committee on publicity was appointed consisting of Messrs. Buck, Kenfield and Colton. A sub-committee to co-operate with the exhibit committee consisting of Messrs. Brown and Hancock was also appointed. It was decided to hold the next meeting early in September.

Power Transmission and Distribution

WHEN the power transmission and distribution committee of the Engineering Association met in New York on June 11 and 12 reports of the various sub-committees were received and adopted. The report of the main committee will be very interesting and useful, as many matters under discussion are presented in final form.

A complete review of the text book matter in the Manual has been brought in by the concrete pole sub-committee. This will give co-ordinated data which will enable an engineer to design such poles for definite service requirements.

The sub-committee on catenary construction brought forward a compendium of experience which will give valuable information regarding modern catenary construction methods. It also contains examples of recommended practice.

The whole question of signal aspects for continuous track circuit signals as well as trolley contact signals has been reviewed and rewritten. In the finished report, the complete operation of running a train through the various types of blocks will be worked out. Specifications of hard-drawn trolley wire and high-strength alloyed trolley wire have been completed. In almost all points they are in accordance with the A. S. T. M. specifications. A review of causes of breaks in trolley wire with an analysis of the tabulated results is being completed and will be accompanied by charts, showing relative sources of causes of such breaks.

A section has been prepared for the manual on temporary trolley contacts, by the use of which it is hoped to eliminate damage being done to the trolley wire by the use of ordinary wire hooks, etc. The present trend of construction on trackless trolley systems has been followed up and a recommended practice report has been brought in.

The sub-committee on return circuits has classified the methods in use by systems under comparable conditions and has drawn several conclusions as a guide to future bonding methods.

Radio interference has been investigated. An instructive report, along with experimental tests and a great deal of miscellaneous information, is being prepared.

The "Preese" test for galvanizing came in for much discussion. Although admittedly not entirely satisfactory, it was decided not to recommend its immediate removal from the manual. Attention should be drawn to its unreliability in certain cases. It was felt that the whole question of a proper test should be settled at an early date.

Members present were: J. Walter Allen, J. H. Drew, Charles Gilman, H. W. Griffin, C. J. Hixson, C. D. Hancock, M. W. Cooke, F. McVittie, H. S. Murphy, J. F. Neild, W. J. Quinn, W. Schaake, J. M. Waldron, F. J. White, W. E. Huber, Adrian Hughes, Jr., W. H. Bassett, Jr., G. D. Radburn, Mr. Bailey, Mr. Arms, M. B. Rosevear, sponsor; C. H. Jones, chairman.

Purchases and Stores

PRESENT at the meeting of the joint committee on purchases and stores of the Engineering Association and stores accounting of the Accountants Association, held in New York on June 15, were for the Engineering Association: A. A. Ordway, J. Y. Bayliss, J. Fleming, F. A. Jordan, P. F. McCall and A. E. Hatton; for the Accountants Association: R. A. Weston and T. E. Wilkin.

Due to the untimely death of Chairman H. H. Lloyd, the first business was the election of a chairman. Mr. Ordway was elected as chairman pro tem. It was decided to choose an acting chairman for the remainder of the year. Mr. McCall was elected to the position.

Attention was devoted by the committee to a review of the various subjects for inclusion in the annual report. A proposed report by C. A. Harris on a centralized system of stores was presented for discussion. It was brought out that two separate and distinct considerations were involved: (a) Physical centralization of materials; (b) centralized control of stocks. Centralized control, it was considered, was desirable and economical.

Methods of handling freight and express bills were considered. It was agreed by the committee that this subject could not be completed during the current year. Accordingly it was recommended that it be assigned as a subject for next year's committee.

Mr. Fleming submitted for consideration a number of purchasing department forms. These included two forms of purchase requisitions, two forms of requests for quotations, purchase order, and a material received report. After some discussion a selection from the forms submitted was made for inclusion in the report.

At the beginning of the second day's session, suitable resolutions were adopted on the death of Mr. Lloyd.

The national standard invoice form prepared under the sponsorship of the National Association of Purchasing Agents was indorsed and it was recommended to the executive committee for action. A report prepared by Mr. Ordway setting forth the advantages of centralized storekeeping was adopted, with the recommendation that the subject be discontinued. Routine methods to be followed in the purchases and stores department was recommended for continuation as a subject for next year. A number of other subjects were discussed for inclusion in next year's program.

Some consideration was given to the program for the October convention. It was the sentiment of the committee that one afternoon should be devoted to a meeting of purchasing agents and storekeepers, the same as for the last two years. Suitable subjects for discussion on the convention floor were taken up, but no definite decision was reached.

Welded Rail Joint Committee Progress Report

COPIES of the third progressive report of the committee on welded rail joints were distributed to all members of the American Electric Railway Association early in June. Additional copies of the report are available at association headquarters at cost, $1.50. It also was reprinted by the American Welding Society in the May issue of its journal. Copies may be obtained from William Spraragen, secretary American Bureau of Welding, 33 West 39th Street, New York City.

This report makes an attractive and well-illustrated pamphlet of 136 pages. The contents is varied and includes, among others, the following items:

Tensile Tests—The tensile tests are reported in diagrammatic form for 64 different joints, including apex joints, Lorain bar joints, Lorain butt joints, cast weld joints, thermit joints and ten different varieties of seam-welded joints. Extensometer readings show the action under test of the head, lip and each side of the base of the rails.

Bend, Drop and Impact Tests—Forty joints are reported on in the above three types of tests, including for comparison, drop test made on unbroken rail. A description of the repeated impact testing machine designed by the committee and now in use at the Bureau of Standards is included.

Examination of Tested Joints—The report includes a detailed description of the method of failure of a large number of joints, in addition to illustrations showing the full size joints. Two metallographic reports are included—one by the United States Bureau of Standards and one by the Union Carbide and Carbon Research Laboratories.

Program of Future Investigations—The first three progress reports have dealt with the present state of the art of making welded joints. This investigation is substantially completed. The committee's program for future investigations looking toward improvements and developments in making welded joints is given in detail in the report and covers the work that will be done during the next twelve months or so.

Miscellaneous Data—In addition to the above the report contains brief references to the rotary service testing machine which it was intended to develop; also to telemeter and otheograph tests. It describes a new type of contact pyrometer developed by the United States Bureau of Standards. It also contains reports and comments on preheating and postheating investigations.

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The News of the Industry

Fare Decision Significant

Belt Line Decision of United States Supreme Court Emphasizes Right to Reasonable Fare

Much interest attaches to the decision of the United States Supreme Court on May 25 in favor of the Belt Line Railway Corporation, New York, referred to briefly in the ELECTRIC RAILWAY JOURNAL for May 30, page 862. The parties on the other side in the suit were the District Attorney of the County of New York, the State of New York and the State Transit Commission. The full decision of the Supreme Court, received since the previous article was published, brings out a number of additional interesting points.

After reciting the history of the case, the decision declares that the company was justified in appealing to the federal court for an injunction from the ruling of the commission that it should make a joint fare of 5 cents with other companies in New York. While the commission began in 1920 to hear evidence whether the rate should not be increased to 7 cents, the company was not bound to await final action by the commission and in the meantime to serve without just compensation, if the rate was confiscatory.

The lines of the Belt Line company are controlled through stock ownership by the Third Avenue Railway, New York, and in its plea the company did not ask to be relieved from a joint fare with these lines, but with the other railways of the city, with which it had no corporate connection. The Supreme Court declared that this request for relief for some through routes and not for others was within the rights of the company, and the question of whether the business of the Third Avenue Railway was to be benefited was not involved in the suit. The court found nothing in the charter of the company or the laws under which it was organized that imposed any obligation to carry passengers for fare proposed.

The contention of the city was that additional traffic on this joint route would not be carried at a loss when considered in connection with the additional expense involved in carrying it, but the Supreme Court declares this to be an unjust method of determining the cost. It says that while a carrier has no constitutional right to the same rate or percentage of return on all its business, the state may not select any class of traffic for arbitrary control and regulation. The management and the right to control the business policy of the company belong to its owners. In this portion of the decision, the Supreme Court declares that "the mere fact that a rate is not confiscatory does not indicate that it must be deemed to be just and reasonable."

The Supreme Court did not attempt to determine the valuation of the property, but after considering the indebtedness of the company and the valuation made by an engineer who had been employed by the commission to make a valuation of all the street railroads in the city it decided that the resumption of the transfer business in question would require additional operating expenses in amount in excess of the resulting increase in revenue, and that the rate proposed was confiscatory.

Permit for St. Louis-Kansas City Line Refused

The Missouri Public Service Commission has made an order denying the application of the St. Louis-Kansas City Short Line Railroad for a certificate of convenience and necessity to construct and operate a double-track electric interurban line from St. Louis to Kansas City. The commission held that in view of the magnitude of the proposed undertaking and its importance to the public the company should be entitled any time within one year to have a further hearing to prove its financial ability to pay the cost of constructing and operating the proposed line. It has failed so far to show this to the satisfaction of members of the commission, the order stated.

Evidence produced at the several hearings held on the application was that it would require from $30,000,000 to $40,000,000 to construct the line and acquire right-of-way, while an additional $20,000,000 would be needed for equipment. The promoters said that they had expended some $260,000 in preliminary work on the line and had secured right-of-way over nearly the entire route.

Several steam railroads contended that present rail facilities between the two cities were adequate. The commission ruled that the fact that the road would compete with existing steam roads was not in itself sufficient to warrant refusal to issue the permit, but that more evidence must be presented of the company's financial ability to construct the railroad.

Insulls After Illinois Line

The Insull interests of Chicago are negotiating for the purchase of the Chicago, Peoria & St. Louis Railway between Pekin and Springfield, Ill. They will rebuild it and electrify it. For months a patrons' committee has been active in securing a 200-ft. right-of-way along the route, the principal condition upon which the Insulls agreed to take over the transportation line. The road, if purchased, will be combined with the Chicago & Illinois Midland and will reopen many Illinois coal mines closed or curtailed in production because of lack of shipping facilities.

Ten Cents Cash

Omaha Hopes to Make Ends Meet Under New Fare Allowed by State Commission

Ten-cent cash fares are being charged by the Omaha & Council Bluffs Street Railway, Omaha, Neb. The State Railway Commission on June 10 granted the company an increase in fare to bring annually between $311,000 and $367,000 more revenue. The company accepted the increase and put the new rate in effect at once.

Patrons pay a 10-cent cash fare or buy six tokens for 40 cents. This is an increase of 3 cents in the cash fare and five-twelfths of a cent in the token fare. School tickets are abolished. The fare schedule follows: Adult cash fare, 10 cents. Adult tickets, six for 40 cents. Children's cash fare 5 cents (tickets, ten for 35 cents), from ages of five to twelve years. These formerly were 3 cents each. School tickets, abolished; they formerly sold at 5 cents.

R. A. Leussler, vice-president and general manager, also promises supplemental bus service at an early date. He made a statement in part as follows:

> The rates of fare fixed by the State Railway Commission will not, in our opinion, yield the increase in net income to which the commission states the company is entitled. Much depends upon the volume of traffic and the trend of price level of the items going into operating expense. If the travel on street cars should continue to decrease at the same rate as it has for a year past then the rates will fall considerably short of producing the revenue intended.
>
> If, on the other hand, travel should increase, as we earnestly hope it may, then the rates will perhaps yield a sufficient amount of revenue. The railway has ever been anxious to do its part in furthering the prosperity and best interests of the communities it serves. In line with that policy it did not press its right to an increased fare at the time of the valuation. In line with that policy, too, the company will make every endeavor to make the rates just fixed prove sufficient. To that end it will seek to increase travel and will at the earliest date possible start bus service to supplement its street car service. This bus service will necessarily be limited at first, but if it proves satisfactory the company will add to it from time to time as results justify.

In its opinion the commission holds, that if operating costs continue at the same favorable level the rest of the year that they have held the first five months, the company will receive a return of 7 per cent on the valuation of $14,100,000. In its application, the company sought an increase of $400,000 a year in revenue and made a claim for amortization of losses for five years back. The commission holds that as the company in 1923 withheld a request for an increase, it is a party to previous losses and cannot now ask to have them made up.

Depreciation set up and additions and betterments practically offset each other, say the commissioners.

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International Eight-Cent Appeal

The appeal of the International Railway, Buffalo, from the decision of the Public Service Commission for reconsideration of the 8-cent fare award on the local lines of the company was scheduled to be heard June 18 at Buffalo. In appealing from the 8-cent fare, the International seeks a higher valuation than the $22,000,000 allowed by the commission when it boosted the fare from 7 to 8 cents in Buffalo. At the time of the ruling, Commissioners Semple, VanNamee and Prendergast said that valuation should be higher, but did not indicate any amount. Commissioner Lunn has now replaced Commissioner Semple, a fact which may have an important bearing on the case.

It is believed that the rehearing will be decided by argument, rather than through the production of witnesses by the city of Buffalo and the railway. The main effort of the company will be directed toward establishing certain sums for going value and fees to Mitten Management, Inc., as part of the valuation of the city lines. These two items were eliminated by Commissioner Pooley at the previous hearing.

Little progress has been made by the railway and representatives of the city of Buffalo and Chamber of Commerce at the city-company conferences on a service-at-cost plan of operation under municipal supervision. Several meetings have been held. The Chamber of Commerce has suggested that the company be allowed a fixed return of $1,800,000 annually, but the City Council opposed this amount. It is reported the railway would be satisfied with this amount.

One-Man Cars in Use on Several Cleveland Lines

Limited service with one-man cars is still being operated by the Cleveland Railway. Thus the company is sustained in the contention which it made last December about the need of these cars when the question of their operation threatened to become a political issue. The December losses by the company on the Lakewood lines assumed such proportions that the company put one of the three lines, namely, the Clifton Boulevard line, on the one-man basis, and at that time said it might be necessary to extend this plan to the two other lines, the Madison Avenue line and the Detroit Avenue line, in Lakewood.

Following this, the city of Lakewood arrested the operators of the one-man cars and subsequently the officials of Lakewood and the company met in an attempt to arrive at a peaceable solution. This came on Dec. 31, when the controversy was settled by the company returning to two-man operation of the Clifton Boulevard lines in Lakewood and by the city of Lakewood modifying the company's franchise so as to make the rate of fare to Lakewood riders the same as that obtaining in Cleveland. The Lakewood fare previously had been 5 cents; the city fare was 6 cents or nine tickets for 50 cents.

Lakewood amended the franchise, which amendment was accepted by the company, with the approval of the city of Cleveland, and the police court cases against the one-man operators were nulled. At the time the Lakewood warrants were issued, Cleveland and Newburgh Heights took similar action, but these cases were likewise nulled.

The cars on the East Thirtieth Street crosstown line in Cleveland still are being operated by one man and have been operated that way since its inception. At present this line and several outlying stub lines of light traffic are the only ones operated on the one-man plan by the Cleveland Railway.

$5,000,000 Long Island Electrification Ahead

George Le Boutillier, vice-president of the Long Island Railroad, says the main line to Mineola will be the next to be electrified and that plans are now being considered by the engineers of the road for this work. The line will then be continued to Oyster Bay and Hicksville, and the latter station will be the terminus of the electric road, where an electric motor will pick up the trains drawn by a steam locomotive and run them into Manhattan and Brooklyn. This will mean that the residents of Mineola will have two electric roads to draw from. The cost of the new work, including equipment, will be $5,000,000. It is expected that by Sept. 15 definite announcement will be made as to just when the new work will be commenced. In discussing the problems of the Long Island Mr. Le Boutillier said:

> We borrowed $4,000,000 from the Pennsylvania Railroad on an open account at 5 per cent. We must put this property on a paying basis. How to raise our net income is a problem. One-third comes from freight and two-thirds from passengers, so I determined to raise our commutation rates. There will be 87,000 users of this form of ticket each month this summer, and the net increase for each person would be only $1.87 a month. We carry our commuters at the rate of 4½ mills a mile, and the average haul is 15.1 miles. The great problem we have to face is our short hauls. Forty-eight per cent of our business is from commuters. If we could get rid of our load west of Jamaica, we have enough capacity to take care of everything east of Jamaica for the next 25 years. That is the big problem that is facing us.

Bus Competition Restrained in Brooklyn

The Brooklyn City Railroad and the Coney Island & Brooklyn Railroad, Brooklyn, N. Y., won their fights against competing lines by default on June 8. The Queens Bus Lines, Inc., failed to appear or interpose opposition in Justice May's part of the Supreme Court.

Counsel for the Brooklyn City asked for an injunction against the bus line that ran between Erie Basin and Borough Hall. The Coney Island & Brooklyn Railroad asked for similar relief against the bus line that had been operating between Erie Basin and Park Circle. Both bus lines were suspended a few days after they were started by a preliminary injunction issued by Justice MacCrate. It is believed that the bus lines decided, after the temporary injunction had been obtained, to abandon permanently the lines to which the railroads objected. The injunction was, however, made permanent.

Company After Canal Bed Line at Rochester

Operation of the industrial railroad in the abandoned Erie canal bed owned by the city of Rochester is sought by the New York State Railways. At a conference between James F. Hamilton, president of the railway, and former Senator George F. Argetsinger of the city subway planning committee, Mr. Hamilton frankly stated that his company desires exclusive operation of the lines in the canal bed. If this is denied, neither the city nor the interurban street car lines will be diverted into the city-owned tracks.

Mr. Hamilton pointed out that the electric railways have the equipment and force to begin operation the day the subway is finished, while the city would face an expense of more than $1,000,000 for equipment alone and lacks the necessary personnel. He is expected at an early conference to submit a detailed plan for operation.

The subway railroad uses the old "Big Ditch" of George Clinton through the heart of the city for more than 6 miles. It was proposed to extend the line to the suburb of Brighton. Tracks had been laid and work pushed on this end of the railroad, when Governor Smith's veto of a bill to annex Brighton lands halted that part of the project. Unless legislation is passed providing for the annexation of the needed lands, Rochester & Eastern interurban cars and a city route will be diverted into the canal bed at the southeastern rim of the city.

Canadian Wins Bonbright $5,000 Prize

Names of the winners of the $10,000 in prizes offered by Bonbright & Company, New York, for the best power essay written as of 1930 and covering a ten-year period from 1920 were announced on June 17 at the National Electric Light Association convention in San Francisco.

David Cowan, 21 years old, of English birth and now with the Sun Life Assurance Company, Montreal, receives the first prize of $5,000, while Robert M. Davis, statistical editor of *Electrical World*, a McGraw-Hill publication, was the winner of the second prize of $1,000. There were 438 papers.

John Dockendorf of Milwaukee, Wis., won the third prize of $500.

In addition to the foregoing prizes there remains the cash award of $10,000 to "that contestant whose paper, reviewed again in 1930, shall appear to have most nearly approximated to facts as they eventuate." Thus the winners of the Bonbright award who wrote on five years of past progress in the power industry, and five years of visualized future progress, as well as those whose essays did not take any present awards, have the opportunity of winning a single cash prize of $10,000. The same essays will be rejudged in 1930. The judges are to be the directors of the American Superpower Corporation, who were the judges in the contest just closed.

They are said to have found it difficult to decide which of the first two essays was the better.

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Weekly Pass for Springfield, Mass.

As a means of increasing revenue two plans for the issuance of dated pass tickets good for an unlimited number of rides on certain lines are under consideration by the Springfield Street Railway, Springfield, Mass. One plan involves the issuing of weekly commutation tickets good on a line for any number of trips during a given week. The second new idea concerns a trip ticket good on Sundays for any line in the city any number of times. It is said that this ticket might be sold for 25 cents.

Municipal Difficulties in Louisville May Affect Railway

Action of the Kentucky Court of Appeals on June 12 may have considerable effect on the Louisville Railway, as the decision of the court has unseated 38 Councilmen and park commissioners. Those ousted will have 30 days in which to file an appeal, and as the Court of Appeals adjourns for the summer within a few days, there may be no action on the appeal until fall.

Certain members of the City Council have been rather hostile to the Louisville Railway of late and have not only been fighting a proposal for an increased fare to straight 7 cents, as a result of heavy reduction in the barometer fund, but have urged a 5-cent fare on some lines and questioned the right of the railway to charge certain expenses to the operation where they affect the barometer fund. Complaint was raised to operation of the company's bus subsidiary. Indications are that another Council will be seated before the matter of any change in fares comes up for action.

Seeks Relief from Competition in Huntsville

J. M. Barry, an official of the Alabama Power Company, told the City Council at Huntsville, Ala., recently that unless something could be done to increase traffic the company would ask the commission for permission to discontinue railway service in Huntsville. The matter was referred to the street committee of the City Council. Some time ago the City Council of Huntsville adopted an ordinance putting the jitneys off the streets, but the jitney owners took the matter to the courts and are operating unmolested.

Philadelphia Northeast Transit Subject Before Council

Thomas E. Mitten, chairman of the executive committee of the Philadelphia Rapid Transit Company, Philadelphia, Pa., recently forwarded to the Mayor a letter seeking an extension of the lease for the Frankford L which will expire on Nov. 5, 1927, and also consideration for an extended transit service in the Tacony-Holmesburg section. His letter included a recommendation of the city-company engineers that a bus line instead of car tracks be financed and operated by the P. R. T. between Poquessing Creek and Rhawn Street on Frankford Avenue, to make connection with the Frankford L at a 10-cent fare with a 3-cent exchange ticket, as is now done on the Roosevelt Boulevard. It was his idea that a consideration of the Tacony-Holmesburg extended service could not be intelligently undertaken without a coincident understanding with the city as to the extension of the Frankford L lease. He said consideration of the extension of the Frankford L lease demonstrates that the 1926 rental from the P. R. T. will have to be increased by about $300,000 to satisfy the interest and sinking fund charges on the city bonds.

The letter to the Mayor was read in the Council, as well as another statement containing conclusions of Director of City Transit Ehlers and Ralph T. Senter, vice-president of the P. R. T., regarding the acquisition, reconstruction and operation of the Northeast surface line.

Benefit Association Formed in West Chester

The Chester Valley Lines Employees' Association was recently organized to further the welfare of the men employed in the various departments of the unified electric railway and bus systems of the West Chester Street Railway, West Chester, Pa., to cooperate wth the management in the maintaining of a high standard of service to patrons and wherever possible to assist in improving the service. The new organization is the outgrowth of a movement started some months ago by the management of the Chester Valley Lines to give tangible evidence of its interest in the welfare of the men.

A feature of the plan is the awarding of monthly cash prizes to the employees for the best report containing criticisms of the operation of the railway and bus service and suggestions for economy. Among the benefits is the payment of a sick benefit up to $25 a week on a 50-50 basis, the association paying one-half and the company the other.

At the get-together meeting at which the association was formed Charles B. Cooke, Jr., president, said that the one basic reason for the existence of the company and of the men's jobs was to give the public a fair measure of transportation service in return for the money the people paid in trolley and bus fares.

Arbitration of New York Subway Routes

Mayor Hylan of New York met virtual defeat at a meeting of the Board of Estimate on June 16 when a coalition of Borough Presidents, supported by Comptroller Craig, forced him to postpone action and agree to arbitration on the disputed angles of his $542,000,000 municipal subway program. After a prolonged hearing Mayor Hylan announced that consideration of the plan would be put over until July 1, at which time the Board of Estimate is to convene in special session to dispose of the matter. In the meantime, while no actual committee was appointed, the five borough heads are to confer with Chairman Delaney with a view to ironing out their differences.

More Parking Rules Announced

The St. Louis, Mo., Traffic Council has announced that, effective June 23, all parking on Third Street between St. Charles and Spruce will be prohibited, while on Second Street, Main Street and all cross streets east of Fourth Street, between Washington Avenue and Spruce Street, one-hour parking on one side of the street only will be permitted. Center-of-the-street parking on Twelfth Boulevard with the exception of between St. Charles and Locust Boulevard will also be abolished on July 1.

Committee Approves Referendum for Rainier Purchase

A resolution providing for a referendum rider on legislation to provide for the purchase of the Seattle & Rainier Valley Railway line in Seattle, Wash., until the purchase ordinance has been introduced was passed by the utilities committee of the City Council on June 11. At the previous Council meeting Councilman John E. Carroll offered a proposal for referendum proceedings involving a promise to submit to an advisory vote of the people the Council's offer of $1,200,000 for the railway property before closing the deal. At this meeting Councilman Carroll made an effort to force a vote on his resolution, but it was defeated, the resolution that it be referred to the city utilities and finance committees carrying by a decisive majority.

Tri-City Men Accept Compromise Offer

A general strike of operators of the Tri-City Railway in Davenport, Iowa, and in Rock Island, Moline and East Moline, Ill., as well as suburban communities served by the lines, was averted on June 13 when the men voted to accept the compromise offer of the railway. Thus the present wage scale of 58½ cents an hour will continue until June 1, 1926. The wage question cannot be opened prior to Nov. 1, 1925, and then must be arbitrated if not agreed upon. This was a concession to the men, the company having held out for a 30-day reopening clause.

A contract covering working conditions and similar to that now existent will continue from year to year, unless opened after a year from date on 30 days' notice. The company contended that its receipts were constantly falling below expenditures and that it could not be bound for a year.

Detroit United Seeks Fare Increase

The Security Trust Company, receiver for Detroit United Railway, Detroit, Mich., has applied to the Public Utilities Commission for authority to increase fares to 3 cents a mile. The highest present fare is 2½ cents a mile. A statement of earnings and expenses filed with the petition shows the Detroit United Railway failed to meet expenses, depreciation, maintenance and 7 per cent return in the year ended Dec. 31, 1924, by $1,707,320 and by $342,791 in January and February this year.

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Recent Bus Developments

New Haven Road Recognizes Bus—Richmond Property Unifies Railway and Bus—Cleveland Service in August

THE New York, New Haven & Hartford Railroad is going into the bus business. Formal announcement to this effect was made on June 16. The company finds that there are some portions of its system which cannot be operated economically even by gasoline cars for passenger service with the frequency of service desired by the public. Where such conditions exist, the company intends, so far as possible, to continue to perform freight service and such passenger train or gas rail car service as may be required, and to operate over parallel highways with buses.

In addition there are other points on its rail lines now reached by circuitous runs, compared with the distances over the recently constructed highways. It is the company's plan to consider highway bus service between these points. Says the railroad:

> This policy of the company is to be carried out with the intention of furnishing an adequate passenger service in connection with its rail lines; to give to the public the accommodation which the demands of its patrons required, and to use that mode of transportation which is the most efficient, economical and best adapted to the performance of good service.

A subsidiary company, the New England Transportation Company, has been created through which the arrangements for plant and equipment will be promptly progressed. Routes and service will be developed and the approval of the state commissions will be sought.

Stone & Webster, executives of the syndicate which has acquired control of the Virginia Railway & Power Company, Richmond, Va., will assume control of the Richmond property with the idea of bringing about unification of the motor bus and railway transportation services, according to recent statements in the *Times-Dispatch*. In reply to a question as to their attitude toward the proposed acquisition of the Richmond Rapid Transit Corporation, Stone & Webster sent the following telegram:

> Answering your telegram: Our view is that a growing and progressive city absolutely requires a unified and co-ordinated transportation system.

When this telegram was read to him, W. L. Warren, president of the Richmond Rapid Transit Corporation, said that his company was "perfectly willing to listen to any proposition which the new owners of the Virginia Railway & Power may make." He is quoted:

> However, I am morally certain that a majority of the stock owners would not give serious consideration to any offer which lists the same terms submitted by the Mack Truck people. The directors of our corporation are citizens of Richmond who want to do what is best for the city. We agree with Stone & Webster in that a unified system of transportation is the logical solution of the problem, and we are willing to settle on a fair basis. Meanwhile, the service which we inaugurated for the benefit of the city has become profitable and will remain so unless we are subjected to unfair competition.

H. V. Godbold, vice-president of the corporation, said that the corporation was entirely satisfied with its present operation, but that the directors would not stand in the way of a unified transportation system if they were offered a fair price.

Bus operation by the Cleveland Railway, Cleveland, Ohio, will not be started until some time in July. Only a few buses are expected to be put in service then, and not until some time in August will buses be put on major service lines. Bus service is authorized by the Collister-Krueger law, under which, effective on June 15, home rule was applied to municipalities in bus transportation.

Interurban bus service between Rockford, Ill., and Janesville, Wis., has been started by the Rockford & Interurban Railway. Rockford Aldermen granted a city terminal route only a few days before the plan became effective. Seven cars are run each day. They cover the route in 85 minutes. Train connections are made for Madison, Milwaukee, St. Paul and Duluth.

The Tama & Toledo Railroad, Toledo, Iowa, discontinued its passenger service June 17. A bus service was placed in operation between the two cities.

The St. Louis Board of Public Service has granted the St. Louis Bus Company, subsidiary of the United Railways, a special permit to operate buses on De Baliviere Avenue between Delmar Boulevard and the Municipal Theater in Forest Park during the ten weeks' summer opera season. The permit to the St. Louis company is restricted to theater hours. The St. Louis Bus Company interchanges transfers with buses of other lines of the company and with the street car lines.

The City Council of Davenport, Iowa, has rejected the proposal of the Tri-City Railway to substitute bus service for railway service on the Mount Ida and Fejervary park lines. This action was taken after the committee met and considered the proposal of the company to abandon car tracks on streets scheduled to be paved this season. The opinion of the committee was that the company should be required to carry out provisions of its franchise and agreement entered into with the city regarding the widening of Bridge Avenue.

The Board of Park Commissioners, Baltimore, has received an offer from the United Railways & Electric Company to operate buses to the central section of Druid Hill Park. In the company's proposition it was stated that a 5-cent fare would be charged from the entrance of the park to the interior.

The Chicago & Joliet Transportation line, operating buses in supplementary service to the Chicago & Joliet Electric Railway, has filed a petition for authority to operate a bus line through the west central residential district of Joliet, Ill.

The Rochester Interurban Bus Company, owned by the New York State Railways, has petitioned the State Public Service Commission for the right to operate a bus system in western New York. The company, purchased last winter from an independent, operates between Rochester and Hornell. It is proposed to open lines connecting Rochester with Livonia and Lakeville and with Silver Lake, a summer resort 45 miles south of Rochester, and to open a line from Lakeville and Long Point on the west side of Conesus Lake. At a recent hearing before I. C. Ward, assistant counsel for the state commission, attorneys for the Erie and other railroads opposed the application, charging that the New York Central, which controls the New York State Railways, is seeking to extend its territory by acquiring control of virtually all western and central New York bus and electric lines.

The division of franchises of the Board of Estimate of New York City filed a report with the board on June 15 which recommended that most of the 46 applications for franchises to operate buses in New York City be returned to the 38 applicants for revision and correction. The report itself was noncommittal as to the relative merits of the applicants and merely stated that the applicants for bus operating franchises "seem to have failed to understand what information was desired." This report was referred to the Board of Transportation and will be taken up at the next meeting. Among the applicants were several street railways.

The Tennessee Electric Power Company has recently established a bus line in the section of Chattanooga east of Missionary Ridge. The decision to start this service to territory not now being served by the railway was reached after several months of careful investigation. The plan calls for two lines. Five buses were purchased by the company at an initial expenditure of about $50,000.

The Massachusetts Coach Company, an independent bus company, and the Boston Elevated Railway, Boston, Mass., recently reached an agreement whereby they operate on regular schedules, meeting bus for bus, affording a practically continuous journey to East Milton and West Quincy. The independent corporation operates Mack buses on a route between West Quincy, East Milton and the Boston city line. The Boston Elevated discontinued trolley service on the Adams Street-Dorchester line and substituted five buses to take care of the traffic. Fare on the 3-mile route of the Boston Elevated is 6 cents and on the 3½-mile route of the coach company is 10 cents or a strip of ten tickets for 75 cents.

Three Mack buses have been received by the Bloomington, Ill., division of the Illinois Power & Light Company for use on the South Main Street line during new railroad viaduct construction work. The buses, however, are to become an integral part of the traction system and will be used as feeders for the lines and in sections not now regularly served.

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The North Carolina Public Service Corporation recently established bus service in Glenwood, in order to give the people of that section of Greensboro means of transportation while the company is tearing up and relocating its tracks through Glenwood.

The Skippack & Perkiomen Transit Company, Norristown, Pa., recently ceased to function. Three rich agricultural sections of Montgomery County will be served with transportation facilities by the Montgomery Bus Company, which has started its service over the old route of the transit lines.

The Chicago, Milwaukee & St. Paul Railroad with 646 miles of electrified line, has started bus service at several points as auxiliary to its steam trains. Following the receipt of formal approval of its bus plan by the Interstate Commerce Commission, the railroad, will operate its first bus line in Wisconsin between Racine and Sturtevant, in the southern part of the state, and another line in the northern part of the state between Minocqua and Boulder Junction. The buses will meet all trains. Train service on the Racine and Minocqua subdivision will be limited to freight and express business.

Mayor Ulrich Wiesendanger of Yonkers, N. Y., on June 13 granted the Yonkers Railroad, a subsidiary of the Third Avenue Railway, New York, a certificate to begin operation of buses on three of the five streets on which it has discontinued its railway lines. The bus fare is to be 10 cents. Some weeks ago the right to operate twelve bus routes in Yonkers was granted to the Westchester County Bus System, Inc. Later the Mayor announced that he had decided to veto the ordinance passed by the Yonkers Aldermen to give the permit for the sole operation of buses in Yonkers to the Westchester County Bus System, Inc.

The Public Service Commission has approved the schedule of the new line of the Binghamton Railway Bus Lines, Inc., operating in Johnson City, N. Y. The fare for adults and children is 7 cents. The Binghamton Railway has filed a tariff, effective July 1, 1925, providing that passengers paying regular fare to Johnson City will, upon request, be given transfers to the Binghamton Railway Bus Lines, Inc. Transfers so given will be accepted for the same transportation as would be given upon the payment of the line's regular cash fare. Passengers paying the regular fare for transportation on the bus line in Johnson City will be given transfer to the Binghamton Railway, which will be accepted for the same transportation as would be given upon the payment of a regular cash fare of 7 cents.

The board of the town of Salamanca, N. Y., recently refused the petition of the Olean, Bradford & Salamanca Railway to operate buses through the town on its proposed route from Little Valley to Salamanca. Supervisor L. B. Hall produced a letter from Mr. Benedict, president of the Iroquois Indian Trail Motor Coach Company, Buffalo, in which he expressed opposition to granting the franchise.

News Notes

Requests Seven-Cent Fare.—E. Randolph Williams, counsel for the Virginia Railway & Power Company, Richmond, Va., made oral request to the State Corporation Commission on June 11 for a 7-cent fare with a 3½-cent fare for school children, pending the fixing of a permanent rate of fare. Mr. Williams said the company was not earning 6 per cent even on the lowest of the three valuation estimates submitted to the commission. It is expected the commission will rule on the permanent fare by July 15.

Wants Fare Reduced at Midnight.—The City Council of Montreal, Que., has adopted a resolution to the effect that the Tramways Commission be requested to consider the advisability of reducing the fare between midnight and 5 a. m. from 15 cents to 10 cents; further, that as far as the city is concerned the commission should be informed that it agrees to this reduction. The resolution was adopted on the suggestion of Alderman Brodeur.

By-Law for Improvements Approved.—The Sandwich Council at a recent special meeting approved a by-law submitted by the Hydro-Electric Power Commission of Ontario authorizing the issuance of debentures for $70,000 covering street railway extensions in the county town. The debentures will not be sold, but held as collateral. By-laws were passed authorizing local improvements to cost about $125,000.

Will Vote on Cars or Buses.—The town of Weston, Ont., will vote on June 27 on the question of continuing the present railway service or using buses. The by-law to be presented to the people will be on the purchase of the Toronto Suburban Railway for $25,000, the understanding being that if the by-law is voted down the town will resort to a system of bus service.

Will Raise Fares.—The Southwestern Gas & Electric Company has informed the City Councils of both the Arkansas and Texas sides of Texarkana that it will put in force 7 and 4-cent fares within the next 30 days, raising the rates from 5 and 2½ cents. The company says it has been losing money annually for several years.

Will Ask for Increase in Fares.—The Quincy Railway, Quincy, Ill., operated by the Illinois Power & Light Corporation, is preparing to ask the Illinois Commerce Commission for authority to increase its fares from 7 to 10 cents and its ticket rates from four for 25 cents to five for 35 cents. School children fares of 2.5 cents will remain unchanged. The Quincy Chamber of Commerce indorsed the proposed increase. The company has abandoned plans for extensions of lines this year inasmuch as the South Eighth Street bus line will cost $73,000 and other improvements on South Eighth and State Streets will run to $100,000.

Seeks to Run One-Man Cars.—Application has been filed by the Wisconsin Rapids Street Railroad, Wisconsin Rapids, Wis., with the Railroad Commission for permission to establish one-man car service on its interurban line between Wisconsin Rapids and Nekoosa.

"All-Day" Ticket.—To popularize trolley and bus riding and to stabilize travel at all hours of the day, the Chester Valley lines, consisting of the West Chester Street Railway and its bus subsidiaries, has issued an "All-Day Ride-as-You-Please Ticket." This is good for passage, on the date indicated, over any and all of the 250 miles of electric railway and bus routes operated by this system in Chester, Delaware and Montgomery Counties, Pa., and Upper New Castle County, Del.

Levis Adds Weekly Pass.—The Levis County Railway, Levis, Que., added the weekly pass on May 17 at $1 for use on its single-fare routes. These routes have a cash fare of 10 cents and a ticket fare of four for 30 cents.

Withdrawal of Railway Service Protested. — Residents of Merchantville, N. J., held a mass meeting recently and protested against the proposition of the Public Service Railway to abandon its railway east of Franklin Street in that town. Martin Schreiber, general manager of the company in South Jersey, said that if the company were permitted to abandon the line a number of buses would be placed in service in addition to those now operated. He said the company would not try to force the people to agree to the change proposed, but that the matter was one for the Board of Public Utility Commissioners to settle.

Plans Ahead for Interstate Bus Bill.—A bill, formidably supported, will probably be introduced in the next session of Congress with the object of regulating the operation of buses engaged in interstate commerce. The purpose will be to prevent "unfair competition" with the railroads.

Petitions for 5-Cent Interurban Fare.—The Fort Smith Light & Traction Company, Fort Smith, Ark., has petitioned the Railroad Commission for permission to establish a new 5-cent interurban fare between Fort Smith and Van Buren, Ark., in addition to the fare charged within the cities.

Privileges to Increase Traffic.—In an effort to build up its patronage the Bakersfield & Kern Electric Railway has put into effect the weekly pass in Bakersfield, Cal. In addition to popularizing the system through this cheap fare the company has announced an extension of transfer privileges for outbound Baker Street passengers. The decision to extend the transfer limits from the Southern Pacific station to the corner of Baker and Kentucky Streets was announced by Superintendent Mickelberry, who said that the change would be particularly advantageous to cash and token passengers. It has been urged upon the citizens of Bakersfield to ride the street cars whenever opportunity presents to escape "the fate which has befallen Phoenix and other cities which have lost their street car systems."

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Foreign News

Moroccan Railway Progress

The inauguration of the electrified railway line from Casablanca to the capital Rabat took place on April 21. The line crosses the Bou Regreg on a steel bridge 203 m. in length and passes under the city of Rabat by a tunnel 1,200 m. long, thus preserving the beauty of this garden city laid out on the lines of the French engineer Proust since the French occupation in 1912.

In 1920 the Compagnie des Chemins de Fer du Maroc received a concession for the construction and operation of 1,000 km. of line. Of this the spur from Casablanca to Rabat, 85 km., is the first to be put into operation. This connects the chief commercial city and seaport with the capital and forms a part of the line Casablanca-Kenitra (125 km.), of which the section Kenitra-Rabat has already been operating with steam power for two years.

The railways of Morocco for some years are destined to be trunk lines, which will be fed for the most part by auto truck and stage services, the rail being used only for the bringing of phosphates and farm products to tidewater at the Atlantic ports of Kenitra, Mehedaya, Fedallah and Casablanca.

Austria Receives $18,000,000 for Electrification

The finance committee of the League of Nations has released $18,000,000 from the League's loan to Austria to be used for the electrification of the Austrian railroads. The government originally asked for $25,000,000. Dr. Zimmermann, the league commissioner, opposed the use of the money for this purpose, and the league's decision represents a compromise favorable to Austria.

The money is to be used to electrify the Tyrolean Railroad from Salzburg to Brudenz and the Brenner line. They connect Austria with Italy and Switzerland and are most important from a commercial and tourist viewpoint. The proposal to electrify the famous Semmering line, connecting Vienna with the most popular mountain resort, was refused on the ground that the railroad was for luxury purposes.

Electric Auto Bus Develops in France

Further development of the electrically propelled auto bus appears to be imminent on a grand scale in France. The Renault firm is producing an electric bus for town use, fitted with accumulators, or batteries, put out by the Dinin firm, which is expected shortly to have its trial on Paris streets. Lyons, in mid France, now has twelve electric buses in service, described in the ELECTRIC RAILWAY JOURNAL, issue of Feb. 14, p. 276. The subject of electric buses for France is being pushed forward by that puissant association the Society for the Development of Electric Vehicles. Since the war this body has been actively engaged in encouraging the development of charging stations, particularly in the Paris and Lyons districts.

Speed Reduced on Paris-Orléans

Due to two recent accidents on the Orléans line, caused in each case, it is believed, from too high a speed during the period of re-laying the lines and installation of electric equipment, the French Minister of Public Works has ordered an immediate reduction of speed of 25 per cent on all parts of the line where work of any nature is being carried on. In no case can the speed exceed 80 km. (50 miles) an hour.

Electrification Progress on the Midi Railway in France

The Midi Railway, paralleling the French slope of the Pyrenees in southern France, is perhaps the first French railway (of a total length of 4,116 km.) to carry out its entire electrification scheme, or at least is in advance of that of other French lines still working out the same problem. In the Valley of the Ossau the Hourat generating station is ready for operation. The Miegebat station will be ready shortly. The 150,000-volt system of transmission lines is completed and is working provisionally at 60,000 volts.

Electric trains are circulating from Toulouse to Dax with branch lines to Pierrefitte, Bagnères de Bigorre and Arreau. The electrification of the line to Luchon, a watering place, will be completed the coming summer.

The electric installations on the important sections from Dax to Hendaye at the Spanish frontier and from Bordeaux to Irun in Spain are already completed, and trials will be carried out soon to endow these important traffic sections with a new, fast and more frequent service. From Dax to Bordeaux to Archachon will see the completion of the electric installation during the present year. In all, the sections under electric operation or soon to be so operated total 500 km., by far the most pretentious installation of its kind in France.

There are 55 electric locomotives under construction and fifteen electric motor cars. Electric lighting has been installed during the past year in 220 passenger coaches, in conformity with a law which provides that electric lights shall be installed in all passenger-carrying cars before 1927.

The auto-bus feeder services of the company running through the high valleys of the Pyrenees and elsewhere in proximity to the line are in full operation, but owing to the climatic conditions of the past summer have not given the returns expected.

Wireless on Tram Cars.—Tram cars in Stockholm have been equipped with wireless, so the journeys are now enlivened by concerts and bulletins of the latest news.

Abandonment Under Consideration.—An inquiry was recently held into the application made to the Ministry of Transport by the Dudley, Stourbridge & District Electric Traction Company to abandon its tramway in the Kingswinford area. The reason, it is stated, is that the tramway does not pay. If abandoned, it will cut out an important section of tramways running through the Black Country.

New Polish Tramway Project.—Construction of the new electric tramway from Warsaw to Zatrardow, a distance of 28 miles, is being financed by the Power & Traction Finance Company, Ltd. The estimated cost of this construction is £600,000.

Station Train Indicators on London Underground.—The illuminated frames at stations on the Metropolitan District Railway showing the destinations of the next three trains has proved so successful that the scheme is being extended to some of the tube railways. In the past there was no need for such an arrangement on the tubes, as with one exception they had no branches or junctions. Through recent developments the state of simplicity has to some extent gone, particularly on the two lines now interconnected, the Charing Cross & Hampstead and the City & South London Railways. On these the companies are installing a complete system of station and signal cabin automatic indicators.

South African Railways to Electrify.—Electrification of the suburban lines of the South African Railways from Capetown to the naval port of Simonstown and the seaside resorts of Kalk Bay and Muizenberg and from Capetown to Sea Point is to be started soon. Contract for the electrical equipment has been awarded to the English Electric Company. The value of the contract is estimated at £350,000 and includes equipment for 83 motor and 133 trail cars.

Electrification Scheme Progresses.—Recent United States Commerce Reports refer to a report that an estimate of about 33,000,000 rupees for the electrification and doubling of the lines of the South Indian Railway in the suburbs of Madras has been sent to the home board by the authorities of the railway at Trichonopoly. It is said further that as soon as a reply is received the estimate will be forwarded to the railway board at Delhi for the necessary sanction.

Electrification Agreement Recorded.—The *Journal Officiel* of the Société des Tramways Bretons publishes under date of May 1, an agreement for the electrification of the interurban lines of the Breton Tramways from St. Malo to St. Servan and Paramé on the north Breton coast. It is assumed that the local authorities will be willing to allow the state to control the enterprise. The district served comprises three important summer resort towns, where the present steam tram facilities are found utterly unable to cope with the increase in summer traffic.

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Financial and Corporate

Seattle Municipal Railway Deficits Explained

D. W. Henderson, general superintendent of the Seattle Municipal Railway, Seattle, Wash., gave out a statement on June 10 explaining the deficit of $68,789 shown on the records of the lines for the first four months of this year and the cumulative deficit of $615,928 with which the lines finished the year 1924. He said that the deficit of $68,789, referred to in the *Times* of June 3, did not represent any loss in operation or affect the finances of the railway. It represented merely a plant loss due to the tearing up of "dead car tracks." According to Mr. Henderson the road is meeting all obligations and reducing its deficit.

With respect to the item which appeared in the *Times* on the deficit of $615,928, Mr. Henderson said the paper did not say that during that same year the deficit had been reduced $369,431.

He said it was a matter of common knowledge that during the first years of municipal operation under inadequate fares the system ran heavily in debt. The deficit at the end of 1920 was $1,814,163. Under the adequate 8½-cent fare the deficit had been reduced to $877,491 at the end of 1922. In 1923 another three months' experiment with the 5-cent fare was made. This resulted in a decrease of revenue of $512,713 for the year compared with 1922, although the deficit increased only to $985,359 due to economies in operation. If it had not been for the experiment with the 5-cent fare in 1923, he thought the railway deficit would have been virtually wiped out by now. Even with that setback the railway reduced the deficit of $1,814,163 in 1920 to $615,928 at the end of 1924. Mr. Henderson said:

> We have met all operating costs, interest on bonds and bond payments and have reduced our deficit $1,198,235 during the last four years.
>
> The municipal railway belongs to the people of Seattle. They are entitled to the facts regarding its operation and finances. We desire the friendly co-operation of the press and of the people of Seattle in making the railway successful.

Dividend Action Deferred at Duluth

Directors of the Duluth-Superior Traction Company, Duluth, Minn., at their recent meeting deferred action in regard to a distribution of the common shares. It was felt that the recent showing in regard to gross income did not warrant action at this time and the matter was left over until next quarter. Earnings are said to be better than a year ago, but not quite so good as in 1923. In Duluth the improvement for May was about 12 per cent, but in Superior the earnings showed a decline of about 5 per cent, cutting the general improvement below the 10 per cent, which it was hoped to be able to maintain. According to the *Canadian Financial Post*, from which these facts are taken, the automobile has created Duluth-Superior's main problem. Not only is there jitney competition to be considered but the ever-increasing number of car drivers cuts seriously into traffic returns. The company is still experiencing some competition from jitneys in Superior, while in Duluth, where the jitney competition has been restrained, there is still the issue of the increased fares, and until it is settled the margin of profit on operation is a doubtful quantity even though gross returns are showing a nice increase.

Income Tax Ruling

No Deduction for Losses Permitted While Subsidiary Continues as Active Entity

The United States Board of Tax Appeals handed down a decision on May 20 in the appeal of the Portland Railway, Light & Power Company Portland, Ore., from a ruling of the federal income tax commissioner.

The first point considered in the decision was in connection with advances which the railway company, whose name is now the Portland Electric Power Company, made each year from 1915 to 1924 to the Willamette Valley Southern Railway. The Portland Electric Power Company owns all of the preferred stock of this company and about 55 per cent of its common stock, and it has also guaranteed the payment of interest and principal on its bonds. The Willamette company has shown continual deficits which have had to be met by advances from the Portland company mentioned above, and these advances the Portland company wishes to charge off as losses on the ground that the Willamette company is insolvent. The Board of Tax Appeals decided, however, that this cannot be done "so long as the corporation to which such advances are made continues as an active corporate entity, is not actually adjudged bankrupt and no effort made to close or liquidate the account."

Another claim for deduction by the Portland company was in regard to the sale at a loss of some real estate purchased in 1907 at $119,628 and sold in 1920 at $88,000. The fair market value on March 1, 1913, was $151,538, and the company claimed the difference between the sales price and this latter figure, less $4,531 depreciation. The commissioner, however, deducted the sale price from the cost price and also deducted the sum of $10,373 for depreciation in 1907. This left only a loss of $21,255 as against a loss of approximately $59,000, claimed by the Portland company. On this point, the action of the commissioner in choosing between the basis of March 1, 1913, or cost, whichever gave the lower figure of loss, was sustained, on the basis of the decision of the United States Supreme Court on April 13, 1925. There was no dispute as to the amount of depreciation to be deducted for each year.

Memphis Gross and Net Earnings Off

The National Power & Light Company, New York, holding company for utilities serving 47 communities in Tennessee, Alabama, Arkansas and Texas, did a gross business of $22,886,444 in 1924, according to the annual report, an increase of 9½ per cent over 1923. Net earnings were $8,063,330, an increase of 15 per cent.

Of the earnings of subsidiaries, 50 per cent was derived from electric power and light services, 38 per cent from railway service and 12 per cent from manufactured gas and miscellaneous service. The subsidiaries reported 212,933 consumers, of whom 158,463 were electric and 54,470 were gas customers.

During the year the properties of the Birmingham Railway, Light & Power Company, the Bessemer Gas Company, Birmingham-Tidewater Railway and the Norwood Street Railway were acquired by the Birmingham Electric Company, which was organized for this purpose.

The only strictly street railway property of importance reporting is the Memphis Street Railway. It runs 183 miles of line and carried 53,985,680 passengers in 1924, 56,073,749 in 1923 and 56,035,125 in 1922. A statement of earnings for the year ended Dec. 31, 1924, compared with the previous year, follows:

STATEMENT OF EARNINGS OF MEMPHIS STREET RAILWAY

	1924	1923
Gross earnings from operation	$3,014,674	$3,154,526
Operating expenses, including taxes	2,121,690	2,189,370
Net earnings from operation	$892,984	$965,156
Other income	3,628	9,478
Total income	$896,612	$974,634
Interest on bonds	454,195	480,043
Other interest and deductions	8,890	30,206
Balance	$433,527	$464,385
Dividends on preferred stock	125,000	100,000
Balance	$308,527	$364,385
Renewal and replacement reserve	277,125	228,932
Balance for surplus	$31,402	$135,453

Seattle Seeks Stay in Tax Case

Seattle's Assistant Corporation Counsel, George Meagher, recently asked Federal Judge Neterer for a stay of proceedings in the suit of the Puget Sound Power & Light Company against the City of Seattle, Wash., to collect from it three-quarters of the tax on the Seattle Municipal Railway system for the year in which the system was taken over by the city. The court refused, holding it was premature as the mandate in the suit from the Circuit Court of Appeals had been returned to the higher court for a retaxing of the costs.

The city is asking for a stay of proceedings in the District Court pending the filing of an application for a writ of review from the Circuit Court findings to the United States Supreme Court. The case was carried to the Circuit Court of Appeals upon a decision of Judge Neterer sustaining a demurrer filed by the city and the county,

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which were made joint parties to the action. The Circuit Court reversed Judge Neterer in so far as the suit affected the city, but sustained him relative to the county, dismissing the action against that municipality.

The Puget Sound Power & Light Company is suing to collect from the city, under the provision of a city ordinance, three-quarters of the taxes levied against the street car system and paid by the company under protest.

Denver Reorganization Plan Declared Operative

Official announcement was made on June 9 that the reorganization plan for the Denver Tramway, Denver, Col., had been declared operative and that the securities to be issued in the reorganization already have been underwritten. Under the official decision of the reorganization managers in declaring the plan operative, the reorganization will probably be effective as of July 1.

The reorganized company will be headed by Ernest Stenger, the present receiver for the tramway under the United States District Court and president of the company before it was forced into a receivership.

Claude K. Boettcher, one of the reorganization managers, said:

Security holders gave almost unanimous approval of the plan by depositing their stocks and bonds. I believe that the security holders were more nearly unanimous in support of this plan than any ever presented before in any similar instance.

What few of the securities have not already been cared for have been underwritten by a few of the large owners, a simple matter in view of the response of the stockholders. In addition to the securities already deposited, more will be coming in within the next few weeks. Many bond and stock owners are in Europe at the present time and will deposit their securities as soon as possible. The time limit for security holders to participate in the plan by depositing their securities has been extended to July 15.

The trustees for the bondholders are now preparing the necessary papers for filing in the federal court in foreclosure of the present company as the next important step in the reorganization. This will be done as soon as possible.

Later a decision will be made as to the name of the new tramway company, which will be as nearly the same as at the present time as possible. It is possible we may go into another state to incorporate and keep the same name.

Detroit Financial Plan Announced

Forty per Cent Assessment Proposed—Execution of Plan Urged by Receivers—Unsecured Creditors Get Bonds—Foreclosure Would Follow Failure of Stockholders to Support Plan

A SPECIAL meeting of stockholders of the Detroit United Railway, Detroit, Mich., has been called for June 29 to vote on proposed issues of stocks and bonds and to consider the exchange of the present outstanding common stock for three issues of new stock, all to be put out as part of the plan for the reorganization of the railway.

The plan for refinancing the railway, which went into receivership last March, was mailed to stockholders and unsecured creditors by the receivers in Detroit on June 12. Under the plan general mortgage bonds not to exceed an aggregate principal amount of $8,000,000 will be issued to cover all the property of the corporation. The bonds will bear 6 per cent interest.

Of the $8,000,000 bonds, stockholders are asked to subscribe $6,150,000, and the remainder is to be taken up by unsecured creditors. Subscriptions would be payable in one-fifth installments monthly, beginning June 26 next.

The stockholders will vote on these questions:

(a) Considering creation of an issue of preferred stock, bearing cumulative dividends at rate of 3 per cent the first year, 4 per cent the second year, 5 per cent the third year and 6 per cent annually thereafter. An issue of two classes of common stock, to be known as class A and class B, of which class A shall be entitled to dividends of 7 per cent in any year before any dividends on class B in such year, but shall not participate in any further dividends in such year.

(b) Considering and voting on authorizing and requiring exchange of present outstanding common for said three issues of stock.

(c) Considering authorization of general mortgage bonds, not to exceed an aggregate principal amount of $8,000,000, bearing interest at the rate of 6 per cent annually, covering all the property of the corporation.

(d) Considering and voting on any modifications or additions to the foregoing that may be required.

(e) Considering accepting of articles of association so as to make such capital readjustment effective as of July 1, 1925.

(f) Considering a resolution to make provision for canceling of old and issuing new certificates, and on any other matters that may come before the meeting, whether incident to or in connection with matters and things aforesaid or otherwise.

A. L. Drum & Company, consulting engineers, retained by receivers, have succeeded in paring down expenses to the point where a fair profit is expected to be shown by the end of the current year. Drum & Company estimate the financial results of operation of the lines for the twelve months from July 1, 1925, to June 30, 1926, as follows:

Gross earnings	$7,957,636
Operating expenses and taxes	6,342,348
Net from transportation	$1,615,288
Other income	960,000
Net available for interest and depreciation	$2,575,288
Interest on existing bonds, after deducting $649,700 interest received from city of Detroit	1,020,000
Excess of interest received from city of Detroit allocated to excess bonds	208,000
Sinking fund payments	650,000
Total	$1,878,000
Balance available	$697,288

The estimate is predicated upon the following:

1. That a reorganization plan be adopted and be effective by July 1, 1925, at least to the extent of providing the funds required by the receivers estimated at $1,660,953.

2. That increased revenues in the amount of $1,010,000 for the twelve months will be derived from an increase in the rates of fare for interurban and city traffic.

3. That the total operating expenses for the twelve months will be $1,525,000 less than for the twelve months of 1924.

The sinking fund payments of $650,000 a year made from the rail earnings are more than sufficient to offset the accruing depreciation of the rail property.

The engineers explain that this forecast of the net earnings to be expected during the first year of operation of the reorganized property is based upon probably the minimum number of passengers that will ever under normal conditions be carried by the property; as the estimated number of passengers is 23.6 per cent less than the passengers actually carried in 1923, and 17.7 per cent less than the passengers actually carried in 1924. They say it is fair to assume that the large portion of this decrease in traffic, which is due to the present industrial depression, will be regained in future years and will contribute a substantial increase in the future net earnings of the property.

The receivers deem it necessary to provide for the immediate payment of a part of claim and other obligations amounting to $1,660,000 and that provision should be made for the payment of the balance, amounting to $950,000 over a period of a few years. They also feel that provision for these payments is necessary because they have a direct bearing on the receivers' ability to effect economies and increase revenues. No portion of the $1,660,000 immediately needed can be taken from operating revenues. In fact, the receivers have already used operating revenues to some extent and the operating funds must be reimbursed.

It was to this end that Judge C. Simonds, in the United States District Court, authorized receivers to issue certificates to the amount of $1,660,953. The certificates are to become payable July 1, 1926, and will be based on a lien on the D. U. R. property exclusive of that sold to the city of Detroit under the contract of March 10, 1922, which is specifically protected by the court order.

The right was reserved by the court to issue another order authorizing the receivers to issue more certificates to bring the total up to $1,800,000. The money derived from the certificates, according to the original application, is needed to meet requirements including the following: Changes and improvements, $184,056; land contracts, $241,210; miscellaneous, $173,000; probably unavoidable requirements listed as miscellaneous, $163,974; Wyondotte division, $160,300. The requirements for buses include an amount of $679,599 for equipment and $185,000 to complete payment for the Star Motor Coach Line and $66,550 in connection with the purchase of a majority of the stock of the Public Service Transit Company.

In a statement to the unsecured creditors of the railway the receivers say, in part, in referring to the demands made on the stockholders in order to protect their equity:

It will be noted that the stockholders are called upon to subscribe and pay for in cash at par general mortgage bonds in an amount equivalent to 40 per cent of the par value of their stock. (There is $15,375,000 of stock outstanding.) No set of stockholders could reasonably be expected to do more. No lesser amount would be adequate. This amount will be sufficient if the creditors co-operate as contemplated by the plan. The new general mortgage bonds will rank next after the first mortgage and collateral trust sinking fund five-year 6 per cent bonds, of which $7,775,000 are now outstanding, against which there is up as collateral $2,000,000 of the 4½ per cent bonds which are being paid with the moneys paid by the city of Detroit on the purchase of the city lines. When, on July

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1, 1929, the above-mentioned 6 per cent bonds all mature and are paid off the general mortgage bonds will then become first mortgage bonds. The plan to be successful further requires that the unsecured creditors shall take these general mortgage bonds in payment at par for their claims. Thus the present indebtedness will have the same standing as the new money.

The executed subscription agreement must be in the hands of the depositary not later than June 26, 1925. The time is short, but at least $600,000 must be in the hands of the receivers by July 1 and the other $1,000,000 then assured to be forthcoming as and when required. If the plan does not become operative because of lack of sufficient support by stockholders and creditors, there will of course be no funds from that source to take up the receivers' certificates. It was absolutely impossible for the receivers to work up definite and reliable data and information at any earlier time. If this plan is not supported, the receivers will be required to finance the certificates from some other source and also there will be no alternative but a sale of the property in due course of time under the decree of the court.

It will be understood that the plan is in no sense the receivers' plan, but the receivers have felt it their duty to the creditors to assist the stockholders in putting out the very best plan that the stockholders could possibly carry through. The receivers have also felt it to be their duty to make clear the merits of the plan and the conditions under which it is put out. Having done this to the best of their ability, it is for the creditors to consider and determine for themselves between subscribing to the plan or being able to protect themselves on a sale of the property.

The statistical record of the company has been reduced to the accompanying presentation:

CAPITALIZATION

	Authorized	Outstanding
Common stock	$25,000,000	$15,375,000

FUNDED DEBT

4½ per cent bonds, due 1932	$11,000,000
Underlying bonds on property	857,000
6 per cent first mortgage gold bonds	8,472,000
Underlying bonds of subsidiary companies	8,325,500
6 per cent collateral trust notes, due 1926	325,000
Gen. equipment trust certificates "A" due 1934	1,000,000

DIVIDEND RECORD

Year	Per Cent	Year	Per Cent
1901	4	1914	6
1902	4	1915	6
1903	4	1916	6⅔
1904	4	1917	7⅔
1905	4½	1918	8
1906	5	1919	8
1907	3¾	1920	8
1911	5	1921	2+2½
1912	5	1922	1½
1913	6	1923	3
		1924	3

MARKET RECORD

	—Common—	
Year	High	Low
1912	76½	55½
1913	80⅞	62¾
1914	73¾	62
1915	73	69
1916	128½	69
1917	128	104⅜
1918	....	....
1919	113	93
1920	113¾	79¾
1951	96	50
1922	73	54
1923	79½	56
1924	72⅝	19⅛
1925	29	3¼

Insull Interests Buy the Manchester Traction

Negotiations for the purchase of the Manchester Traction, Light & Power Company, Manchester, N. H., by the Middle West Utilities Company have been completed, it was announced on June 17. The purchase price approximates $7,500,000. The sale is contingent on the securing of 55 per cent of the stock by the Middle West Company by July 15.

Letters will be mailed to every shareholder recommending the acceptance of the offer of $150 per share made by the Insull interests. There are 49,500 shares of stock scattered throughout New England.

Won't Allow Track Removal.—The Arkansas Railroad Commission has refused the petition of the Fort Smith Light & Traction Company, Fort Smith, Ark., to remove track from the city limits of Van Buren to the Falcon Zinc & Smelting Company's plant. The company has filed an appeal in the Circuit Court. It alleges that the operation of that part of the line should be discontinued on account of the increased use of the automobile.

Seeks Foreclosure and Receiver.—Suit to foreclose a mortgage on the Tiffin & Fostoria Railway and for appointment of a receiver was begun in Common Pleas Court at Tiffin, Ohio, recently by the Ohio Savings Bank & Trust Company, Toledo, acting as trustee for the bondholders. Several months ago the line was sold to the Toledo, Fostoria & Findlay Railway for $30,000 and that road is now operating the property. The latter company was made a party in this suit of bondholders.

Hearing Called on Abandonment Petition.—A hearing has been called at Buffalo, N. Y., before Public Service Commissioner Pooley on the petition of the Buffalo & Erie Railway for approval of abandonment of a portion of its route in Fredonia and the town of Pomfret, Chautauqua County.

Line Discontinued—The interurban operated between Albia and Hiteman by the Albia Light & Railway Company, Albia, Iowa, has discontinued service. The line was established in 1908. It has been operating at a loss for the last few years.

Files Abandonment Routes. — The Yonkers Railroad, Yonkers, N. Y., has filed a certificate in the office of the Secretary of State abandoning that portion of its route on Central Park Avenue, Walnut Street, McLean Avenue, Tuckahoe Road and Bronx River Road.

Southern Power & Light Sold.—Stockholders of the Southern Power & Light Company, meeting at Pine Bluff, Ark., on June 15, approved the merger of that company and its subsidiaries with the Electric Power & Light Corporation. The Southern Power & Light Company is the controlling corporation for the Couch-Longino properties in Arkansas, Louisiana and Mississippi. H. C. Couch continues as president of the Southern Power & Light and other companies in that group.

Will Abandon Service.—The Arkansas City-Winfield Northern Interurban Railway is to abandon its railway service between Arkansas City and Winfield, Kan., and in these cities. The line has been a losing proposition for some five years, despite efforts of the city to keep it going. The recent granting of a franchise to a bus company and the several truck and passenger lines operating between the towns have been instrumental in the company's failure.

May Abandon Valuation.—Valuation by the city of Winnipeg of the traction system of the Winnipeg Electric Company, Winnipeg, Man., may be abandoned as a way of keeping the proposed purchase out of the arbitration proceedings, should the ratepayers pass a by-law in favor of its acquisition. Following the arguments advanced by Alderman D. McLean, early in the proceedings with the company, that the city of Winnipeg had no course open but to accept for submission to the ratepayers the company's asking price for its tramway system if it wished to avoid arbitration the special committee now is considering cancellation of the analysis of valuation ordered three weeks ago.

Deficit for May in Toledo.—A deficit of $5,131 for May was reported by the Community Traction Company, Toledo. Operating expenses for May were $158,452, compared with $182,660 for a similar month a year ago. This cut was due to economies in operation. Passenger revenue was $286,904, compared with $297,482 last May. The deficit to the stabilizing fund is now $135,529 plus the original $400,000 in the fund. Car riding slumped compared with April. There were 131,027 revenue passengers per day on an average in May, 1925, compared with 138,348 in April and 148,708 in May last year. Total revenue passengers for the month were 4,061,842, compared with 4,609,937 in May, 1924.

May Receipts Show Gain.—The gross income of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for May was $394,729 in excess of the gross for May, 1924, under the four-tokens-for-a-quarter rate. The present temporary rate is 8 cents, two tokens for 15 cents. All lines carried 80,047,428 passengers in May, as against 81,288,979 pessengers in May, 1924. The report shows the surplus for the five months to be $518,232 and for the month of May $134,594. The total number of passengers carried in the five months was 385,949,131, of which surface, subway and "L" lines carried 384,743,150 and buses 1,205,981.

PROFIT AND LOSS

	1919	1920	1921	1922††	1923	1924
Gross earnings	$24,683,038	$28,986,228	$23,329,068	$13,184,771	$8,863,599	$8,360,035
Operating expenses	19,792,528	25,025,165	19,428,779	10,098,489	7,243,270	7,275,797
Net earnings	$4,890,510	$3,961,063	$3,900,289	$3,086,282	$1,620,328	$1,084,238
Other income	546,406	676,118	716,224	1,064,574	873,582	692,924
Gross income	$5,436,916	$4,637,181	$4,616,513	$4,150,856	$2,493,910	$1,777,163
Income from bonds	.....	.....	.....	.....	78,784	.....
	$5,436,916	$4,637,181	$4,616,513	$4,150,856	$2,572,694	$1,777,162
Interest and taxes	2,868,250	3,003,606	3,351,068	2,222,981	1,630,264	1,625,778
Dividends	1,200,000	1,200,000	675,000	230,275	921,351	460,750
Depreciation reserve	950,000	400,000	400,000	250,000	.....	.....
Surplus	*$418,665	*$33,575	*$190,445	*$1,447,600	$21,079	†$309,366
Rate per cent earned	10.79	8.21	3.68	10.09	5.6	.....

*After depreciation and taxes. †Deficit. ††City took over local Detroit lines May 15.

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Personal Items

H. S. Robertson, Manager

Executive Long Familiar with Denver Problems Appointed to Operating Post

When Edward A. West resigned as general superintendent of the Denver Tramway, Denver, Col., to join the Utah Light & Traction Company, Salt Lake City, there was much speculation on the outside as to who would be selected to assume the varied duties he had so ably performed. On the inside, however, was Howard S. Robertson, to whom the other members of the board said:

"Mr. Robertson, you are thoroughly familiar with the policies of the company and as our general manager you will please direct us." That's how the vacancy was filled. Mr. Robertson certainly was familiar with the company's affairs. For about twelve years he has been secretary of the company, a member of the board of directors, and while not taking an active part in operating details he knew what had been going on. Because of this and his untiring devotion to duty his advancement to the general managership followed.

H. S. Robertson

On entering the general manager's office the representative of the ELECTRIC RAILWAY JOURNAL at Denver met a man of medium build, with iron gray hair, who acted according to what is generally understood to be "Southern hospitality." His reply to the inquiry for Mr. Robertson, "Why, that's me," seemed to pop out with a "Glad to see you" back of it, showing that a pleasing personality and ability had carried Howard Robertson forward to the position he occupies.

This man who has worked so silently for so many years at Denver as to escape the attention of practically all but his friends and immediate associates was born in Cheyenne, Wyo., on May 23, 1878. When he was only three years of age the family moved to Denver and he has been there ever since. After finishing in the public schools, he was graduated from West Denver high school, and in due time walked from the University of Colorado's law school carrying his sheepskin. This was in 1901. He lost no time in having a gold lettered sign printed, but went right to work in the claim department of the Denver Tramway. Two years later he joined the legal department as an assistant to C. J. Hughes, Jr., the general counsel. In 1908 he was appointed general attorney, serving with Gerald Hughes, who had succeeded his father as general counsel.

If Mr. Robertson has an avocation it is hiking. He has never been known to neglect business to go on a hike; neither has he been known to neglect an opportunity to relax when a respite from business has been earned.

J. J. Doyle Heads Washington-Baltimore Interurban

George T. Bishop, president of the Washington, Baltimore & Annapolis Railroad, Washington, D. C., for the last twenty years, becomes chairman of the board of directors; J. J. Doyle, formerly vice-president and general manager, becomes president; George Weems Williams, first-vice-president and general counsel; Thomas P. Littlepage, second vice-president and secretary, and Harry T. Connolly, general manager.

The changes are due to the desire of Mr. Bishop to be relieved of the more active duties of that office.

The new president, Mr. Doyle, has resided at Baltimore for nearly twenty years and has been connected with the company in various capacities for that period. Mr. Connolly, the new general manager, was born and reared in Baltimore and was manager of utilities at Annapolis until his appointment as assistant general manager.

Ernest Stenger Heads New Denver Company

Ernest Stenger will head the successor to the Denver Tramway as president under the reorganization. Mr. Stenger has been receiver under Judge Lewis. He was elected president of the Denver Tramway in 1920, a short time before it went into the hands of the receiver. Prior to taking over that position, he was superintendent of the southern division of the Union Pacific Railroad, with headquarters at Kansas City.

Glasgow Appointments Made

The Glasgow tramways committee has approved of proposals by the manager to appoint various members of his staff to take charge, under his direction, of certain sections of the department. The new appointments are: J. MacDonald, engineering (electrical); A. Gerrard, engineering (mechanical); J. Grierson, engineering (civil), and G. B. Masterton, engineering (construction). These changes have been rendered necessary through the resignation of George G. Braid, chief engineer of the department.

W. S. Hart Heads Canadian Association

William Stephen Hart, elected president of the Canadian Electric Railway Association at the recent meeting in Montreal, is an officer or a director in nearly all the many enterprises in Canada with which the Aldred interests are identified. He is treasurer and director of the Shawinigan Water & Power Company, treasurer and director of the Canada Carbide Company, Ltd., vice-president and treasurer and director of the Canadian Electro Products Company, Ltd., vice-president and director of the Continental Heat & Light Company, president and director of the Electric Service Corporation, managing director, treasurer and director of the Highway Lighthouse Company, Ltd., vice-president and director of the North Shore Power Company, treasurer and director of the Quebec Power Company, treasurer and director of the Quebec Railway, Light, Heat & Power Company, Ltd., vice-president and director of the Shawinigan Engineering Company, Ltd., treasurer and director of the St. Maurice Power Company, Ltd., vice-president and director of both the Shawinigan Falls Terminal Railway and the Three Rivers Traction Company.

W. S. Hart

This is an imposing array of offices. Still the incumbent of them has so far escaped the public limelight. His very accession to these posts means that he has done many unusual things, but they have been done so unostentatiously that leads have been difficult to secure and impossible to follow. This much is known. Mr. Hart is another American who has become one of Canada's empire builders. He was born in Foxborough, Mass., on June 1, 1878 and was educated at the Massachusetts Institute of Technology. He went to Canada from the United States in 1903. In that year this man of many corporate interests commenced with the Shawinigan Water & Power Company as an accountant. He was appointed secretary in 1906, treasurer in 1912 and a director in 1916.

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Wisconsin Public Service Announces Change

J. C. Shade, who has been in charge of the railway department of the Wisconsin Public Service Corporation, Green Bay, Wis.; W. H. Sylvester, superintendent of railways, Manitowoc, and C. E. Borgnis, engineer maintenance of way, Green Bay, have tendered their resignations. George Biebel, superintendent of transportation, will look after the operation of the railway department at Green Bay; H. A. Zimdar, manager at Manitowoc, will take over Mr. Sylvester's duties, and Francis Daniell of the power department will look after the work heretofore in charge of Mr. Borgnis. All of these departments will operate under the general direction of Mr. Carson.

L. H. Breuer, Rolla, Mo., was recently reappointed chief counsel for the Missouri Public Service Commission by Gov. Samuel A. Baker.

J. Welling, permanent way engineer for the London County Council Tramways since 1901, is retiring. He will receive a pension of £504 a year.

H. McDavid, for the last seven years secretary and treasurer of the Hattiesburg Traction Company, Hattiesburg, Miss., recently purchased by the Mississippi Power Company, has been succeeded by E. E. Burkett, who has been general bookkeeper. Mr. McDavid will be superintendent of local operations in Gulfport, Miss., for the Mississippi Power Company.

Obituary

William Tichenor, claim agent of the Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., and president of the American Electric Railway Claims Association, 1914-1915, died at his home in Indianapolis on June 12. He was graduated from the University of Michigan and after the completion of his law studies he began the practice of law in Terre Haute. In 1905 he was made assistant attorney of the Indianapolis Traction & Terminal Company. After the merger which resulted in the formation of the Terre Haute, Indianapolis & Eastern Traction Company Mr. Tichenor was made claim agent of the company. This position he held up to the present time. He was very active in claims association work and before his election as president of that body was second vice-president and first vice-president.

F. Spencer, one of the pioneers of electric traction in England, died on May 16. He was an engineer in connection with the construction and operation of the Blackpool electric tramway, opened for traffic in 1885. After that Mr. Spencer held various tramway engineering and managing positions. One of his sons is C. J. Spencer, general manager of the Metropolitan Electric Tramways.

William Mainland, president of the Hannibal Railway & Electric Company, Hannibal, Mo., died on June 3 at his home in Oak Park, Ill. He was 66 years old.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Sixty Buses Ordered for Kansas City

Francis M. Wilson and Fred W. Fleming, receivers for the Kansas City Railways, Kansas City, Mo., have practically completed all arrangements for the purchase of the buses which are to form the auxiliary transportation system. The first order, for 25 single-deck, 29-passenger street-car type buses, was awarded to the Yellow Coach Manufacturing Company, Chicago, on the night of June 10.

The receivers are buying only the chassis for the several types of buses from the bus manufacturers. Two St. Louis car companies are to build the bodies, the chassis being delivered at St. Louis rather than to Kansas City.

On the afternoon of June 11 Mr. Wilson, in order to get guaranteed delivery within a certain period, called the executive offices of the Six-Wheel Safeway Manufacturing Company, Philadelphia, on the long-distance telephone and ordered eighteen double-deck buses and five parlor cars from that company. Agreement was obtained to have all the double-deck buses delivered at the body manufacturers in St. Louis within 42 days and the five parlor car chassis within 49 days. The point on which the purchase of the six-wheel buses had hung fire was that of early deliveries. The agreement for the purchase of the six-wheel buses having been made orally between Mr. Wilson and the Philadelphia manufacturer's executives, the receivers signed the formal order the same day. The bodies for these will also be built in St. Louis.

On June 12 it was announced that two of the six-wheel chassis had been shipped on that day from Philadelphia to the body makers at St. Louis, to be used in making measurements for eighteen double-deck bodies and the five parlor car bodies. It also became known on that day that the Yellow Coach Company intended to make immediate shipment of a sample chassis to St. Louis to enable the body makers to start on the street-car type bodies.

The receivers also have arranged to purchase from the Mack Truck Company two standard-type buses for use on the feeder lines. The Mack company is also to furnish eleven chassis to be shipped to the body makers in St. Louis, but the two standard buses will be the first of the new system to be seen on Kansas City's streets. They are expected to arrive in July in time to be placed in service in accordance with the provisions of the franchise granted the railway in connection with the auxiliary bus lines.

It was announced on June 13 that the receivers had decided to fit six buses with gasoline-electric equipment for use on the 39th Street route. The pur-

ELECTRIC RAILWAY MATERIAL PRICES—June 16, 1925

Metals—New York

Copper, electrolytic, cents per lb.	13 75
Lead, cents per lb.	8.35
Nickel, cents per lb.	34 00
Zinc, cents per lb.	7.30
Tin, Straits, cents per lb.	56.00
Aluminum, 98 to 99 per cent, cents per lb.	27.00
Babbitt metal, warehouse, cents per lb.:	
Fair grade	60.00
Commercial	28.00

Bituminous Coal

Smokeless mine run, f.o.b. vessel, Hampton Roads	$4.275
Somerset mine run, Boston	1.975
Pittsburgh mine run, Pittsburgh	1.95
Franklin, Ill., screenings, Chicago	2.125
Central, Ill., screenings, Chicago	1.775
Kansas screenings, Kansas City	2.625

Track Materials—Pittsburgh

Standard steel rails, gross ton	$43.00
Railroad spikes, drive, Pittsburgh base, cents per lb.	2 95
Tie plates (flat type), cents per lb.	2 375
Angle bars cents per lb.	2.75
Rail bolts and nuts, Pittsburgh base, cents, lb.	4.075
Steel bars, cents per lb.	2.00
Ties, white oak, Chicago, 6 in.x8 in.x8½ ft.	$1.50

Hardware—Pittsburgh

Wire nails, base per keg	2.7
Sheet iron (28 gage), cents per lb.	3.15
Sheet iron, galvanized (28 gage), cents per lb.	4.25
Galvanized barbed wire, cents per lb.	3 45
Galvanized wire, ordinary, cents per lb.	2.50

Waste—New York

Waste, wool, cents per lb.	16
Waste, cotton (100 lb. bale), cents per lb.:	
White	13–19
Colored	10–15

Paints, Putty and Glass—New York

Linseed oil (5 bbl. lots), per gal.	$1.07
White lead in oil (100 lb. keg), cents per lb.	0.1575
Turpentine (bbl. lots), per gal.	1.02
Car window glass, (single strength), first three brackets, A quality, discount*	84.0%
Car window glass, (single strength), first three brackets, B quality, discount*	86.0%
Car window glass, (double strength) all sizes, A quality, discount*	85.0%
Putty, 100 lb. tins, cents per lb.	4–6

* Prices f.o.b. works, boxing charges extra.

Wire—New York

Copper wire base, cents per lb.	15.50
Rubber-covered wire, No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, cents per lb.	18.00

Paving Materials

Paving stone, granite, 4x8x4, f.o.b. Chicago, dressed, per sq.yd.	...
Common, per sq.yd.	....
Wood block paving 3½, 16 lb. treatment, N. Y., per sq.yd.	$2.86
Paving brick 3½x8½x4, N. Y., per 1,000 in carload lots	51.00
Paving brick 3½x8½x3 N.Y., per 1000 in carload lots	45.00
Crushed stone, ¾-in., carload lots, N. Y., per cu.yd.	1.85
Cement, Chicago consumers' net prices, without bags	2.20
Gravel, ¾-in., cu.yd., f.o.b. N. Y.	1 75
Sand, cu.yd., N. Y.	1 00

Old Metals—New York and Chicago

Heavy copper, cents per lb.	11.125
Light copper, cents per lb.	9.375
Heavy brass, cents per lb.	7.00
Zinc, old scrap, cents per lb.	4 375
Lead, cents per lb. (heavy)	6.75
Steel car axles, Chicago, net ton	$17 25
Cast iron car wheels, Chicago, gross ton	18.00
Rails (short), Chicago, gross ton	18.75
Rails, (relaying), Chicago, gross ton	25 50
Machine turnings, Chicago, gross ton	9.25

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chase of this equipment is contingent upon terms of maintenance offered by the electric company. The gasoline-electric equipment was tested on June 12, and found to be satisfactory to the receivers.

To prevent confusion about fares, buses on the 25-cent parlor car line to the Country Club district will be painted a dark blue, with the company's monogram in gold.

Fares on all other lines are to be 10 cents, with transfer privilege between street car and bus for an extra 3 cents.

The first feeder line is expected to be in operation on July 4. The single-deck buses are to arrive in August and September and the double-deck buses in October.

E. M. Howe Heads Gray Motor, Maker of Tilling-Stevens Buses

Following a recent meeting of the directors of the Gray Motor Corporation, Detroit, Mich., announcement was made of the election of Ernest M. Howe, widely-known British transportation expert, as president of the Gray organization.

Coincident with the election of Mr. Howe as president, Henry W. Burritt was made vice-president and treasurer and B. M. Schultz secretary. The new Gray directorate will consist of Paul Gray, O. J. Mulford, Fred J. Robinson, Frank Beall, Henry W. Burritt, Ernest M. Howe, David M. Brown, Hobart B. Hoyt, Benjamin S. Hanchett, Charles P. Norcross and Henry Melville.

The manufacture and sale of Gray cars will be continued and expanded, and in addition the Gray Motor Corporation will be the sole manufacturer in the United States for the Tilling-Stevens Corporation, maker of the Tilling-Stevens gasoline-electric bus.

The gasoline-electric bus as it will be produced by the Gray organization will be an American vehicle throughout, save only for the electrical equipment. It will embody the Tilling-Stevens electric drive and control.

Car Purchase Necessitates Power Equipment

The demand for increased power due to the contemplated addition of 130 new multiple-unit cars by the Pittsburgh Railways, Pittsburgh, Pa., has made necessary the purchase and installation of new power equipment by the Duquesne Light Company. These cars will be put into service in the fall. A large part of this new power equipment will be used in the installation of the first automatic railway substation on the Duquesne Light system.

This automatic substation will be located in Mount Oliver and will include a 2,000-kw. converter, transformer and automatic switching.

It is proposed to extend the present switching station at Penn and Swissvale Avenues, Wilkinsburg, so that two 2,000-kw. 600-volt converters with transformers and manual switching may be installed at Wilkinsburg. They will supply 600-volt direct-current power to the Pittsburgh Railways. The power equipment is being furnished by the Westinghouse Electric & Manufacturing Company.

Rolling Stock

Rockford & Interurban Railway, Rockford, Ill., has ordered three 20-passenger buses.

Pine Bluff Company, Pine Bluff, Ark., has received two new street cars of the Birney one-man safety type, with two-motor control and a capacity of 34 passengers. The cars were made by the American Car Company of St. Louis.

New Incorporation

Quincy & Northeast Electric Railway, Quincy, Ill., recently filed papers of incorporation with the Recorder of Deeds at Quincy, Ill. The proposed line would run from Quincy to Monmouth, Ill., through Adams, Hancock, Henderson and Warren Counties. The articles of incorporation list the capital at $1,200,000 and authorize the use of steam, electricity or other motive power.

Track and Line

Illinois Traction System, Peoria, Ill., has acquired property in Madison, Ill., needed to eliminate a sharp curve in the tracks at Second and Madison Avenue, recently taken over from the Alton, Granite & St. Louis Traction Company. Two parcels of land purchased cost $54,000 while labor and material will bring the total expenditure for the improvement to $75,000.

Winnipeg Electric Company, Winnipeg, Man., recently completed the laying of 4,400 ft. of second track on St. Mary's Road, Winnipeg, from McMillan Street to St. Anne's Road. It is open-track construction.

Toronto Transportation Commission, Toronto, Canada, was authorized by a resolution of the York Township Council to construct and lay down railway tracks to complete the Rogers Road line to Bicknell Avenue, as outlined in the Toronto Transportation Commission report, which revises the estimate for the cost of this work from the tentative estimate last year of $350,000 to $329,000.

New York & Queens County Railway, New York, N. Y., has started the double-tracking of the line operating between Jamaica and Flushing. There is a total of 14,547 ft. of single track between Flushing and Jamaica. It is expected that half of this will be double tracked during the summer. The work, under the direction of Receiver Andrews, has been necessitated by a growth in population in this territory and by the anticipated growth in traffic when the subway between New York and Flushing is put into operation.

Portland Electric Power Company, Portland, Ore., is to expend $17,000 extra in trackage in order to extend its lines on the new St. John's section over a route that will be more nearly in the interests of safety. F. I. Fuller, vice-president, stated to the City Council that the company would be willing to do this if it was relieved of the cost of paving between and alongside its new tracks.

Intercity Terminal Railway, North Little Rock, Ark., has completed the 1-mile extension over East Second St.

British Columbia Electric Railway, Vancouver, B. C., will soon install additional track facilities on the Sasamat line, together with electric signals for single-track operation. Plans are being prepared for double-tracking 41st Avenue from Granville to East Boulevard and will be submitted soon to the Point Grey authorities for approval.

Trade Notes

Continuous Transit Company, New York, N. Y., at a recent directors' meeting decided that the New York office should be discontinued some time during the last week in June. All future communications with reference to the moving platform should be addressed in care of Thomas Drever, president of the Wahl Company, 1800 Roscoe Street, Chicago.

Timken Roller Bearing Company, Canton, Ohio, announces the retirement of Heman Ely, vice-president and treasurer. Mr. Ely became associated with the Timken company in 1909 as secretary and in 1916 was also appointed treasurer. He became vice-president and treasurer in 1920. H. J. Porter, who has been general sales manager, is advanced to vice-president in charge of sales. L. M. Klinedinst, heretofore assistant to Mr. Porter, becomes general sales manager of the industrial division.

Charles N. Ring, until recently works manager of the Allied Steel Castings Company, Harvey, Ill., has been appointed assistant director of the Electric Steel Founders' Research Group, succeeding W. J. Corbett, who has resigned to become secretary-manager of the Steel Founders' Society of America.

Gold Car Heating & Lighting Company, Brooklyn, N. Y., recently had a convention of its sales representatives, gathered from all parts of the United States. At the conclusion of the conference F. O. Bailey, sales manager, gave a luncheon at the Whitehall Club, at which were present E. E. Gold, president, and E. B. Wilson, vice-president, and the sales force. Subsequently the representatives and their wives were entertained at Coney Island by Mr. Bailey.

Timken-Detroit Axle Company, Detroit, Mich., has announced that P. W. Sloan, who has been service engineer in charge of the field service men, has been appointed service manager. Mr. Sloan has been connected with the Timken organization for a number of years.

New Advertising Literature

Steel Sales Corporation, Chicago, Ill., has issued "The Welder's Guide," a 44-page reference work "for the man who is actually welding."

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 335 on steel bars.

Herman H. Sticht & Company, New York, N. Y., have issued a bulletin, No. 130, describing two types of the Model "D" Standco megohms.

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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

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JUN 29 1925

Obsolete Equipment Affects Public Opinion

IN A PAPER before the annual summer meeting of the Central Electric Railway Association at French Lick, Ind., Charles Gordon, Western editor ELECTRIC RAILWAY JOURNAL, suggested that the element of style should be given serious consideration in judging the ride-merchandising value of street car designs.

This opens a progressive line of thought. If stylish, rakish and attractive looking cars create an instinctive desire to ride, then it follows that aged, old-fashioned looking equipment tends to limit riding to those who are forced to use the cars by lack of other facilities.

But obsolete equipment does even more harm than that. It creates a popular impression that the very industry itself is obsolete. It causes people to believe that the development of car design for rail operation is at a standstill. It leads them readily to accept the idea that transportation by rail in city streets is itself an obsolete mode of travel.

This impression is further stimulated by contrast with the automotive vehicle—both private cars and buses. People have seen the automotive vehicle radically improved in a very few years. They have come to have confidence in the ability and progressiveness of automotive designers and manufacturers. They tend, therefore, to accept readily the opinions advanced by the occasional enthusiast who predicts the doom of the rail-borne electric car.

To overcome this easily spread idea, they must be given more information about the place of the street and interurban car in the modern scheme of transportation. Publicity is essential in accomplishing this. But no amount of publicity can overcome the unpopularity created by awkward, cumbersome, heavy and noisy cars in the streets. To overcome the impression that the electric railway is a back number it is essential that every effort be expended toward the retirement of obsolete looking equipment.

Every Man a Salesman for the Service

COMPLETE as it was, the brief of the Northrn Texas Traction Company, Fort Worth, Tex., that won for it the Coffin prize did not exhaust the subject of selling service so far as that company was concerned. This was strikingly instanced at a recent weekly staff meeting attended by one of the editors of this paper. The proccedings were particularly interesting because the program consisted largely of subjects which had been laid out at a previous meeting, before any one even knew that a visitor was to be in town and attend.

The session lasted about three hours. Every subject discussed had something to do with the sale of rides. Running through a number of subjects, from car painting to the posting of car stop signs, every item taken up at that meeting was discussed from the angle of building more car rides.

In connection with one particular merchandising campaign which was in preparation, a number of suitable, attractive slogans were desired. Every man at that meeting was called on to read a list of slogans which he had prepared. These lists included many good slogans; some were not so good. All of them were frankly criticised, and many suggestions were developed from the criticism.

Entirely aside from the question of the availability of the slogans, every man in that meeting was thinking about the sale of transportation. Unquestionably, each man took back with him to his own department a keener realization that transportation is a service which can and must be merchandised and that the work of every department, from mechanical to claims, should be carried on with the one common object of selling more car rides.

The name of the property has been mentioned in this discussion not with a desire to pat the officials on the back. They don't need it. The meeting described does, however, illustrate one of the ways in which the coveted Coffin honor was won by this comparatively small property way down in Texas. Other traffic sales methods used by the company are described elsewhere in this issue. In exact proportion to the degree in which this need for merchandising the service is being recognized and turned to advantage may the electric railway of today expect to succeed in converting automobilists and pedestrians into car riders.

Receivers Race to Forestall Default

QUICK work has been done in devising the plan for the readjustment of the finances of the Detroit United Railway. There was need for quick work. The sum of $250,000 is required by July 1 to avoid default in the sinking fund payment. The plan now put forward, if approved, will meet this demand. In financial parlance it is a readjustment, not a financial reorganization, that is proposed. Foreclosure and reorganization will follow only if the plan now presented to the stockholders and the creditors is not approved by them, but this appears unlikely. So far there has been no default in the payment of interest or in meeting the sinking fund requirements. The race by the receivers is to forestall such contingency.

It is up to the stockholders. They are being asked to put in an additional $6,150,000. The assessment they are called upon to meet by July 1 is 40 per cent. For the new money they will get new general mortgage bonds which will become a first lien in 1929. Creditors are being asked to accept the same security. Their choice is between subscribing to the plan and trying to protect themselves if the property of the company

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should have to be disposed of at forced sale. Of the many noteworthy aspects of the new plan, the one calling for a change in the conditions surrounding the stock deserves attention. There is only one issue now—all common. Preferred stock and two classes of common stock are proposed. Ultimately, one of these issues of common stock may prove to be quite valuable. The very slim equity behind it at the inception of the plan ranks it as highly speculative, but if the plan works out financially as the operating managers anticipate that very slim equity may result in its eventually becoming very valuable.

The plan was published in the ELECTRIC RAILWAY JOURNAL for June 20 in detail sufficient to permit it to be interpreted intelligently. The engineers for the property estimate a balance available for the coming year of $697,288, presaged on the adoption of the plan and the assumption that an increase in rates will be permitted. This permission is now being sought. Rates are inordinately low. Competition, now partly overcome, appeared to dictate a rate policy which has turned out to be a tactical error.

So far as the plans ahead for the property have been divulged they contemplate no radical change from the program laid down previous to the receivership. Contingent upon the approval of the plan at the meeting on June 29 the program will be carried forward rigorously to fulfillment. If the conditions that beset the Detroit United were peculiar to that property the need would not exist for extended comment, but such is not the case. For this reason the readjustment plan, contemplating as it does a raise in rates, greater use of the bus, further articulation of railway and bus and more intensive cultivation of business, are of more than academic interest. Fundamentally the program is sound. Time alone will write the final appraisal on the sagacity displayed in carrying out the moves that are contemplated.

"Excelsior" Is a Poor Watchword for the Architect

PITTSBURGH is conducting an enthusiastic drive to secure funds for the erection of a "cathedral of learning." No one will deny that an increase in its educational facilities is likely to be advantageous to that or any other city. One feature of the proposed plan, however, may well arouse grave misgivings. To raise the edifice housing this university high above all other structures round about—and there are already many tall buildings in Pittsburgh—would be a serious mistake from several points of view.

Whether the skyscraper is a type of architecture that will produce a convenient and suitable home for an institution of learning is a question that may well be left to the educators. The apparent indorsement of the many-storied building by its selection for this use, however, might have far-reaching effects of a most unfortunate kind. This phase of the matter is one that concerns every one interested in orderly, well-planned civic development, in which class nearly all transportation men will be found.

Outside of such large cities as New York, Chicago and Philadelphia even the transportation men themselves, perhaps, do not fully realize the evils of the skyscraper. Concentration of enormous numbers of people on a small ground area presents a transit problem that is beyond the possibility of efficient and economical solution with the facilities now available.

Many other valid objections can be raised against the extremely tall building, but the congestion thereby created is alone enough to condemn it. Few dissenting voices will be heard among those people in the larger cities who suffer daily from this cause. Yet the small towns continue to yearn for taller and taller buildings. It is to be hoped that Pittsburgh will not add impetus to this worship of false gods by building a cathedral of learning in the shape of a towering skyscraper.

Trunk Lines Embark in Operation of Buses

BUSES are to be operated by the New York, New Haven & Hartford Railroad within the territory served by its lines. For this purpose a subsidiary with a capital of $1,000,000 has been organized. The step is significant. In this respect the New Haven is aligning itself with the Boston & Maine Railroad with similar plans for bus development in northern New England. Other railroads, including the Great Northern and the Chicago, Milwaukee & St. Paul Railroad, have also recently announced plans for operating buses.

Some such bus policy is inevitable on the part of the large steam railroads. The same reasons apply that compelled electric railways to install bus lines in city and interurban service. It is obvious that, by and large, the existing transportation system can furnish much more satisfactory service than can the independent, particularly in substantially parallel service. Two dissimilar lines under the same management permit one to be used as a complement to the other to reduce duplication of service. Particularly significant was the confession by the New Haven Railroad in its official statement of the character of some of the circuitous runs now necessary by train. Here especially does the railroad contemplate the use of the bus. This is wise.

So long as the states continue to spend vast sums on the construction and maintenance of improved highways, which can be used by the motor common carrier at little or no greater cost than by the private user, the number of bus and motor carriers is bound to increase. This does not mean that the automobile is a more comfortable or efficient means of transportation than is the steam-drawn train. But it does mean that for certain classes of service—as with sparse traffic—it can be operated successfully and perhaps can be used in other lines also to advantage.

The danger is always inherent of overestimating the earning and strategic value of new forms of transportation. If the steam railroads do not, in connection with bus operation, repeat mistakes of the past, they will benefit, as will also the territories which they serve. They should "make haste slowly" and go forward intelligently. Entirely aside from the many injustices in the present situation—and there are grave regulatory and other injustices—that work a temporary advantage in favor of the bus, the doom of the rural train made up of one locomotive, one baggage car and one combination smoker and passenger coach, all of the vintage of 1895 operated once a day in either direction, was sounded a long while ago. The wonder is that the steam railroads were so long in discovering it.

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Car Riding Increased 28 per Cent

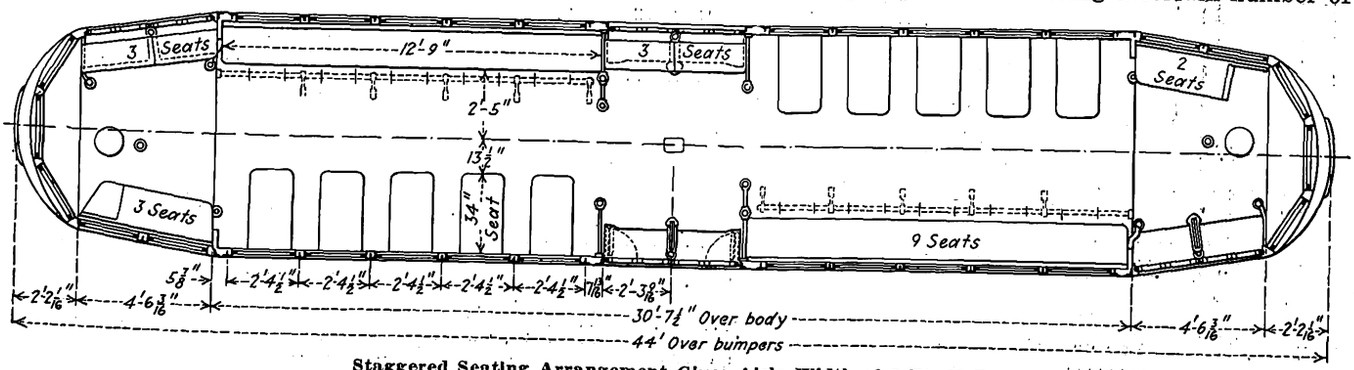
New Brooklyn Cars Increase Schedule Speed Due to Better Acceleration and Retardation and Decreased Loading Time — Lesser Weight and Better Schedules Reduce Energy Consumption—Other Features Are Incorporated in Last Cars Delivered

SERVICE requirements and operating conditions in Brooklyn are changing continually. The opening up of a new subway line or the extension of express service on one of the rapid transit lines affects travel on the various surface lines. This is shown sometimes by shifting of travel from one line to another, sometimes by a decrease and sometimes by an increase in the riding. It also affects the load in regard to the direction that people travel. An analysis of operating economies and changes which can be definitely attributed to the new cars of the Brooklyn City Railroad is therefore quite difficult, but by making an analysis on lines which are least affected by other conditions many economies are found to have resulted from the use of the new cars. These include increases in scheduled speeds, decreases in length of stops, and increased riding on the lines immediately after the introduction of this particular type of car. The last order for 335 cars was placed in November, 1924. Of these, 150 were built by the J. G. Brill Company, 100 by the St. Louis Car Company and 85 by the Osgood-Bradley Car Company. These cars, together with the 200 cars purchased in 1923, make a total of 535 double-end and pay-as-you-pass cars of this type ordered for Brooklyn service. Cars purchased on the first orders were described in ELECTRIC RAILWAY JOURNAL for Oct. 27, 1923, page 739. The last orders are for cars of the same general exterior appearance, and of essentially the same construction. However, there are a number of changes which are of particular interest, such as staggered seating, replaceable vestibules, power cables inside car, and rearranged barriers for controlling passenger movement. These have been found necessary by close study of the operation of the first cars.

Entrance at the Front and Exit at Center Separate Flow of Traffic and Reduce Time Consumed in Stops

Previous to the ordering of the first cars, an extended survey was made to determine factors which would influence the type of car to be bought. The large variation in the number of passengers carried during rush periods as compared with non-rush periods and also the variation on different lines of the system showed that it was advisable to have a car which could be arranged for either one-man or two-man operation. The pay-as-you-pass car, with entrance at the front and exit at the center, was decided upon as a result of a survey made to determine where people stood on the sidewalks at corners while waiting for a car. This showed that at most intersecting streets, at which there are near-side stops, passengers will wait at a point in line with the building line of the street, and a check of various types of cars in service showed that many people were walking the full length of a car after it had stopped in order to board it.

The theory that this type of car used in connection with near-side stops in Brooklyn would reduce the length of stop required for loading a certain number of



Staggered Seating Arrangement Gives Aisle Width of 3 Ft. 6½ In.

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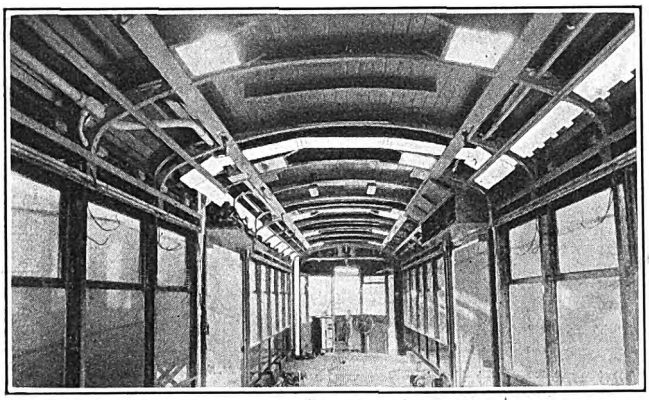
passengers has been borne out by surveys made on lines immediately after the new cars were placed in service. On the Flatbush Avenue line, the average duration of stop was decreased from eight seconds to 6.2 seconds through the use of the new cars. Comparison was made for the month of December previous to the introduction of the new cars into service with the December following the use of the cars. This showed that the schedule speed on the Flatbush Avenue line increased from 9.25 m.p.h. to 9.9 m.p.h. At the same time, the number of stops per mile made by the cars has increased from 8 to 10. This increased operating scheduled speed has resulted from several other factors which are features of the new car design. The average acceleration of the new cars is 1.7 m.p.h.p.s. as compared with 1.5 m.p.h.p.s. for cars previously used. The average rate of retardation under all conditions of loading was increased from 1.52 to 1.73 m.p.h.p.s. This increased braking rate is made possible through use of the



Main Power Circuits Are Installed in Metal Ducts Inside

empty and load brake on these cars. This provides for automatic adjustment of the braking pressure in proportion to the load carried by the car so that a uniform braking rate is obtained regardless of the load. On cars without this device braking pressure is set at the maximum which will not cause slipping of the wheels with an empty car and the rate of retardation decreases as the passenger load increases. The average braking rate for a loaded car is thus reduced over what is obtained with automatic adjustment.

Running Time Reduced Four to Seven Minutes

The beneficial effect of increased acceleration and retardation and decreased length of stop has resulted in a reduction in running time of from four to seven minutes on lines which have been equipped with the new cars. These lines vary in length from 6 to 8 miles. The number of passengers has increased rapidly with the use of new cars. Shorter headways have been necessary in some cases to care for the additional business, so that the reduction in running time has not permitted the removal of cars from service. The layover at the end of the line also has not been changed. The standard practice in Brooklyn is to provide a layover equal to the headway if this is less than four minutes, the maximum layover allowed.

The operating features of the cars just referred to together with the reduction in weight have also produced economies in energy consumption. These cars, averaging 21 tons each, give a reduction in weight of about 5 tons per car over previous equipment. Since service was started with new cars on the Gates Avenue line, there has been a reduction of four minutes in the power-on period per hour or from 23.2 minutes to 19.2 minutes. This has resulted in a reduction of 6.73 per cent in the power-on period for all cars on the line. Cars in Brooklyn are equipped with Arthur power saving recorders, so that accurate comparison of whole power-on periods can be made. The energy consumption for the new type of cars on representative lines is approximately 3.1 kw.-hr. per car-mile.

Large Increase in Riding

The increase in car riding is shown by comparison of the passengers carried on the Flatbush Avenue line and on the Richmond Hill line for December previous to the use of the cars with the month of December after the cars were placed in service. The Flatbush Avenue line was entirely equipped with the new type of cars and 80 per cent of the service on the Richmond Hill line was given with the new equipment. These particular lines are taken for comparison as the passengers carried were not influenced by other varying conditions to the extent that occurs on some lines. The Flatbush Avenue line shows an increase of 401,965 passengers and the Richmond Hill line an increase of 221,825 passengers. The combined increase for these two lines is 28.2 per cent.

Of course, it is to be expected that maintenance costs will be decreased while the cars are new, but certain other economies in maintenance cost will result through the reduction in the number of trucks and motors required for this type of car over types previously used. Thus, considering a comparison on a seat basis, the 334 cars purchased on the last orders will replace 371 cars of older type. The same number of seats will thus be provided with 37 less cars, and there will be 74 less trucks and 148 less motors to maintain. The number of extra cars needed at the present time to take care of cars withheld from service for repairs, cleaning, etc., is about 4 per cent of the total. General overhauling

DIMENSIONS, WEIGHTS AND EQUIPMENT OF NEW BROOKLYN CARS

Number of cars ordered	335	
Date order was placed	November, 1924	
Date of delivery	June, 1925	
Builder of car body	The J. G. Brill Co., St. Louis Car Co. and Osgood Bradley Car Co.	
Type of car	Closed motor, one-man, two-man	
Seating capacity	50	
Weight, total	42,000 lb.	
Bolster centers, length	21 ft. 6 in.	
Length over all	44 ft. 0 in.	
Truck wheelbase	5 ft. 4 in.	
Width over all	8 ft. 4 in.	
Height, rail to trolley base	10 ft., 9⅛ in.	
Body	Steel	
Interior trim	Cherry, stained magogany	
Headlining	Agasote and Nevasplit	
Roof	Arch	
Air brakes	Safety Car Devices Co. with variable load brake	
Anti-climbers	Hedley	
Axles	Carnegie heat treated steel	
Car buzzer system	Faraday	
Car trimmings	Statuary bronze	
Center and side bearings	Oil retaining type center bearings; special plain side bearings	
Conduits and junction boxes	Pressed steel duct with aluminum junction boxes	
Control	General Electric K-72A	
Curtain fixtures	Acme and National	
Curtain material	DuPont Fabrikoid	
Destination signs	Hunter	
Door operating mechanism	Consolidated and National Pneumatic	
Enamel	Devoe & Raynolds	
Energy saving device	Arthur	
Fare boxes	Johnson, type J	
Fenders or wheelguards	Root automatic	
Gears and pinions	Nuttall BP	
Hand brakes	Peacock staffless	
Heater equipment	Gold Car Heating Co.	
Headlights	Ohio Brass, Brooklyn type ZP	
Journal boxes	Brill and St. Louis	
Lightning arresters	Type MP	
Motors	Four Westinghouse 510-A, inside hung	
Registers	International	
Sanders	Ohio Brass	
Sash fixtures	Dayton Manufacturing Co.	
Seats	Cherry, slat type	
Slack adjuster	Westinghouse, type J	
Step treads	Feralun	
Trolley catchers	Ohio Brass, self-oiling	
Trolley base	Ohio Brass Form 1	
Trolley wheels	Columbia	
Trucks	Brill and St. Louis	
Ventilators	Railway Utility	
Wheels	Standard Steel, 26 in. diameter	

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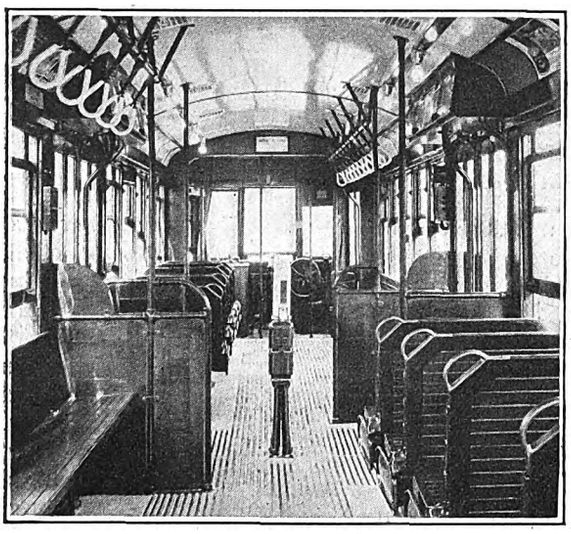
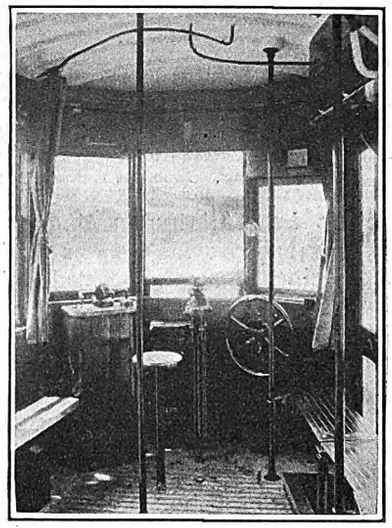
of the first cars purchased will start this fall, and at that time the spares will have to be increased to approximately 10 per cent. But even with this, the number of extra equipments required will be reduced from approximately 20 per cent to 10 per cent.

Another saving has resulted from the use of Johnson type J coin boxes, together with solenoid-operated registers. The fare collection and registering equipment was described in ELECTRIC RAILWAY JOURNAL for Oct. 27, 1923, page 747. The increase in passenger receipts with the new type of coin switch over that when using the older type of fare box was found to be approximately 4 per cent. In speaking of the reason for this saving, C. E. Morgan, vice-president and general manager of the railroad, said that he believes it is due largely to the increased opportunity given conductors to inspect individual coins in the fare box. With this type of equipment, the passenger places the coin in a slot and after it is registered it is exposed to the view of the conductor. Since each individual fare is deposited and is brought to view separately, the operator has a better chance to detect fraudulent practices than would be the case with several coins in a heap in the fare box.





At Left—Each Individual Fare Is Deposited and Brought to View Separately. In Center—The Inside Gives a Pleasing, Roomy Impression. At Right—Rear-End Seating Arrangement Provides a Comfortable Nook

The new cars are being painted with the same type of spider-web design on the dashers to distinguish the new cars from the old equipment that was used on the previous lot. Comments received from the public regarding this feature show that it has been of material assistance in advertising that new cars were being placed in service, and that these cars have increased advantages and riding comfort over the older equipment.

MINOR CHANGES IN THE NEW CARS

The width of the cars now being delivered has been increased 1 in. over the previous ones. Other dimensions are the same. Particular attention has been given to provide the maximum space possible in the cars. Due to operating clearances, cars in Brooklyn are necessarily limited in width. The new cars, with a width of 8 ft. 4 in., however, are but ½ in. narrower between the glass of the windows than the 5100 series of cars operated by this company, which are 2 in. wider over all. In order to move the window sash out as far as possible, a special construction is used for the side body posts. These consist of 1½-in. x 1½-in. x ⅜-in. rolled tees which extend from side sill angles to the top rail. A wood filler is placed on the inside of the tee and a formed sheet steel strip on the outside is bent down along the sides of the wood filler, to which it is bolted. The sash fits against these metal strips, which are welded to the window sill in order to keep out water.

Operation of the first order of cars showed that a wider aisle and additional space for standing passengers was very desirable. To provide for these, the last orders of cars have a staggered seating, with cross seats on one side of the car and a longitudinal seat opposite. This gives an aisle width of 3 ft. 6½ in. The seating capacity of 50 passengers remains the same. The arrangement of folding seats for the vestibules and at center doors of cars is the same. The Davis book type of folding seat has proved very satisfactory. It provides a seat length of 4 ft. 7 in. with both end and center supports and does away with the disagreeable feature of having a stanchion in the center of the seat which would limit the number of passengers which could occupy the space. This type of seat also prevents the danger and annoyance from folding supports being placed improperly which might result in the seat falling down while in service.

Some changes have been made in the arrangement of the stanchions and barriers at the center of the car. With the pay-as-you-pass system of fare collection, passengers going from the front or unpaid to the rear or pay section will ordinarily pass to the right of the conductor, while those in the front section who desire to alight will pass to the left. In the original design as installed on the cars, there were four upright stanchions extending from the floor to the roof in line with the aisle side of the cross seats. On the new cars these stanchions have been moved back approximately 10 in. toward the side of the car. The barrier on the left as a passenger goes from the front section to the exit extends out from the vertical stanchion and has a pipe railing at the top. By this arrangement, it is necessary for passengers to pass adjacent to the conductor. At the same time additional room is provided above the passengers' waists. This gives additional space for their elbows and arms, and also improves the inside appearance of the car since there is less obstruction to vision from one end to the other. All pipe

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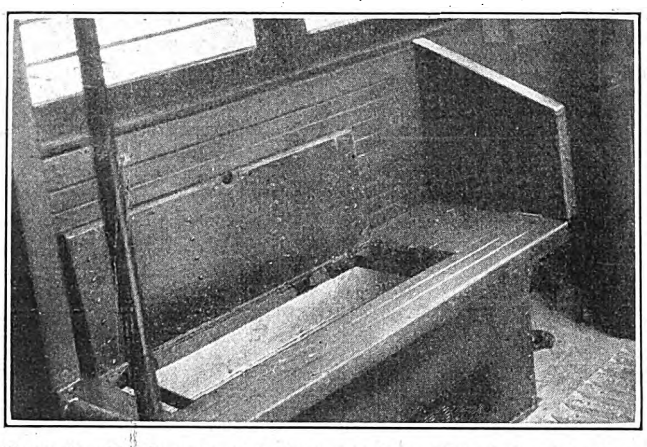
stanchions and railings are of 1-in. wrought-iron pipe. All flanges for stanchions are recessed so that they are flush with the floor. Stanchions are painted green with two coats of Lucas stanchion enamel covered with hard drying varnish. The floor mat at the center of the car also has had additional crosswise grooves added so as to facilitate drainage to the sides.

The window guards consist of six horizontal rods held by supports at each window post. These set into



There Are No Corners or Ledges for Collection of Sand in Sand Box Opening. Electric Heater in Seat Keeps Sand Dry

sockets in retaining castings. In order to prevent rattling and provide a tight fit, the center part of the supporting frame is beveled outward slightly, and a beveled casting on the window post fits tightly against this. Downward movement of the guards forces these two beveled surfaces together and prevents all looseness. The window guards are arranged in five sections for each side, two sections covering three windows each and three sections covering two windows each. They are hinged at the bottom and are arranged so as to drop down for cleaning the windows.

Vestibule Ends Are Demountable

A new feature of these cars is the construction of the ends of the vestibules ahead of the doors as separate units. This is to provide for easy removal and replacement in case of damage from collision in street traffic. Each vestibule has a double hood plate with the lower or sub-hood plate extending between the vestibule corner posts. This is securely bolted to the upper or main

Cabinets Are Provided for Auxiliary Circuit Switches and Fuses and for Door Engines

hood plate with the bolts readily accessible. The vestibule corner posts are made of wood in two pieces, bolted together. The forward part of each corner post and the two center vestibule posts are tenoned into the sub-hood plate only, while the rear parts of the corner posts are tenoned into the main hood plate only. Pocket castings bolted to the crownpiece are provided for the bottoms of all vestibule posts. The entire vestibule front is a separate unit made interchangeable for all cars of the series. Separate units can thus be kept on hand for replacement. The front section of the vestibule can be removed and a new one put in place in less than three hours. To dismount a vestibule, the equipment at the dasher must be disconnected. This includes the controller, brake valve, hand brake, etc. On the outside the dasher sheets and bumper shields must be removed. Removable sheets on the inside give access to the various bolts for disconnecting. In its normal position, the demountable section is supported on spacing blocks. After the bolts are disconnected, these spacing blocks are taken out, allowing the vestibule to drop down ¾ in. This gives clearance so that the section can then be swung outward and removed.

A fireproof compartment constructed of No. 18 gage sheet steel suitably lined with transite is provided at the No. 1 end for the switches and fuses controlling auxiliary circuits. The covers for the compartment are hinged at the top and latched at the bottom with Howard swing sash latches. Openings in the compartment provide for various wiring conduits. All switches are of quick-break blade type and these, together with the fuses, are mounted on a slate base. On the side opposite the switchboard cabinet, and over the entrance doors, is another cabinet for the door engine.

Time Saved by Tables of Destination Signs

Another feature of these cars is a table of numbered destination sign readings for convenience of the operator in turning the Hunter destination sign from one reading to another. The wording of each sign, together with a serial number, is stenciled on the back, so that these can be read conveniently by the operator when he lifts the cover. A table of the sign readings arranged alphabetically with the corresponding sign numbers is placed on glass by the decalcomania process. This table is placed in a metal holder at the back of the sign box. In order to shift a sign from one designation to another, the operator finds the number for the sign designation to which he wishes to turn the sign, then by lifting the cover and observing the number of the sign designation in place, he will know which way to turn the sign and how far in order to reach the required designation. This arrangement saves time and trouble of operators at terminals and is of particular value at points where there is no layover to allow time for it.

A change has also been made in the method of running the car cables and installing car wiring on the latest cars. The main train line cable between controllers on the first cars was installed in a 2-in. conduit running the entire length of the car body. On the new cars a junction box is installed underneath each controller. From this two 2-in. conduits run to the end sill, which is of open construction and serves as a junction box. The junction boxes underneath the controllers have covers at the bottom and front end, and the end sill has a cover for the bottom and the side toward the car body. This permits a straight pull of the cable from the junction box to the end sill and with the arrangement of covers there is ample space for pulling in wires. From the end sill motor cables are run in two 1¼-in. conduits. The wires between controllers and for the resistance leads cross over to the corner of the car through the end sill, go up the corner posts and back of the advertising sign racks to the center doors of the car, where they cross above the headlining. All this wire is run in metal duct. Aluminum junction

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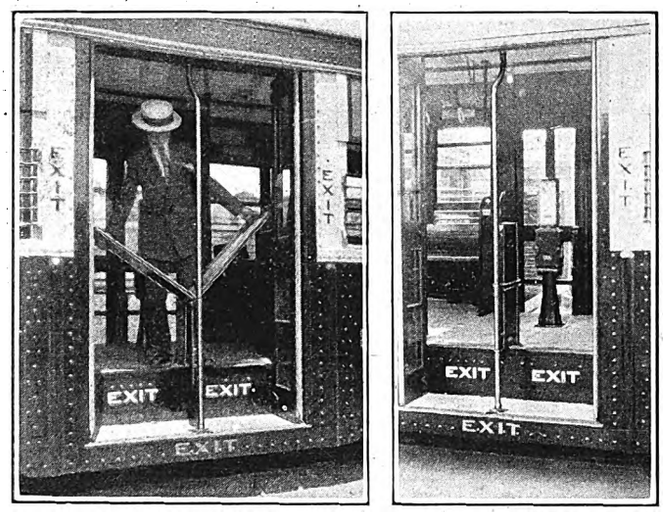
boxes are installed at each corner. Two junction boxes are installed at the center, one for the resistor lead splices and one for the main cable leads. The resistor cables are made up at the bench and are installed complete. All junction boxes are of aluminum to reduce weight. By installing the main car cable inside the car, additional space is given underneath for a better arrangement of the equipment installed underneath the car body.

In the new cars the number of sand boxes was reduced



At Left—Placing a Folding Book Type Seat in Position for Passengers. At Right—The Folding Seat Forms a Barrier to Divide Streams of Passengers Coming from Opposite Ends of Car

from four to two and these are installed underneath the longitudinal seat in each vestibule instead of underneath longitudinal seats at each corner of the car body. The boxes are lined with No. 22 gage galvanized iron and the top has a removable screen. Particular attention has been given in the design of the opening underneath the seat so that there are no projecting edges on which sand might lodge, so as to prevent closing down of the seat and loosening of hinges. The seat which forms a cover for the box is supported on two cross irons which have sharp edges and there are no supports at the ends or corners. A 1¼-in. steel discharge pipe which runs to a position 6 in from the rail is provided for each sand box. Particular attention is given to sealing the connection from the sand box to the pipe, so that water cannot enter. An electric heater under the seat with the sand box keeps the sand dry and prevents freezing in winter weather.

A change has been made in the method of attaching the coin box to the fare box stand. With this system of fare collection, the conductor changes his location from one side in the middle of the car to the other when the motorman changes ends. This requires the turning of the coin box 180 deg. Originally, it was necessary to unlock the box in order to turn it. With the new construction the contacts are made automatically so that the box can be rotated. If it is removed, the contacts are forced out of position, which disconnects them from the circuit. Other changes in the new cars include the use of a 14-in. gong, which gives a louder and clearer tone; installation of the heat regulator underneath one of the longitudinal seats instead of overhead on the platform, use of a heavier casting for the emergency drawbar and reinforcing castings where the vestibules join the car body.

The detailed specifications of the new cars are given in the table on page 1004.

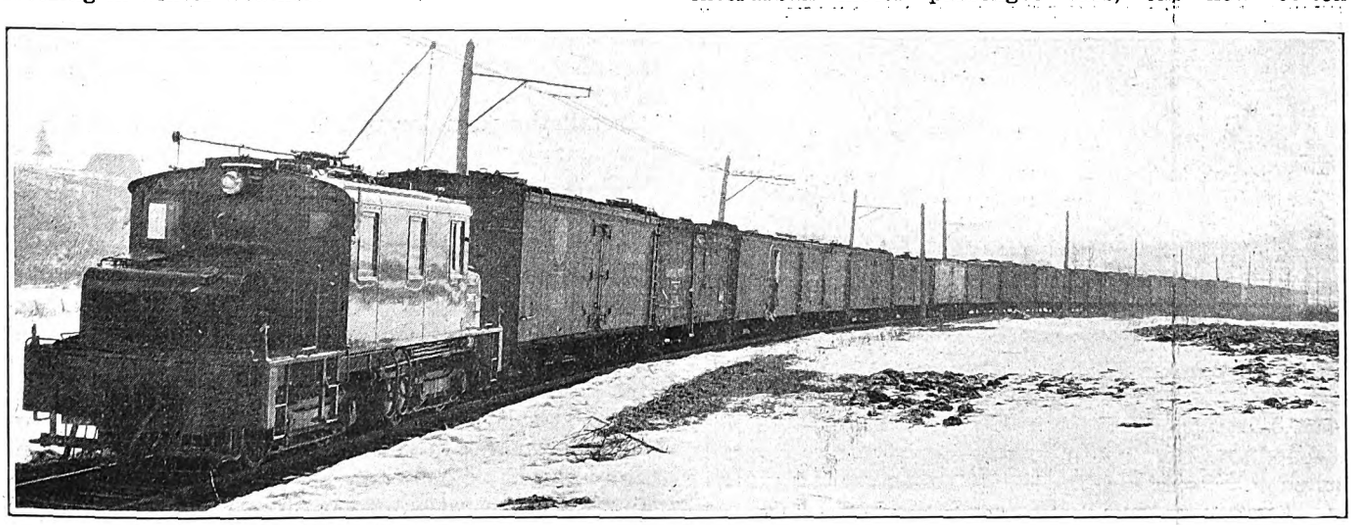
Handling Freight on Aroostook Valley Line

New 60-Ton Electric Locomotive Recently Built for This Service Has Interesting Features—Severe Winter Weather Presents an Operating Problem

DURING the year 1923-24 the Aroostook Valley Railroad, Presque Isle, Me., handled 3,746 cars of potatoes, averaging 675 bushels per car. Thus, at 20 lb. per bushel, the average car weight was 20¼ tons. At the same time 900 cars of inbound freight were received and distributed, most of which was fertilizer. The management considers that the road hauls one carload of fertilizer to every ten cars of potatoes. The railroad also handles a considerable amount of other freight, consisting of coal and general merchandise.

Weather conditions during the larger part of the year are very severe in this part of Maine. There is much snow and temperatures ranging between 25 and 35 deg. below zero are not exceptional. In spite of this weather handicap, the railroad maintains excellent service in handling its freight traffic.

Electrified lines of this railroad total about 32 miles. The rolling stock consists of one 40-ton locomotive, one heavy double-truck motor freight car, four double-truck interurban motor passenger cars, one new 60-ton



New 60-Ton Locomotive of the Aroostook Valley Railroad Hauling 30-Car Freight Train

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Baldwin-Westinghouse freight locomotive and a number of trail cars, both passenger and freight.

Several interesting features are included in the new locomotive. A central compartment houses the electrical equipment, except the compressors and blowers, which are mounted near the sloping hoods at each end of the cab. Air brake equipment is of the standard 14-EL type, particularly adapted for operating in multiple with standard steam railway equipment. The compressors are of the D-4-P, of 50 cu.ft. capacity.

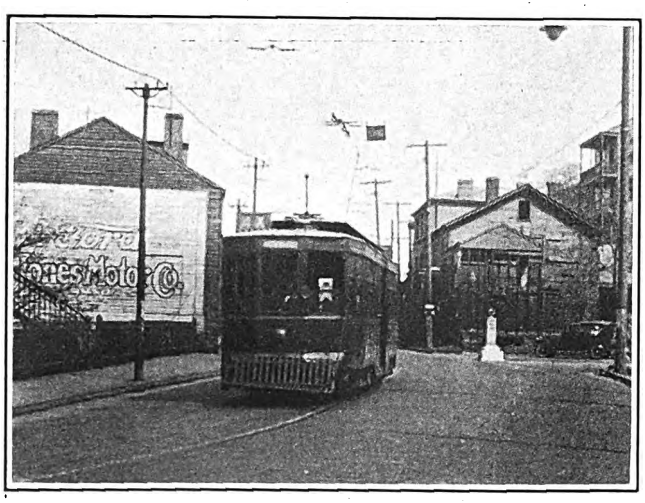
Motors are wound for 1,200 volts per commutator. An 800-cu.ft. blower motor equipped with ball bearings is used to ventilate the main propulsion motors, one of which is mounted on each axle. Air is obtained from the inside of one of the hoods. In this way the maximum protection from snow and dirt is afforded the driving motors. The air is conducted through an air duct formed by closing the space between the two center channels with a piece of iron sheeting and lead directly to each motor through a flexible air connection.

A feature of the electrical equipment is that all auxiliary circuits are fused to a common bus bar. Fuses of the expulsion type are used. A separate auxiliary control cutout switch is mounted adjacent to the auxiliary fuses so that by opening this switch the auxiliary fuse bus bar is dead and fuses may be replaced without danger to the operator.

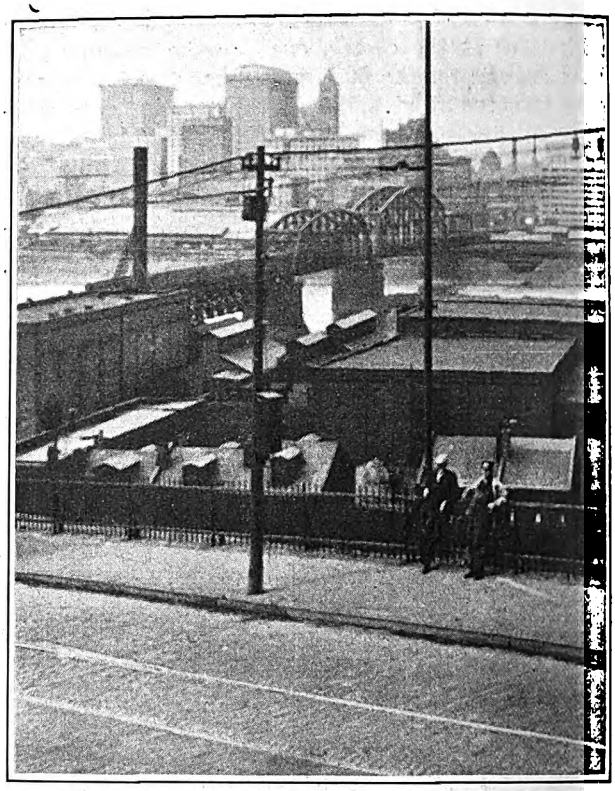
Resistance grids are mounted close to the ceiling directly under ventilators with the other main apparatus below and adjacent thereto. This arrangement, together with solid covers which inclose the greater portion of the control cabinet, allows the head of the grids to set up drafts which ventilate the control compartment. On account of the severe snows encountered, the headlights are mounted on swivel pivots directly under the roof overhang at each end of the cab.

Automatic Derails Protect Grades

RAILWAY operation in Pittsburgh has always been complicated by the existence of many long and steep grades. One of the worst of these grades is on Brownsville Avenue beginning at the south end of the Smithfield Street bridge and rising to the top of the south hills. To protect car operation on this street the Pittsburgh Railways installed a derail switch midway up the hill. Under this arrangement it was necessary for inbound cars coming down hill to stop while the conductor alighted and pulled the derail.



Car Passing Under Contactor of Automatic Derail on Steep Hill in Pittsburgh



Relays for Operating the Automatic Derail Switch Are Located in the Pole Box

Recently, however, two difficulties arose in connection with this operation. In the first place the opening of the Liberty Tunnels, which are reached via Brownsville Avenue, greatly increased the volume of vehicular traffic on that street. At times this was so great that the operation of alighting and pulling the derail was one of considerable danger. The desire of the railway to operate one-man cars on this route at certain times also complicated the situation.

A solution was found in the installation of an automatic derail switch. This is so arranged that passage of a car under the contactor causes a primary relay to close. This in turn actuates a second relay, which, however, is equipped with a slug on the outer end of the armature, causing it to vibrate. The derail remains open until this vibration ceases and the armature comes to rest in a closed position. Ten seconds is the period of time theoretically required, although in actual practice it varies somewhat. This time lag is sufficiently long so that a car going down hill must come almost to a dead stop between the contactor and the derail. Passage of the car under a second contactor opens the relay and the switch.

Installations similar to the one here described have been made by the Pittsburgh Railways in a number of other locations, all of which have operated satisfactorily to insure safe operation on steep grades.

In defining the functions of the "holding companies" in the public utility field, Samuel Insull, president Commonwealth Edison Company, Chicago, said recently that "most of the outstanding developments of the last twelve or fifteen years in the electrical field are due to the so-called holding companies, which have performed prodigies in spite of the handicap of the inept family name." Financially speaking, this type of company is an elaboration of the "investment trust" which was long since standardized in Great Britain.

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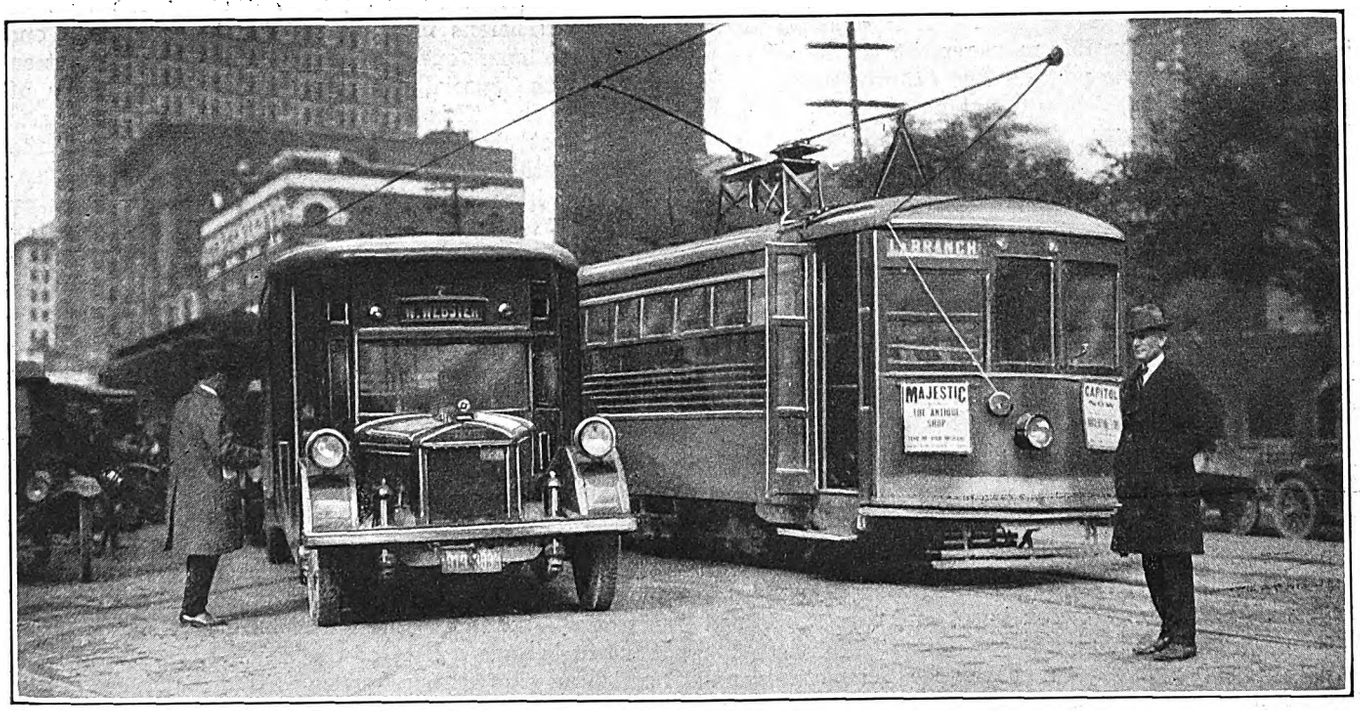
Electric Railways Keep Pace in Rapidly Growing Texas Cities

Local Street Railway Lines and Interurbans Have Played an Important Part in the Development of Houston, Dallas, San Antonio and Fort Worth —A Spirit of Co-operation Has Been Built Up by Close Attention to Public Demands—Buses Are Operated by Railways in Houston and San Antonio

By Charles Gordon
Western Editor ELECTRIC RAILWAY JOURNAL



Buses and Cars Are Operated at the Same Fare in Houston. Transfers Are Issued Free

IN THE State of Texas one is met on every hand with unmistakable evidence of rapid development and growth. There is a spirit of friendly rivalry between the larger cities and a strong feeling of community consciousness and civic pride has been built up. Among the leaders in these communities transportation is recognized as an all-important factor in civic growth, and consequently the problem of financing extensions of service continually confronts the managements of the properties serving several of the larger cities.

Texas is a "home rule" state. Regulation of utilities is in the hands of local authorities in the various cities, who are directly subject to the opinion of the users of utility service. Under these conditions the railways are in a sense regulated by their own customers, and the problem of winning public favor and confidence is essential to successful operation. This has been accomplished to the extent of building up a generally fair attitude on the part of public officials in the several cities.

The railway managements have accepted their responsibility for rendering a complete transportation service and providing for newly built-up territory. The communities, on their part, have come to learn that unified transportation service under a single management is of utmost importance to healthy and normal civic development. Considerable progress has been made in working out arrangements to prevent the over-extension of transportation lines into thinly populated real estate projects. Real estate men are gradually being brought to accept the principle of assuming the cost of transportation extensions into new territory where available traffic will not support the new transportation service.

NEW HOMES REQUIRE TRANSPORTATION

Development of the cities is based on agricultural, industrial and commercial growth throughout the state. Many homes are being erected for workmen or commercial employees. Consequently, rapidly growing residential sections are largely populated by good street car riders. In both Dallas and Fort Worth street cars are demanded in preference to buses, because of the permanence which the laying of rails lends to the element of transportation in a new community. In Houston and San Antonio, however, the bus has been

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adopted for serving certain sections. Although some of these lines are in the nature of a preferred or de luxe service, the bus is also being used for the extension of service into new territory in preference to the heavy investment required for electric cars and rail extensions.

Houston is a keen contender for business and industrial leadership of the state. Completion of a ship channel to the Gulf of Mexico has transformed this former inland city into a seaport and has put it into the position of becoming the water gateway into the vast resources of the Lone Star State. Important industries have found ideal conditions for development, and an optimistic view of the city's future importance seems to be well justified.

The Houston Electric Company has been actively identified as a progressive force in the community. After a period of serious jitney competition, the city was finally brought to see that a single transportation agency under responsible management is the only economically sound civic policy. The railway management has shown a sincere desire to extend its service to keep pace with the growth of the city. The bus has been used for this purpose, particularly where a demand for service has developed in newly built-up communities with paved streets where rail construction cost was considered excessive.

Buses Replaced Jitneys

Some of the original bus lines in the city were put in to replace former jitney lines whose removal was made contingent on the institution of such bus service. The Houston Electric Company does not have an exclusive franchise to operate buses, but is dependent on popular acceptance of the principle that all transportation service should be rendered by one management. Due to this combination of conditions, buses at present are operated for the same fare as that charged on the street cars, namely, 7 cents cash and four tickets for a quarter. Transfers between buses and cars are issued free.

An accompanying map shows the complete transportation system, including both car lines and buses. A total of 21 buses are owned. These include seven Yellow Coach Model Z, 29-passenger buses, eleven Fageol buses with 29-passenger steel bodies, built by the American Car Company, and three Reos with nineteen-passenger city type bodies.

The Austin bus line extends southwesterly from the business district through a thickly populated residential section. Operation of this line was started in place of a former jitney route. This is a comparatively short line with heavy traffic. The base headways are eight minutes in the morning and six minutes in the afternoon. During the rush hours, additional service brings the headway down to four minutes. Fageol equipment is operated, and schedule speeds of approximately 10.25 miles per hour are maintained. The bus route parallels the South End car line, which is a single-track line with a large loop at the outer terminus. At some points inbound cars on this loop are approximately five blocks from a built-up residential section of considerable size. For this reason, the demand for bus service was insistent.

Due to the heavy density of traffic and the short route distance on this line, it has shown earnings of $13,000 a year above interest, depreciation and operating charges, even on the low rate of fare that is charged. Other lines in the city that do not have the same traffic characteristics have run up substantial losses. This is true of both the West Webster and the East End lines. In each of these cases the routes are considerably longer and the traffic much lighter than on the Austin line.

Experience with existing bus routes has convinced the Houston Electric Company management that bus service should be essentially a preferred type of service at a substantially higher fare than that charged on street cars. W. E. Wood, manager, is a firm advocate of the principle that all bus operations should be made self-supporting and that a rate of fare should be charged high enough to avoid making street car riders pay for deficits incurred in furnishing bus service to thinly populated districts.

Several interesting plans are being worked out to make specially benefited property carry the cost of service extensions into unprofitable territory. In one case a Reo bus is operated two trips per day to a cotton mill for the special convenience of the employees of this concern. This service is rendered on the basis of a direct charge of 20 cents per mile against the owners of the mill. In another case, a requested extension to a high-grade residential development is being negotiated on the basis of a guarantee of operating expenses by the real estate operator. In the working out of this arrangement the terms of contract and form of bond are being carefully studied. The purpose is to protect the transportation company against discontinuance of the agreement by the real estate operator before the district has been properly built up. Once a line is established, it is assumed that a demand for continuance of service, even at a loss by the transportation company, would be made if such a bond were not put up as a guarantee over a certain period.

In still another case a bus line is being contemplated as a substitute for a section of an existing rail line that must be either torn up or rebuilt. This service will extend to the Harrisburg section, which is about to become a part of the city. It is proposed to furnish an express bus service to this community from the business district, which will be operated at a minimum fare of 10 cents.

Buses in Houston are operated as an integral part of the railway organization. Drivers are selected from among the trainmen and are paid the same rate as one-man car operators, namely, 54 cents per hour. The superintendent of transportation has charge of the operation of buses and the master mechanic has charge of their maintenance.

Building Friendly Public Relations

Frank understanding and a mutual endeavor to play fair in all respects are producing favorable and friendly relations between the company and the representatives of the community. Paid newspaper space is being used to tell the public about the operations of the transportation property. It is believed that a policy of frank co-operation is to the advantage of the company in gaining for it the complete confidence of the community.

Some general idea of the progress which has already been made in this direction is given by remarks made by D. J. Kirk, public utility commissioner of the city, before the recent annual meeting of the Southwestern Public Utility Association, held in Houston in May. He said there that most troubles between the

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public and its utilities are attributable to misunderstandings and suspicion. He expressed a firm conviction in favor of unified operation of all transportation facilities in a given community, and also opposed the indirect taxing of car riders through the requirement of paying for street paving out of car fares.

DALLAS AND HOUSTON ARE RIVALS

Dallas is also an active and energetic contender for industrial and commercial supremacy. From the standpoint of population, it is generally recognized that the two cities are close contestants for honors.

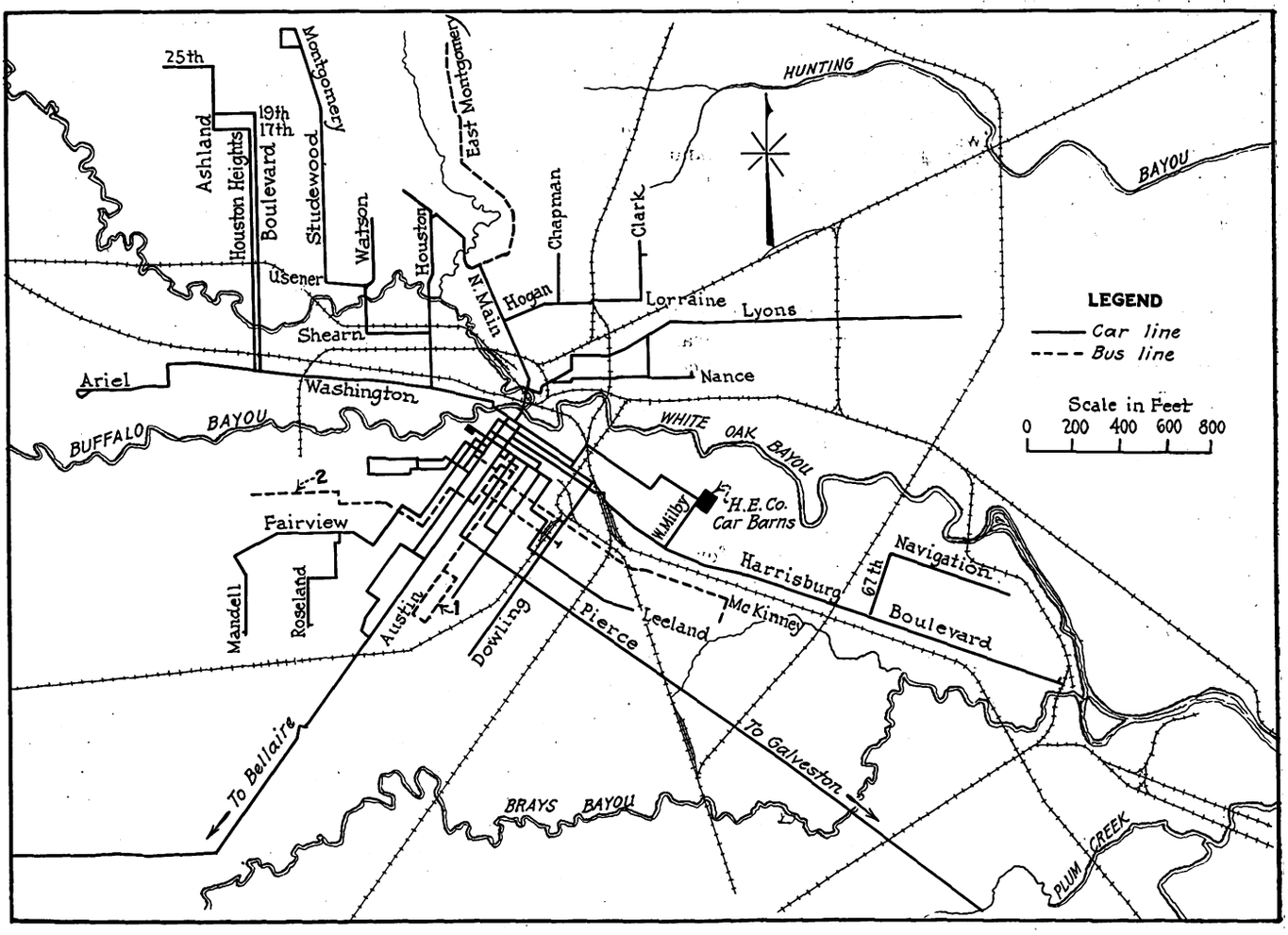
Interurban electric railways have played a large part in the development of Dallas. A modern terminal building and station, owned by the Dallas Railway, serves as the terminus for interurban lines radiating in all directions from the city. To the west, the Northern Texas Traction Company operates to Fort Worth, where connection is made with interurban cars operating to Cleburne. Thirty-minute service is given between the two cities. Local cars and non-stop limited trains are alternated throughout the day. The Texas Electric Railway extends southwest to Waco, southeast to Corsicana and north to Sherman and Denison. Hourly service with alternate limited and local cars to each of these cities is furnished.

Northwest from the city, the Texas Interurban Railway serves Denton. East from Dallas its line reaches Terrell. Hourly service, similar to that given by the other roads, is furnished. A marked distinction exists in the type of equipment operated by the Texas Interurban Railway. That of the other lines out of Dallas is of the heavy, high-floor interurban type, while low-floor, light-weight cars are used for both passenger and express service by the Texas Interurban Railway. The line to Denton is operated for most of the distance over the tracks of the M-K-T steam railroad. A complete description of this novel operation was published in the April 25, 1925, issue of ELECTRIC RAILWAY JOURNAL, page 647.

AUTOMOTIVE COMPETITION SERIOUS

Completion of good highways between some of the principal cities and towns in northern Texas has resulted in serious competition to the interurbans from private automobiles and buses. Texas has no regulatory law covering the operation of buses and until such law is obtained the problem of protecting the interurban investment is serious. The buses themselves are not free from competition. This has resulted in duplication of lines, which has made it extremely difficult for the interurbans to make any traffic interchange arrangements with bus operators, even on routes where such arrangements would build traffic for both by making the buses from outlying towns feeders to the interurbans.

Between Dallas and Fort Worth an independent bus line, operating Fageol intercity equipment, is making a serious fight for patronage with the Northern Texas Traction Company. The latter has been able to hold a



A Combination of Rail and Bus Lines Furnishes Houston with Complete Transportation Service Under a Single Management

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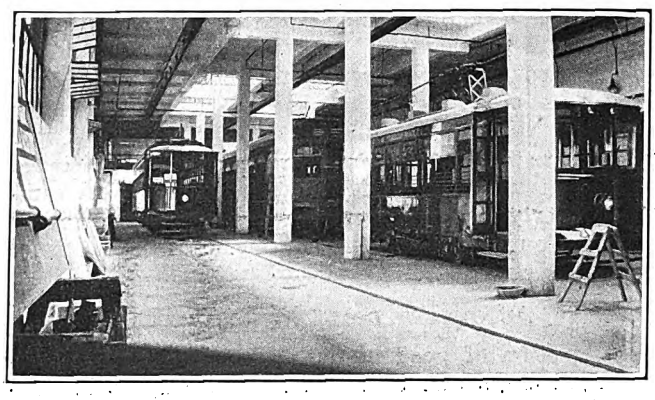
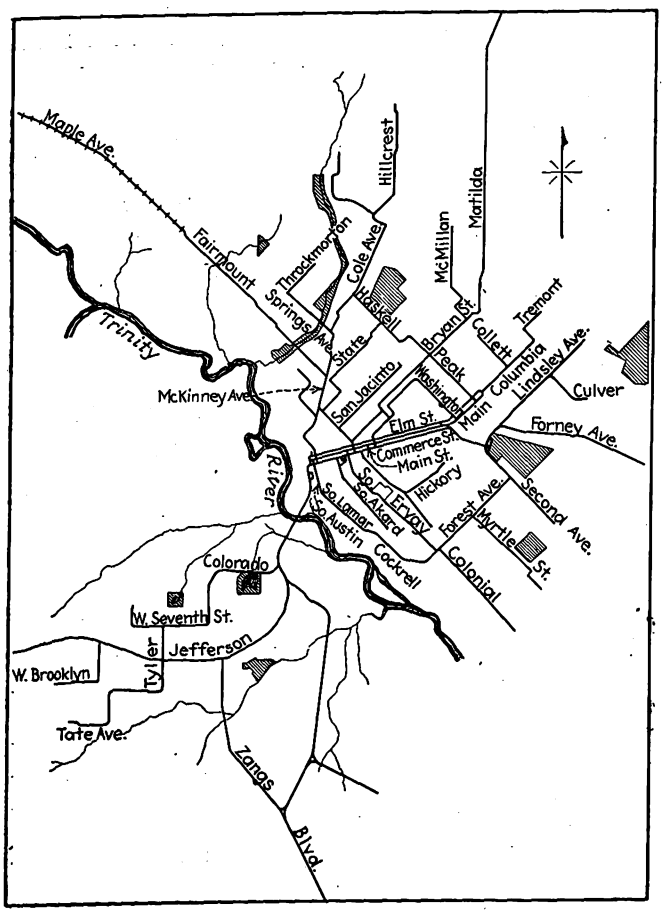


A New Paint Shop, 50 Ft. x 160 Ft., Has Been Built in Fort Worth. Brightly Painted Cars Are Considered a Valuable Aid in Merchandising Service

substantial part of the traffic by the institution of non-stop express service with its new "Crimson Limited" trains. Despite this superior service, however, it is estimated that buses are taking nearly 20 per cent of the traffic between the cities.

The Texas Electric Railway has in the past been a profitable enterprise and has furnished a high-grade service to the communities it serves. This company also operates local street cars in some of the smaller towns on its lines. Buses and automobiles have made serious inroads on receipts, in spite of determined efforts to improve and sell the railway service. Not only is direct advertising used to build railway business, but advertising souvenirs are distributed over a wide territory contributory to the lines. In some of the smaller towns, where track reconstruction programs have become necessary, plans are being made to substitute buses for the local rail service.



Rail Lines Have Been Extended into the Rapidly Growing Residential Sections of Dallas. In Some Cases Real Estate Developers Have Assumed the Cost of New Railway Construction

Dallas Attacks Congestion Problems

The Dallas Railway operates all of the street cars in the city. Both one-man and two-man cars are used. Double-truck one-man cars equipped with automatic treadle controlled rear exit doors are operated through the congested business district without difficulty. Street fare collectors at points of heavy traffic assist materially in expediting the loading of cars during the rush hours.

Commerce, Main and Elm Streets constitute the main arteries through the business district. Many lines converge on these streets and during the rush hours the traffic is very heavy. Narrow downtown streets add to the problem, but unusually rigid parking restrictions help to relieve the situation materially. Even taxicabs are prohibited from parking on the streets and taxicab companies are required to maintain downtown garages instead of using the already congested streets as cab stands. Synchronized traffic control signal systems are installed in the business districts of Dallas, as well as in Houston, San Antonio and Fort Worth. In all these cities pedestrian traffic moves on signal with vehicles. This regulation is closely enforced, and vehicular traffic is thus enabled to move rapidly at intersecting streets.

Residential sub-divisions in Dallas are being developed rapidly. These are striking evidence of the growth in population. As a result, however, the problem of making rail extensions is an acute one. In addition to new lines the rapidly growing demand for additional car service has required the company to carry on a steady program of double tracking existing single-track lines.

Rail Lines Preferred to Buses

Extensions are being made by rail, rather than by bus. No buses are operated in the city and the demand for them has not been pressing. Narrow streets and congested traffic have been limiting factors of importance. Another has been that the sub-dividers of property and the new residents of built-up districts have insisted on car service rather than buses because of the permanence that is given to the transportation service, once rails are laid in the streets. In some locations transportation extensions have been requested by real estate operators before population would warrant the expenditure for laying rail. Under such conditions, the cost of construction is being met by the real estate development companies. Several extensions of this type have been put in recently.

A broad policy of cultivating friendly public relations is maintained by the company. No small part of this is the work of the transportation department among its employees who come in direct contact with the public. New men are not only carefully selected but, together with older employees, they are carefully supervised and instructed regarding their relations with the company's customers. New employees are recruited to a large extent from the rural communities of the state and consist of young men who have come to Dallas seeking employment. These men have been found to make the finest type of trainmen after having been properly instructed in their duties.

Contact with the local newspapers is maintained

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through the publicity department of the company. One example of the favorable results that are obtained by co-operation with the press of the city is the method followed in the case of accidents. For some time it has been the practice to furnish the newspapers with a full report of every important accident that occurs, regardless of whether or not the company was at fault. No attempt is made to color such stories in favor of the company. All the facts are given just as they occurred and as accurately as the company is able to determine them. So successful has this attitude of frankness been that the press of the city has come to rely on these reports and has largely discontinued the practice of sending reporters out to cover street railway accidents.

Fort Worth Merchandises Service

Fort Worth, like the other large cities of the state, is growing rapidly. The city lines are operated by the Northern Texas Traction Company along with the interurbans to Dallas and Cleburne. Buses are not operated by the railway in Fort Worth and necessary extensions of service have up to the present time been made by rail lines.

Since winning the 1924 Coffin prize the company has by no means let down in its efforts to improve its service and then merchandise it by modern business building methods. Staff meetings are devoted largely to discussions of business building ideas. Some of the sales methods used will be described in a special article to be published in a subsequent issue.

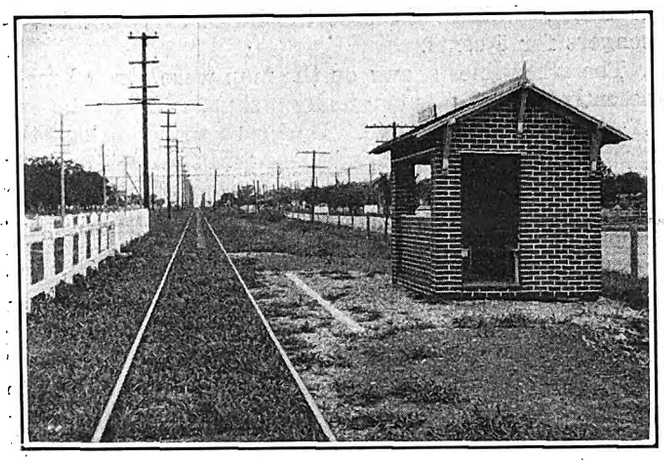
The Fort Worth management is a firm believer in the value of paint on its cars as a help in selling its service. A new paint shop recently has been completed. This is a concrete structure which measures 50 ft. x 160 ft. It has three tracks, each 130 ft. long, for the storage of cars to be painted. At one end a balcony 20 ft. x 50 ft. covers a paint storage vault and men's wash room below. This balcony is used for trimming, sign and sash work.

Progressive Ideas in San Antonio

San Antonio, the oldest city in Texas, is also one of the oldest in the country. Its railway, however, is progressive and well abreast of the times. A policy of retiring older equipment, to be used only in emergency service, has been in force for some years and has resulted in the gradual replacement of old and heavy equipment with modern light-weight cars. As another phase of this policy, the bus is being used to supplement the rail system wherever it provides improved service or promises reduced operating cost.

A total of 120 street cars are now operated. These include 64 double-truck two-man cars and 66 single-truck one-man cars. Bus equipment consists of seven 29-passenger Fageols, one 29-passenger Yellow Model Z and eleven 21-passenger Reos.

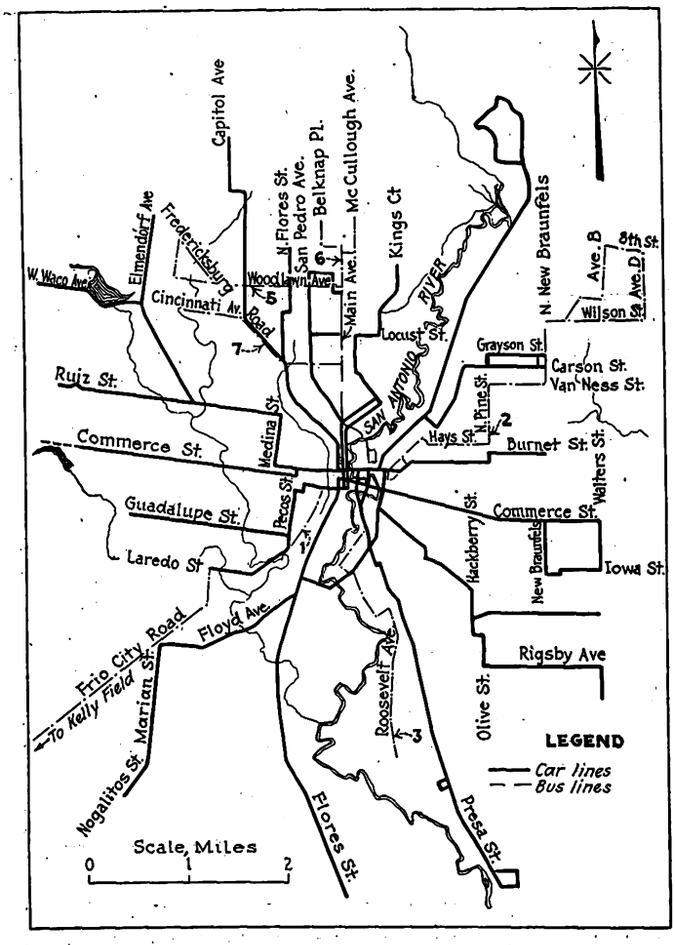
Car and bus routes in the city are shown on an accompanying map. Bus route 1 on the map was put in operation Dec. 1, 1923, to replace a single-track car line on which expensive reconstruction work would have been needed to keep it in service. This line serves South San Antonio and Kelly Field, an important army flying field. One Fageol bus is operated on an hourly headway during the base period and a second bus of the same type is put on during the morning and evening to reduce the headway to a half hour. Although this line is unprofitable, the use of buses materially reduces the losses over what they were when cars were used.



Small Wayside Stations, Between Dallas and Fort Worth, Are Made Attractive

An old rail, sunk flush with the ground in front of these stations, is painted white to mark the clearance limit of passing trains. A safety message appears on this marker. Note the fence between the tracks.

Line 2 on the map runs between the Alamo Plaza and Fort Sam Houston. This was put into service in September, 1923. Two Fageol buses in all day service furnish a twenty-minute headway, and two tripper buses during the morning and evening reduce the headway to ten minutes. This line gives service to Fort Sam Houston in addition to an existing car line which also reaches the fort. The fare on the cars is 6 cents, while on the buses throughout the city the fare is 10 cents, with a 4-cent charge for transfers from cars



Buses Supplement the Rail Lines in San Antonio. Most of the Bus Lines Terminate in Small City Parks Near the Business District

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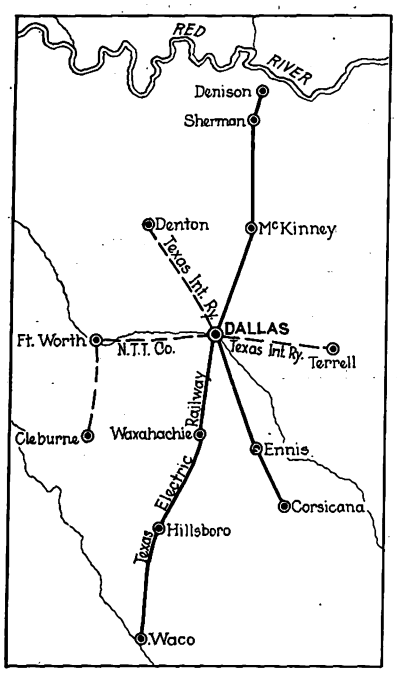
to buses. Within the fort the buses carry local passengers for 5 cents.

The other lines shown on the map were started more recently. No. 3 was originally a shuttle line at the end of the existing car line. Under these conditions the riding was very small and the operation was entirely unprofitable. Later the bus route was established from the business district so as to interfere as little as possible with the rail line and at the same time reach a district near the end that was previously inaccessible to the cars. Under these conditions the operation has been much more successful than as a shuttle feeder. One Reo bus furnishes 30-minute service over this line.

Practically all of the bus lines that radiate out into various sections of the city terminate in small public parks near the business district. At these points bus waiting stations have been established. Time clocks have been erected by the company for the convenience of passengers and employees and the city has provided benches for their comfort. A bulletin board carries a time-table so that the time of departure of the various lines can be conveniently determined. One of these park waiting stations, which is the terminus for several important lines, is directly across the street from the St. Anthony Hotel.



Dallas Is the Center of an Extensive System of Interurban Lines Which Have Played an Important Part in the Development of the City

Line 5 was put in operation in November, 1924. Two Reo buses furnish twenty-minute service on each leg of the route. Line 6 has been in operation since May of the same year. This is also in two divisions and three Reo buses furnish the required service. In this case one bus is assigned to each division, while the third alternates on each trip. One Reo bus is also operated on line 7, making the headway 30 minutes. As the buses on lines 5, 6 and 7 converge on a common route as they approach the business district, the schedules of the various routes are fitted into each other and the headway is gradually decreased.

As in the case of Houston, the bus and rail service are handled together by the same operating organization. Bus drivers are selected from the train service and are paid the same rate as one-man car operators. To keep men from switching back and forth between cars and buses, however, the seniority lists on buses are open only once a year, so that a man who has picked a run back on the cars after once having been on the buses does not have the opportunity of changing again for a year.

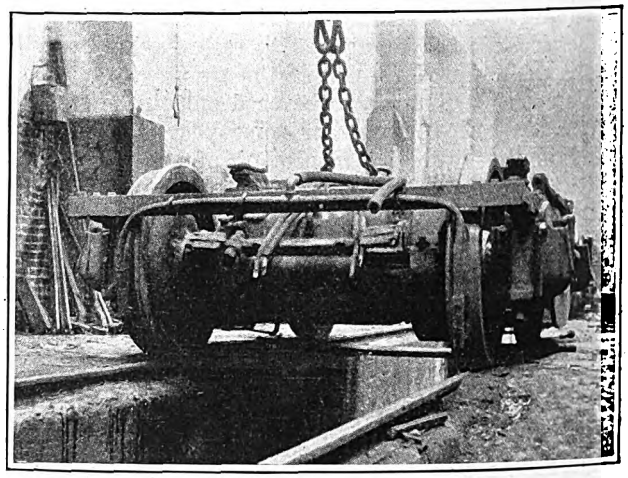
There is one distinct difference between the views of the Houston and San Antonio managements on the subject of bus taxation. In San Antonio the bus is taxed so as to put it on a comparable basis with street cars so far as tax burdens are concerned. A special license fee of $5 per seat is charged by the city for paving maintenance. This is estimated to be equivalent to the cost to the company per car seat operated for maintaining the paving between its tracks on car line streets. In addition, a $200 state tax, together with federal and special taxes, makes the total annual cost per bus approximately $600.

In Houston the management has contended for moderate taxes on the bus. It has been held that the car rider is now taxed unjustly for the cost of maintaining paving used by other vehicles and should be relieved of this burden as rapidly as possible. For this reason it is also held that such relief for the car rider would then put the bus and car on a comparable basis and would be a much fairer method of equalizing matters than to load the bus down with extra burdens just because the cars are already in this predicament.

San Antonio has been the more fortunate in its experience with buses in that a minimum fare of 10 cents is charged and a transfer charge is also made. Houston has demonstrated by experience that its fare of four tickets for a quarter with free transfers will not support the bus-operating costs except on very short lines of heavy traffic. There is prospect in Houston of converting the people of the city to the idea of making bus operation self-supporting. In both cities the managements look on bus service as a preferred type of service which justifies a rate of fare high enough for its proper operation.

Sand Outlets Attached to Trucks on Interurban Cars

THE Washington, Baltimore & Annapolis Electric Railroad has adopted the practice of attaching sand outlets directly to the tracks of its interurban cars. This insures greater reliability in sanding track directly in front of the wheels, particularly on curves where the car body and the trucks are out of line.



Sanding Tracks on Curves Is Facilitated by Having the Pipes Attached to the Car Truck in This Manner

A 1-in. pipe bent to the shape of an inverted letter U is used. At the ends slightly larger pieces are attached to distribute the sand over the railhead. From the center of the horizontal section a tap is taken off through a rubber hose to the sand box. One sand box is located at each end of the car. Compressed air is used to force it through the pipe on to the track.

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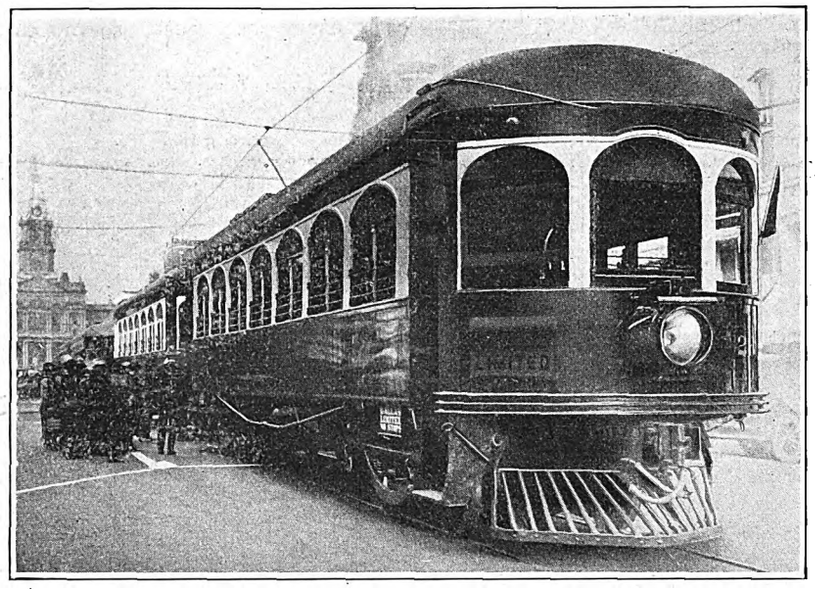


At Left, a Short Canvas Awning and Tail Sign Give an Observation Car Effect to the Rear End of the Train. At Right, Crimson and White Paint Are Combined to Good Effect in Improving the Appearance of This Interurban Equipment

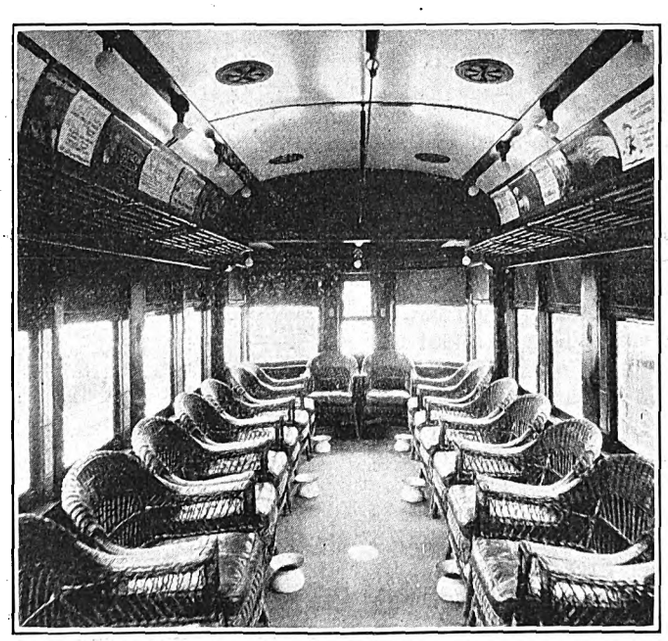
"Crimson Limited" Gives Attractive Interurban Service

Northern Texas Traction Company Improves Cars for Fort Worth-Dallas Non-Stop Service with a Special View to Merchandising—Combination of Colors Used to Give Streamline Effect

NON-STOP limited service between Fort Worth and Dallas, Tex., is given hourly by the new "Crimson Limited" trains of the Northern Texas Traction Company, recently installed. These trains are the result of the company's policy of building riders by combining three factors in its equipment; namely, an appearance which suggests speed and creates a desire to ride, fast service and comfortable seating.

Paint has been used to good effect in changing and improving the appearance of the cars, which had been in service a number of years and which in many respects are similar to the type usually operated on other high-grade interurban properties. This has been done by adopting a brilliant crimson for the letterboard and side panels, combined with white for the posts and drip rail. These bands of sharply contrasting colors tend to give the cars an elongated appearance by producing a streamline effect. In two-car trains, consisting of a motor and trailer, the effect is even more pronounced.

At the rear end of the trailer, a short awning adds an observation car appearance. An illuminated tail sign helps to carry out this idea. Seats of parlor-car type have been installed in the rear car. This is used as a club car and no extra charge is made for its use. It is designed primarily to appeal to the business man traveling between the two cities and to offer him in comfort a service which will induce him to make the trip by electric railway instead of by automobile.



The Trail Car Is Equipped as a Club Car for the Convenience of Business Men Using the Service

The front car is entirely equipped with cross-seats. A smoking compartment of the type usually found in interurban cars is provided at the front end of this car. All cross-seats in the main passenger compartment have linen back covers similar to those used by steam roads on chair cars. These covers are visible from the street, and help to carry out the impression which is given by the rest of the train—that of first-class service.

Two-car trains of this type are operated on hourly headway throughout the day. A local service is also given at hourly intervals. This is alternated with the limiteds so that there is a train leaving the terminals at each end every half hour.

The "Crimson Limited" service has a distinct merchandising value, obtained

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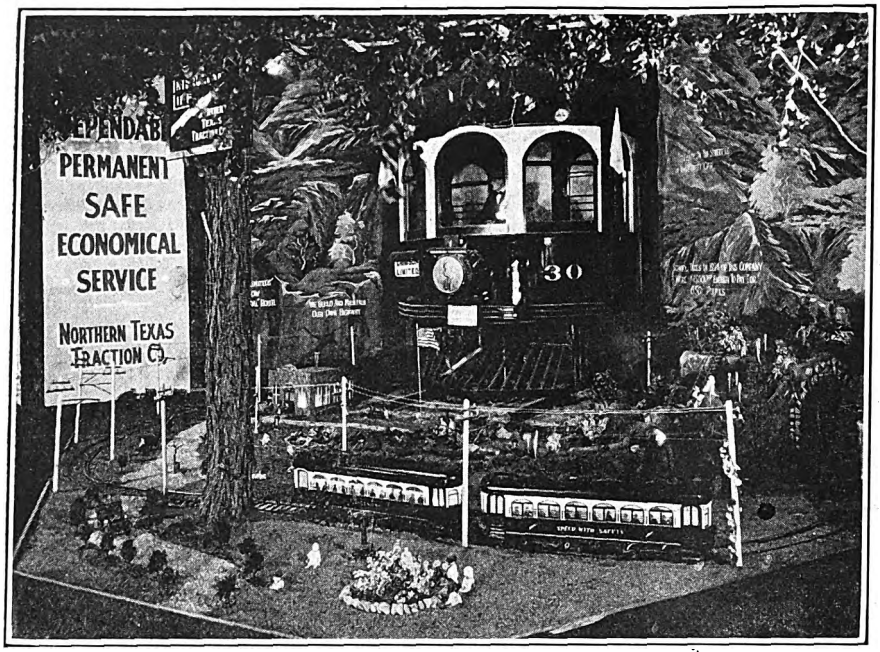


This Attractive Exhibit Created a Great Deal of Comment at a Recent State Agricultural Exhibition

by comparatively small expenditure for changes to the equipment. The new name is being capitalized in many ways for the purpose of building traffic. One good example is the exhibit shown in an accompanying illustration, which was recently displayed at the Texas Fat Stock Show. In this, a full-sized model of the front end of one of the new trains was set up in a canvas drop so that a realistic effect was produced. In the foreground, a miniature model of the train was electrically operated on a circular track. Carefully worded signs were placed about in this setting to call attention to interesting things concerning the company's operations.

Many other forms of publicity used by the company are being employed to advertise the service of the new "Crimson Limited." As part of this program an active campaign of personal solicitation is under way to call to the business man's attention the advantage of using this service.

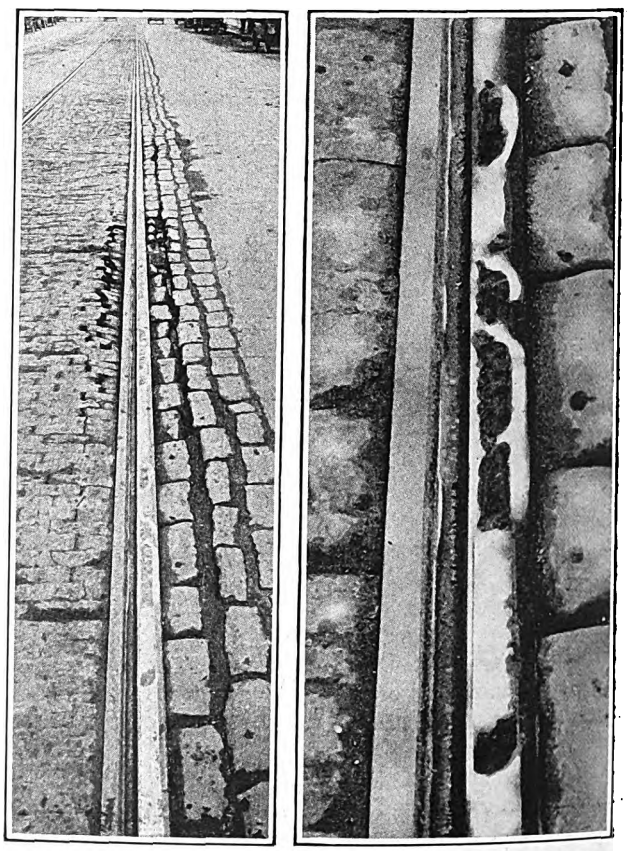
Experience with Surface-Hardened Rail in Toronto

THREE years experience with surface-hardened rail treated by the *in situ* process in Toronto has shown a number of interesting results, but in the opinion of the management of the Toronto Transportation Commission its success or failure has not been demonstrated conclusively. In favor of the process, it has been found that the rate of wear on untreated rail is from two to 2½ times as fast as on treated rail. This is about the same as the experience of a number of British tramways. Moreover, it appears that treatment by the *in situ* process has lessened the recurrence of rail corrugation. On the other hand, serious difficulty has been experienced with scalings.

In 1922 this treatment was applied with a high-pressure blowpipe to sections of track on Danforth Avenue, College, Yonge and Queen Streets. The following year it was applied with medium and low-pressure blowpipes to sections of track on Bay Street and on Lake Shore Road. Scalings appeared in the spring of 1923 on Danforth Avenue, College and Yonge Streets. A year later additional scalings occurred on Danforth Avenue. Examination of these sections early in the spring of the present year showed a number of additional defects on Danforth Avenue, but no change in the other treated sections.

Scalings on track in Danforth Avenue are shown in an accompanying illustration. These were so serious that it was not considered economical to make repairs by welding. The outer rail has therefore been replaced. An interesting fact in this connection is that these scalings have all occurred on the outer rail of double-track construction, the devil-strip rail not being affected except in so far as evenness has developed on account of defects in the outer rail. As yet, no defects have occurred in the sections treated in 1923 with a low-pressure blowpipe.

The following points have been noted by the management, but no adequate explanation of them has yet been found: (1) That practically all defects have occurred on the curb side rail; (2) that practically all scalings have occurred during the colder months; (3) that by far the greatest number of defects have occurred on 90-lb. rail which had been in service about nine years; (4) that practically all defects have occurred where the treatment was made with a high-pressure blowpipe; (5) that on Danforth Avenue the thin treated area along the top of the rail near the gage line has become roughened, though it can hardly be classed as scalings.



Scaling Has Occurred in Toronto on Surface-Hardened Rail Treated by the In Situ Process

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Association News & Discussions

Electrification Considered by N.E.L.A.

United States Installations Small, Although Comprising 25 per Cent of World's Total—Standardization of System Considered Essential—Electric Railway Men Among New Officers of the Association

STEAM railroad electrification was the subject that predominated at the concluding session of the National Electric Light Association convention, held on June 19 at San Francisco. In its report the association committee on the electrification of steam railroads told of what had already been accomplished in this country and abroad and what was under contemplation in the United States.

Speaking on the subject "Electrification of Transportation," Paul S. Clapp of the United States Department of Commerce outlined the advantages of railroad electrification as well as the practical difficulties under which the railroads would eventually change their motive power from steam to electricity.

"The movement of electrification will be hastened by action in at least two major directions," said Mr. Clapp. "First, by the further development of interconnected central station systems as a source of power supply; second, by the adoption of certain standards which will enable us to develop a unified transportation system and simplify the equipment.

"Interconnected systems can rightfully be considered as more than a substitute for electric power plants which the railroads would otherwise be required to build. They are themselves an impelling reason for electrification. No means has yet been devised by man for more complete utilization of natural resources—fuel and water—than these interconnected systems. The huge central stations made up of large efficient units operated under closest and constant supervision burn coal with maximum results. No more efficient units of such size for conversion of fuel into energy have ever been built. They are able to accumulate large fuel reserves at advantageous times. They can use lower grades of fuel than are possible in locomotives. Such plants can be advantageously located for coal and water supply. Through interconnection large water powers can be developed and more widely distributed. Secondary water power which arises from seasonal flow of streams is utilized in larger quantities.

"All of this results in more economical production and distribution of power. It insures the continued presence of a reliable and adequate power supply, such as is absolutely essential for electrification, and makes this power available at points wherever it may be needed. It enables us to apply water power effectively to transportation. Security of power supply against interruption is safeguarded, since the source of energy is not limited to a single station. Fluctuations in power demand with variations in traffic are more readily absorbed. Additional power required for increase in traffic or extensions will be available without new investment of capital by the railroads."

Uniform plans for electrification, the speaker declared, are an essential if we are to develop a co-ordinated national transportation system. A patchwork of railroad mileages with a variety of electrical characteristics spells inefficient operation, lacks flexibility and is wrong from the standpoint of national defense.

COMMITTEE EMPHASIZES NEED FOR STANDARDIZATION

The committee on the electrification of steam railroads (Frank R. Coates chairman) quoted in its report the statement made before the A.I.E.E. on May 5, 1925, by the Secretary of Commerce, reviewed what has been accomplished in steam road electrification in this country and the work contemplated, and gave an outline of what has been accomplished abroad. In the statement quoted, Secretary Hoover emphasized particularly the need for standardization both in railroad and power company generating and transmitting equipment in order to prevent waste and facilitate the development of a co-ordinated electrified transportation system. In reviewing past electrification the report said that all of these installations have been superior to the steam service replaced. This has been particularly true in respect to availability for service, flexibility in operation, dependability and economy.

SUMMARY OF ELECTRIFICATION, ALL FOREIGN COUNTRIES

Country	Route Miles	No. Locomotives	Total Tons
Norway	125	43	3,064
Sweden	744	115	11,406
England	28	33	2,328
Germany	635	312	32,515
Austria	543	85	5,107
Switzerland	636	224	21,259
Italy	563	526	40,624
France	659	349	27,618
Spain	80	22	1,595
Canada	38	17	1,283
Mexico	30	10	1,540
Chile	148	45	4,402
Brazil	27	25	2,325
Argentina	...	2	147
Australia	..	2	100
New Zealand	8	5	268
South Africa	171	78	5,820
Japan	48	56	4,064
Java	31	6	420
Total	4,504	1,955	165,894

PLANS GOING FORWARD ON SEVERAL RAILROADS

The electrification plans which are now part of construction programs concern the systems of the New York, New Haven & Hartford Railroad Company, Norfolk & Western Railway Company, Illinois Central Railroad Company and Virginian Railway Company.

The first two companies have parts of their lines already electrified, the New York, New Haven & Hartford Railroad Company having completed virtually 100 per cent electrification between New York and New Haven. The Illinois Central has already started electrification of its suburban lines, power to be supplied by the Commonwealth Edison Company, and the Virginian Railway Company is completing construction on a part of its system with heavy grades, particularly to handle heavy coal trains. The Pennsylvania Railroad is carrying out extensive tests of equipment in preparation for electrifying its main line between New York and Washington and additional Philadelphia suburban lines. The Great Northern also is making extensions to its electrified system, and railroads having tracks within the New York City limits are making plans for complete electrification in accordance with recent legislation.

In foreign countries electrification has made greater progress in the past few years than in this country, this progress being largely due to a desire to use hydro-electric power and conserve fuel. The table gives a brief

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 17-18—Mid-West Claim Agents' Association, Hotel Jefferson, St. Louis, Missouri.

July 22-25—Pacific Claim Agents' Association, Hotel Biltmore, Los Angeles, Cal.

July 24-25—Central Electric Railway Accountants' Association, Hotel Waldorf, Toledo, Ohio.

August 12—Metropolitan Section A.E.R.A., Summer Outing at Pelham Bay Park.

August 13-14—Wisconsin Utilities Association, Hotel Wausau, Wausau, Wis.

August 27-28—Iowa Electric Railway Association, Operators' Section, Hanford Hotel, Mason City, Iowa.

Sept. 10—Central Electric Railway Master Mechanics Association, Grand Hotel, Anderson, Ind.

Oct. 5-9—American Electric Railway Association, annual convention and exhibits, Young's Million Dollar Pier, Atlantic City, N. J.

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summary of progress in electrification abroad.

The following officers were nominated and elected for the ensuing year:

President, J. E. Davidson, Nebraska Power Company, Omaha, Neb. Vice-president, R. F. Pack, Northern States Power Company, Minneapolis, Minn.; H. T. Sands, Charles H. Tenney & Company, Boston, Mass.; P. S. Arkwright, Georgia Railway & Power Company, Atlanta, Ga., and J. B. Miller, Southern California Edison Company, Los Angeles. Treasurer, W. A. Jones, H. L. Doherty & Company, New York. The members at large comprise Franklin T. Griffith, Portland, Ore., ex officio; H. C. Abell, New York; H. M. Edwards, New York; Edwin Gruhl, New York; E. W. Lloyd, Chicago; I. E. Moultrop, Boston, and Harry Reid, Indianapolis.

The electrical manufacturers' representatives are E. M. Herr, Westinghouse Electric & Manufacturing Company; Gerard Swope, General Electric Company, and W. A. Layman, Wagner Electric Corporation. The national section chairmen will be appointed by President-elect Davidson after July.

Wisconsin Meeting in August

THE Railway Section of the Wisconsin Utilities Association will hold its annual summer meeting on Aug. 13 and 14 in the new Hotel Wausau at Wausau, Wis. The convention will begin at noon on Thursday with a "Get-Acquainted Luncheon" at the carhouse of the Wisconsin Valley Electric Company. There will be songs and rollcall stunts. The general topic for the afternoon is "Shop Practice." A movie reel on the manufacture of cars will be a special feature.

An informal dinner followed by dancing will be held on Thursday evening at the Wisconsin Valley Electric Company Park at Rothschild, overlooking the Wisconsin River.

Several subjects of interest will be presented and discussed on Friday morning in the meeting room of the Hotel Wausau. A special luncheon for men and women will be served at the hotel at 1 o'clock. At 2:15 a mountain climb will be conducted up Rib Mountain, the highest elevation in Wisconsin. Saturday will be devoted to fishing, golf, and sightseeing trips.

Public Utility Storekeeping*

By K. C. CAMPBELL
General Storekeeper Detroit Edison Company

PROVIDING materials and supplies for the various departments requiring them is a storekeeper's first and most obvious duty. He is expected to meet any demands within reason on the one hand and not allow his stock to reach an unreasonable figure on the other hand, which may cause him to be criticised by the financial executive of the company. It should be realized that in the public utility line it is essential that the stores department be so organized that sudden demands for material may be met. Company policy may cause a complete rearrangement of plans without previous notice and the stores department, together with the purchasing department, must meet this condition without wasting time questioning why more notice was not given.

From the purchasing agent's viewpoint there is a tendency, well repressed perhaps, but existing nevertheless, to make a good showing by purchasing occasionally, for the sake of a bargain, material which either may not be needed at the time or is not needed in such large quantities. To buy advantageously is good purchasing, but to have on hand an excessive stock is poor storekeeping. To keep these two conditions in balance is good management on the part of everybody concerned. In my mind if both the purchasing agent and the storekeeper are men of the right caliber there will be no difference of opinion in such matters if each proposition is weighed strictly on its merits from a broad company standpoint.

One thing which I would like to emphasize is the advisability of centralizing all stores under one head. Storekeeping is a line of work by itself and to attempt to consider it as a side line is a mistake. If various departments are allowed to procure and keep their own separate stocks the result will be costly for the company. Not only will the turnover of the aggregate stocks be poor and the investment high but material will become obsolete and useless. It is much better by far to intrust all matters connected with stores to one man and allow him to develop a suitable organization.

In public utility companies most of the departments have their duties pretty well defined and the executives can easily gage whether they are performing such duties satisfactorily. In many cases, however, a storekeeper will operate for some time on what he considers a satisfactory basis and suddenly be called to task by the management for having what it considers too high a stock and a poor turnover.

This state of affairs shows a lack of understanding between the storekeeper and the executives on matters about which there should be no element of doubt. The executives should declare themselves by stating precisely what they expect in regard to turnover and money invested. The storekeeper should know exactly what his limits are and should be able at any time to know from his own records and reports whether he is conforming to standards set by the executives.

This standard should be a stock budget, one simple form of which is a budget of stock limits. Through this, executive approval can be set on a certain running investment in stock and they can control it closely by requiring all additions to be submitted for approval. The executives can do their part by advising the stores department as soon as new projects are decided upon and when any changes in work in progress are made.

A stock budget is particularly valuable in the case of spare parts, as it can be seen that the ordinary plan of replenishing stock according to demand and turnover cannot be applied in this case. Every public utility company should make a careful study of the question of spare parts and after weighing the relative importance of the various kinds of apparatus and its liability of failure it should invest in spare parts accordingly. It should not be necessary to emphasize that the storekeeper should co-operate with the company engineers by having this stock in the right place and ready for instant use in case of emergency and also by seeing that it is promptly replaced.

DUTIES OF CONTROL GROUP

One branch of the work in our own company may be of interest to you. This is a so-called control group, operating within the stores department, whose duty, as its name indicates, is to control the investment in stock. This group studies the turnover of each and every item, approves the locations at which they are carried and approves all purchases and transfers. All dealings with other departments on stock matters, including keeping in touch with jobs in the field, are carried on by this group. This field work is necessary on the larger projects to make intelligent estimating possible and is of great help in providing material at the right time. The control group makes intensive studies of items or groups of items which become "dead" or on which the turnover has become poor. As a result of these studies appropriate action is taken. By putting this responsibility on a separate group, we have attained more efficiency than by having it scattered. We have not lessened in any way the individual responsibilities of the warehouse foremen and others having to do with the various phases of storekeeping, but on the contrary through this control group we have a more thorough check on them than we did before.

The control group makes up each month for the financial executives of the company a six months' forecast of stock to be received and used and also a forecast of stock balances in the various classes. These estimates are based on the latest and most authentic information which can be obtained from various sources on future company plans as well as work in progress. They are necessarily subject to revision when plans are changed and are of considerable assistance to the executives in providing money and for the store department in providing material. The estimates enable the control group to live within the limits of the stock budget and where necessary furnish the information to back up requests for additions to the stock budget.

It is presumed that all public utilities have a salvage department, even if in some cases it is not known by that name. Salvage work needs co-operation on the part of each department from which the salvage originates, the storekeeper who handles and stores it and the purchasing agent who sells the residue which is not used up again on company work. In the first place the salvage man should have advance notification of when property is to be re-

*Abstract of paper read at the annual meeting of the National Association of Purchasing Agents, Milwaukee, May 25-28, 1925.

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moved from the system. I am not referring to small items, including scrap of all kinds, which are constantly coming in and which are handled through standard departmental routine, but to the items of machinery and equipment which need special action.

There should be a salvage man in the purchasing or stores organization whose prime duty it is to handle salvage from the time it is to be removed from the system until it is ready to be sold by the purchasing agent. He should act as a go-between for all departments concerned and should have available at call the services of the experts in all departments who are qualified to decide on such points as possible further use of equipment, etc.

Standardization of stock is a subject which has attracted a good deal of interest among the storekeepers and purchasing agents of our industry. Several large companies, including ourselves, have gone into this matter very thoroughly and have made up stock catalogs for distribution among the various departments. The stock catalog is revised as often as necessary, and by following it both the purchasing agent and the storekeeper may be sure that no items of stock are being purchased unless they have been properly approved as being standard. The storekeeper may also guard against accepting into his stock any nonstandard items removed from the system.

National Motor Bus Association Organized in Chicago

DELEGATES representing state associations or motor bus interests in 21 states scattered throughout the country formed a national motor bus association at a meeting held in Chicago on June 16 and 17. Approximately 100 bus operators and others interested in the industry attended this organization meeting. Delegates representing state associations in Massachusetts, Virginia, Ohio, Michigan, California, Washington, Kentucky, Oklahoma, Idaho, North Carolina and New York, together with operators from many other states and manufacturers' representatives, laid the groundwork for a national association.

This meeting is the outcome of a preliminary conference of bus men from ten states, held in Washington, D. C., last month. At that time an organization committee was appointed to formulate preliminary plans. This committee recommended the organization of a national motor bus association under the control of a board of directors and advocated affiliation with the American Automobile Association upon certain conditions laid down in a set of resolutions.

Ernest N. Smith, manager American Automobile Association, addressed the assembled bus men, and outlined briefly the plan of the A. A. A. for broadening its activities by setting up both a motor bus and truck division. He objected to the terms of the resolution prepared by the special organization committee. Action on the committee report had been postponed pending Mr. Smith's arrival. After he had spoken the bus men voted to proceed with the organization of a national association along the lines proposed, but to leave the details of negotiations for affiliation with the A. A. A. to their new board of directors. Thus the new organization was definitely formed, and although it will endeavor to work out an arrangement for affiliation, it was the sense of the meeting that the bus men would proceed to perfect their own organization, even if an affiliation with the A. A. A. did not prove possible.

A constitution was prepared for the new association, and officers were elected for the ensuing year. The plan of organization is built around the state associations. Each existing state organization is to be invited to join the new national body, and the bus men in states which do not have state associations will be urged to organize and become members of the new national association. Membership will be on the basis of the number of buses operated. The dues are to be fixed later by the board of directors.

The various states in the country are grouped into zones, dividing the country up into seven such districts. One representative from each district is to sit on the executive committee, so that representation will be given to local interests in various parts of the country.

Officers and members of the executive committee elected for the ensuing year were as follows: President, R. W. Sanborn, Cleveland, Ohio; vice-president, William T. Crawford, Portland, Ore.; treasurer, R. L. May, Washington, D. C.; executive committee, District 1, R. M. Sparks, Boston, Mass.; District 2, Dr. McMains, Pennsylvania; District 3, S. A. Markel, Richmond, Va.; District 4, G. P. McCallum, Detroit, Mich.; District 6, Ward Faulkner, Muskogee, Okla.; District 7, Thomas Morgan, Oakland, Cal. The election of a director for District 5 was left with the remainder of the new board.

Legislative resolutions adopted by the meeting were as follows:

Resolved, That Congress should enact legislation giving the Interstate Commerce Commission the power to grant or refuse certificates of public convenience and necessity to motor carriers engaged in interstate commerce. In view of the fact that the Interstate Commerce Commission is now overburdened with work and because of the fact that states through which such motor vehicle lines operate are primarily interested in such operations, the authority of the Interstate Commerce Commission should be limited to the granting or refusal of certificates.

Certificates should be granted as a matter of form in all cases in which the application for a certificate is accompanied by certificates from the state public utilities commissions of the various states through which the motor vehicle line is to operate, certifying that such lines will serve the public convenience and necessity. (The term state public utilities commission comprehends state authorities regulating public utilities regardless of by what name called. In states where there is no public utility regulation of motor vehicle common carriers the state highway commissioner may issue such certificate.)

In cases where such certificates from state public utilities commissions cannot be obtained by the applicant the Interstate Commerce Commission shall grant a hearing on the application for a certificate in order to determine whether such operation is a matter of public convenience and necessity. In determining that fact the commission shall take into consideration existing motor transportation facilities. In all other questions involving certificates the Interstate Commerce Commission shall act as an arbiter in determining differences of opinion between the public utilities of the state through which such lines operate. All other regulation of operation of interstate motor vehicle common carriers shall be exercised by the state public utilities commissions of the states in which the operation is carried on.

Resolved, That a respectful request be made to the Honorable Secretary of the Treasury to include in his tax reduction recommendations to the 69th Congress the abolishment of all federal motor vehicle excise taxes.

Resolved, further, That a like request be made to the proper committee in the House of Representatives and the Senate of the United States Congress.

Resolved, further, That every state motor bus association be urged to take similar action and solicit every individual bus operator to interest himself in an effort to abolish this unnecessary burden by a direct appeal to the Congressmen from his district and the Senators from his state.

In view of the transcendent importance of the subject of interstate regulations, your committee on resolutions respectfully recommends that a special committee of three be appointed to examine the various legal questions involved and to represent this association in an effort to harmonize and compromise any differences that may arise between organizations interested in interstate regulations and to confer with the National Association of Public Utility and Road Commissioners, the Interstate Commerce Commission, the Bureau of Good Roads, etc., and from time to time to report progress and make recommendations to the executive committee of this association.

Engineering Education Under Investigation

ELECTRIC railway managers and many others in their organizations are vitally concerned with the results of technical education. Much important material was presented at the 33d annual convention of the Society for the Promotion of Engineering Education held at Union College, Schenectady, N. Y., June 16 to 20, 1925. Outstanding in importance was the preliminary report of the board of investigation and co-ordination of the society, whose work to the extent of $108,000 expenditure is being financed by the Carnegie Corporation. The board has already found, from an extensive canvass, that entering students are not well prepared for technical training, particularly in mathematics and English; that more than 60 per cent drop out before graduation, and that there is need for college training in the principles of economics and the knowledge of business procedure. With all of these educational difficulties the college faculties are trying to cope.

Turning from what may be termed the negative to the positive side, there was a general agreement that the function of the technical college is to give training in fundamentals of mathematics, science, the humanities and engineering. As a large part of the graduates eventually occupy administrative positions they also need training in human relations.

F. C. Pratt, vice-president General Electric Company, explained what his organization is doing to adapt technical graduates to the electrical industry. The program covers all grades of talent and of late special attention has been given to intensive training of a few scrupulously selected men for positions of leadership. The company is also co-operating with Union College and Massachusetts Institute of Technology to bring education and the electrical industry into closer touch.

At the conclusion of the meeting Dean G. B. Pegram, Columbia University, was elected president. Dean F. L. Bishop, University of Pittsburgh, was re-elected secretary.

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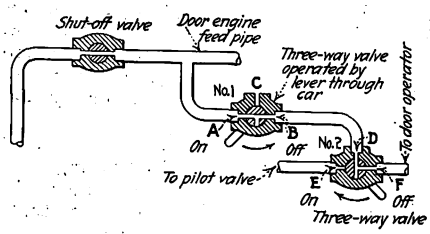
Maintenance of Equipment

Operating Rear Door from Any Point in Car

WHERE cars with door engines are used for either one or two-man operation and where safety automatic brake equipment is used it is desirable to control the rear door from different points in the car. For one-man operation both front and rear doors should be controlled by the operator from the front vestibule. With two-man operation, the front door should be controlled by the motorman, but the rear door should be under the control of the conductor. Where fares are collected in the car, it is necessary for the conductor to leave his station on the rear platform, and in such cases it is sometimes convenient to arrange so that the rear door can be operated from other points in the car than the conductor's station at the rear.

To provide for these conditions, the New York State Railways has provided valves in the piping for the rear door engine, as indicated in the accompanying illustration. This arrangement was devised by H. S. Sweet, engineer of equipment. Refering to the accompanying diagram, where one-man operation is used, the valve No. 2 is placed in its "on" position. This connects the pipe from the pilot valve to the door engine, which is designated on the diagram as *E* and *F*. The pipe *D*, which is used for two-man operation, is also closed off.

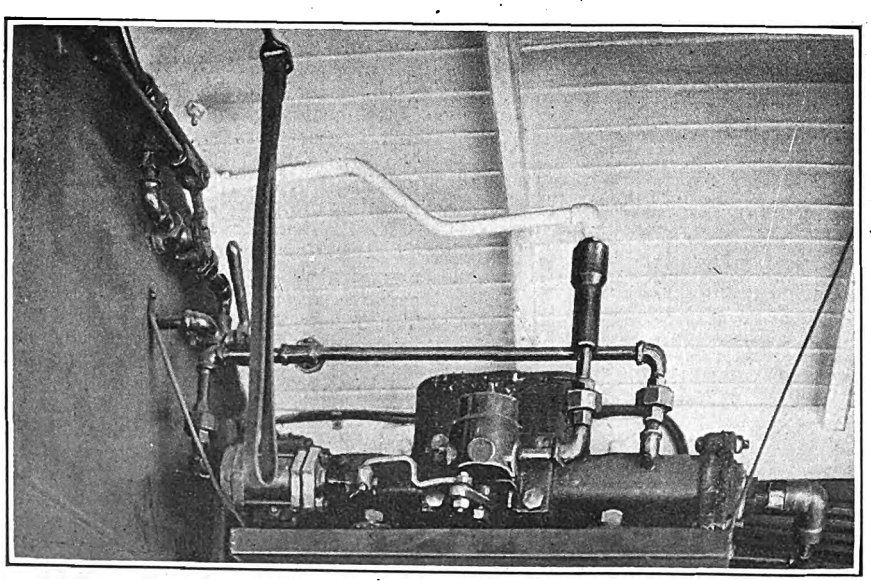
With two-man operation valve No. 2 is placed in the "off" position. This connects pipes *D* and *F* and closes



Piping Diagram for Rear Door Engines on Cars Operated by One or Two Men

pipe *E*, thereby allowing the rear door engine to be controlled by valve No. 1. This latter is a three-way valve, connected to a lever-operated rod which runs through the car and which was previously used for operation of the fare register. This valve No. 1 can thus be operated from any point in the car body, and by moving it to the "on" position the pipes *A* and *B* are connected, which connect the door engine feed pipe directly to the door-operating pipe. By moving valve No. 1 to the "off" position, pipe *B* and *C* are connected, so as to exhaust air from the door engine and close off pipe *A* from the feed pipe.

A shut-off valve is also installed in the door engine feed pipe and the emergency pipe is extended to the rear vestibule. In case of emergency, all that is necessary for the conductor to do is to open the shut-off valve, which will allow air to exhaust from the emergency pipe and throw the brakes into emergency.



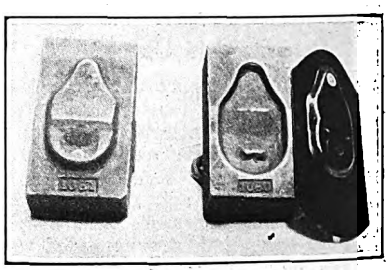
Valves and Piping to Door Engine Provide for Operation of the Rear Door from Any Point in the Car Body

Punch and Die for Forming Journal Box Covers

BY T. E. WOOD

Master Mechanic Omaha & Council Bluffs Street Railway

JOURNAL box covers for practically all types of trucks used in Omaha are punched from sheet steel with the die equipment shown in the accompanying illustration. Both the die and punch are made of cast iron and are used in a large blacksmith's



Journal Box Covers in Omaha Are Formed Quickly in This Die

punch and shear. Covers for boxes of various sizes are all formed with the same die, and are then trimmed to proper size and shape on a serpentine shear. Thus the pieces may be run through the press in comparatively large lots and trimmed for various size boxes as required.

Engine Raised Auto Tower

HORSE-DRAWN tower wagons have been entirely replaced by motorized units for line construction and repair work of the Market Street Railway, San Francisco, Cal. These motor-driven towers have almost revolutionized the work of emergency line repairs on the system.

When the plan was made for changing to auto towers, two novel features were adopted. The tower was made of three stages instead of two, and was raised and lowered by

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the auto engine. The first feature allowed the platform to be raised higher and, when telescoped down, the platform was lower than on the two-stage tower, thus lowering the center of gravity of the whole vehicle for safety, while operating at high speed. It also dropped the tower down so low that the clearance over the top of the vehicle was increased.

The second and most important novelty was the arrangement for raising and lowering the tower from the auto engine. This was accomplished very simply by the use of the ordinary hoist used to lift the front end of the dump body on a dump-body truck. This had, up to that time, never been attempted on a tower.

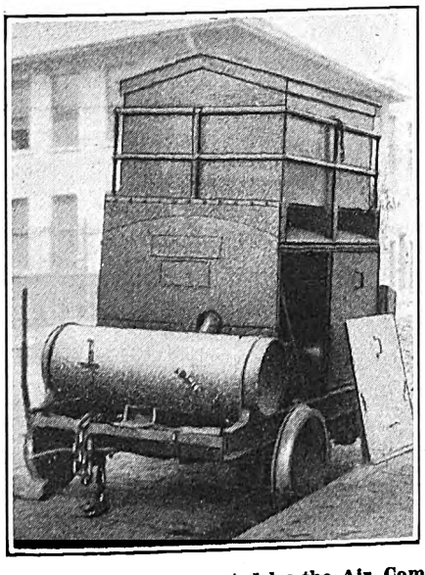
Formerly, when sent to a piece of repair work, the tower wagon stopped at the side of the street. The linemen laboriously raised the tower by the hand cranks, then they climbed to the platform, the driver drove out under the trolley wire, and the work was begun. With the motor-raised tower, the men are on top as the auto tower approaches the job. Before the auto reaches the scene of the work, the tower is raised by the chauffeur touching a lever at his side. When the location of the work is reached, the auto stops directly under it and the men instantly go to work.

Similarly, on leaving, the linemen formerly had to descend from the platform and cautiously lower the tower before the tower wagon could start away. Now the linemen remain on top and the chauffeur drops the tower at the same time as he starts away along the street. Time is saved at every turn, as well as labor, and the efficiency of the whole unit is increased accordingly.

Maintenance Practices on the Pittsburgh Railways

Tool Box Added to Compressor Outfit

RELATIVE efficiency of track maintenance work on the different divisions of its property is indicated to the Pittsburgh Railways by the number of car derailments, which serves as a criterion. Each division, therefore, pays particular attention to see that its track remains in good operating condition. Pneumatic tools are frequently needed in this work. The company has provided a number of Ingersoll-Rand air compressor outfits of the type shown in the accompanying illustration. These are mounted on flanged wheels and are moved over the rails from place to place by work cars. After arriving on the job, they are lifted from the rails and placed at the side of the street in some convenient location. To facilitate the transportation of the pavement breakers and tampers attached to the compressor, the company has constructed wooden boxes on top of the cars. All tools used in connection with the air compressors are carried in these boxes.

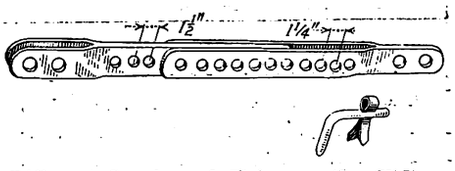


Pneumatic Tools Operated by the Air Compressor Are Carried in the Wooden Box

Pin-Type Slack Adjusters Used in Pittsburgh

INSTEAD of the turnbuckle-type slack adjuster formerly used on the Pittsburgh Railways a pin type made in the company's Homewood shop is now standard. These consist of four parts, two sliding members, a round steel pin and a cotter pin. The sliding parts are punched with equally spaced round holes. On the outside member these are at 1¼-in. centers while on the inside member the spacing is 1½ in. The pin fits these holes. With this spacing arrangement it is always possible to find a position where the pin can be inserted.

The pins are heated in a small oil rivet heater, punched and bent with a die in a pneumatic riveter. Copper for the cotter pins comes in ribbons

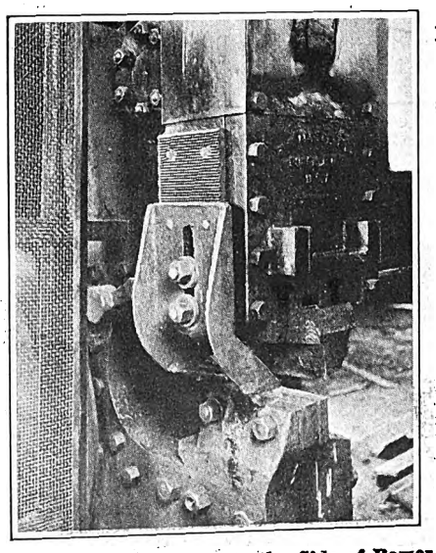


Different Spacing of Holes on the Sliding Members of This Slack Adjuster Facilitates Insertion of This Pin

⅞ in. thick. This is cut into 8-in. lengths by metal shears, and then bent into proper shape by two movements of the pneumatic riveter.

Guard Protects Workman Using Metal Shears

WHEN cutting long metal rods or bars in a power shears it was found in the Homewood shops of the Pittsburgh Railways that there was a dangerous tendency for the end of the piece to fly upward when pressure was applied at the center. To prevent this a guard was arranged as shown in the accompanying illustration. A short length of 12-in. channel was bent to an angle of approximately 120 deg. in the bulldozing machine. Then a serrated piece of metal was fastened to the side of the shears and a similar piece riveted to the back of the channel. Bolts were installed to hold the channel firmly in place. Its position is regulated according to the thickness of the material being cut. The presence of this heavy metal piece alongside the shears has been successful in preventing an upward movement of the pieces being cut.



Channel Iron Fastened to the Side of Power Shears Prevents Upward Movement of Pieces Being Cut

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New Equipment Available

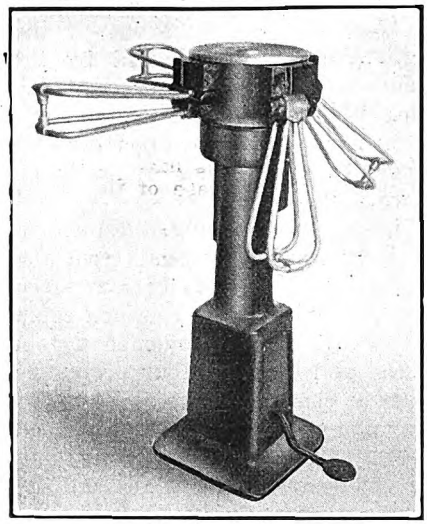
Seamless Metal Hose

FLEXIBLE seamless metal hose, made by corrugating either seamless bronze or seamless steel tube, has been developed by the engineers of Charles Cory & Sons, Inc., New York, N. Y. Methods have also been worked out for attaching fittings of standard design and thread to this flexible hose by welding. The manufacturers claim an increased life for this type of hose over ordinary types and state that it can be used not only in the entire field where ordinary hose is now used, but also for pressures up to 10,000 lb. and temperatures as high as 1,000 deg. F.

Folding Arm Turnstile

A TYPE of turnstile with arms that fold down on one side as they are rotated has just been brought out by the Folding Arm Turnstile Company, J. H. Denton, sales agent, New York City. This type of turnstile is intended particularly for use on electric cars and at locations where space for the usual type is not available.

The new design has a cast-iron base mounting, the lower part of which is arranged for installing coils or interlocking mechanism such as is used with some prepayment systems. A rotating head with four arms made of aluminum tubing fits into the top of the pedestal, and on top of this a change tray is provided for convenience of the operator. A Veeder cyclometer with dial visible through a slot in the change tray records each quarter revolution.



The Arms of the Turnstile Fold Down on the Side Not Used for Passage

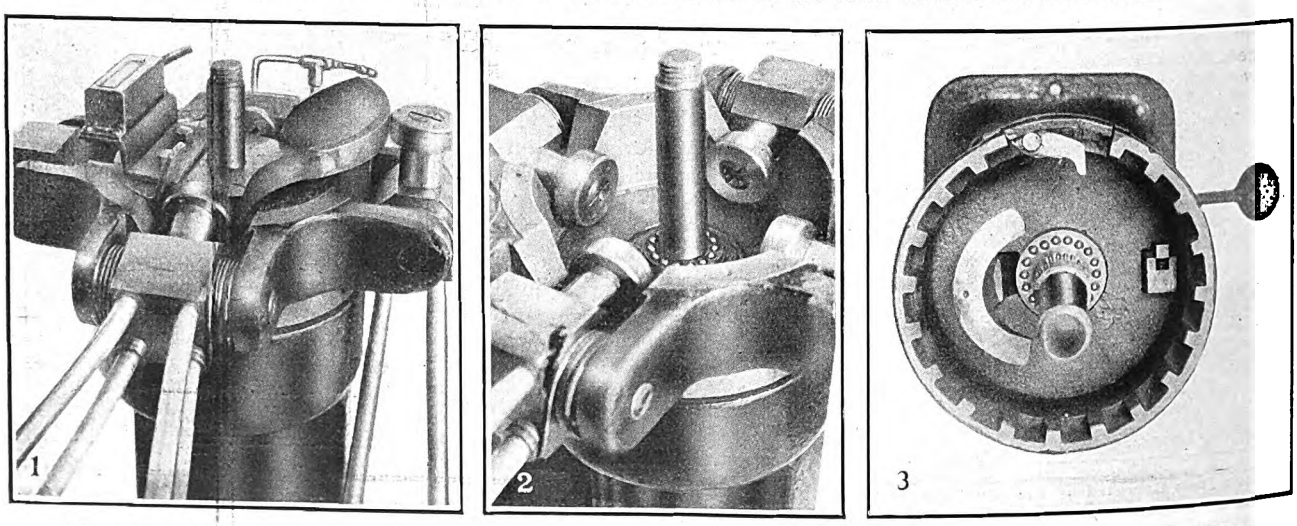
The base is 13 in. square at the bottom and tapers to 7½ in. square at the top. The round part of the base is 5 in. in diameter. With arms down, the outside radius of the revolving head is 7 in. and the radius to the end of the arms when up is 19 in. The height of the turnstile from floor to top of change tray is 3 ft. 3 in. The turnstile is intended for rotation in one direction only, but the direction may be changed by reversing the ratchet pawl. A positive stop is provided at each quarter revolution and release for the ensuing rotation is obtained by depressing a pedal. The location of the pedal in the base can be changed to suit varying conditions.

The rods which form the arms of the turnstile fit into steel blocks. These have an extension in the rear with rollers and the up-and-down motion of the arms is accomplished by these rollers sliding over stationary cams. Springs are provided on either side of each steel supporting block in order to provide for quick raising of the arms. The rotating head is provided with ball bearings at both top and bottom. These are of standard construction and can be removed as a unit. The operating mechanism lifts out from the top, so that inspection and repairs can be made quickly. The weight of the folding arm turnstile complete is about 185 lb.

Relay Calibrated Without Removing Cover

CONSTRUCTION for calibration without removing the cover by means of a knob projecting through the glass window at the upper part of the case is a feature of a new power relay brought out by the General Electric Company. This relay is for use in limiting the power on distribution lines to a predetermined quantity. It has a large range of calibration, running from zero to 1,000 watts, secondary.

This relay is manufactured in three forms; the "IG-102," an "over power" and "under power" device with contacts for controlling either alternating or direct current, and two "over power" devices, one for alternating and the other for direct current, known as the IG-103 and IG-104, respectively. By rotating the knob at the window the relay may be adjusted for operation at any deviation from the desired load. A graduated dial, mounted beneath a fixed needle, rotates with the calibrating knob, giving visible indication of the load setting.



No. 1. Cast Steel Cams Guide the Rollers on the Inside End of the Turnstile Arm and Produce the Up-and-Down Motion. Nos. 2 and 3. The Revolving Head Has Ball Bearings on Both Sides

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The News of the Industry

City Will Buy Road

Phoenix Railway to Be Sold at Junk Value—Commission Claims Contract Is Illegal

Complications continue to pile up at Phoenix, Ariz. The city, through its commission, in a resolution unanimously adopted by its members, authorized the purchase of the equipment of the Phoenix Railway. As opposed to this the State Corporation Commission holds the proposed purchase to be illegal. If the city has its way it will purchase all the equipment and property of the company at their salvage value, to be determined by appraisers on or before Sept. 15 in anticipation of threatened suspension of service on Oct. 20. It is said that the city does not contemplate the operation of a railway but proposes to purchase the equipment at its junk value with the intention of interesting some concern in rehabilitating the system. There will be two appraisers, one representing the city and the other the company. In the case of a disagreement, a third appraiser will aid in determining the value.

Mayor Whitney, in a statement made following the session of the commissioners, said the fact that the City Commission had decided to purchase the equipment as junk was no indication that he, personally, favored municipal ownership of the Phoenix Street Railway. He said: "I am opposed to the city operating this street railway, temporarily or permanently, under any conditions whatsoever." He said if no arrangements were made to rehabilitate the system by the time that the owner, Mr. Sherman, abandoned his franchise, the city would then feel compelled to consider applications for bus franchises. The City Attorney says the city will be within its rights in purchasing the line because the franchise was granted before provisions of the charter quoted by the state commission were framed.

The Corporation Commission disapproves the agreement on the ground that it is illegal, not having been presented to the voters of the city. In accordance with the city charter, the commission pointed out, provision was made that the city could not enter into the purchase of a public utility without first having submitted the proposition to the people. The commission stated that it was not concerned with the operation of the public utility by the city, but that it did feel it should determine whether the action proposed was of a proper legal foundation.

The commission also called attention to a bonded indebtedness of $150,000 against the railway, which is a first lien against the property and which will continue as such unless some provision is made in the contract for cancellation. The commission claims that the contract leaves room for doubt as to the city's obligations and responsibilities. It further objected on the ground that no definite price was fixed in the contract for the purchase of the railway property.

Saginaw Transit Seeks Fare Boost

Petitions have been placed in circulation by representatives of the Saginaw Transit Company, Saginaw, Mich., furnishing street car and bus transportation, asking for a revision of the franchise making three-for-a-quarter ticket fares possible. The present franchise allows four tickets for 25 cents. The cash fare is 10 cents.

The company at Saginaw resumed operations in November, 1923, after a two-year period of suspension, but it did not furnish 100 per cent service until Jan. 1, 1924. The franchise terms of the new car-bus ordinance, which was approved by the voters on June 25, 1923, were reviewed in the ELECTRIC RAILWAY JOURNAL issue of July 14, 1923, page 70, and April 5, 1924.

Detroit's Mayor for Open Railway Meetings

Meetings of the Board of Street Railway Commissioners at Detroit, Mich., are to be open to the public by direction of Mayor Smith. Heretofore the policy has been to close the meetings of the commission to all except those immediately concerned, but the Mayor has requested that all future meetings be held at a fixed time and place and be open to the public.

In a letter to the commission the Mayor said:

> I desire respectfully to recommend that meetings of the Board of Street Railway Commissioners be fixed for a definite time and that a place of meeting be designated, which shall be open to the public.
>
> It is my belief the business of the Department of Street Railways should be wholly public. One of the chief factors in the decision of the people of Detroit to adopt municipal ownership as our settled policy was the belief that secrecy was not consonant with the proper operation of a public utility for the public's benefit. I believe the public is entitled to know every fact regarding the operation of its railway. I believe the public has a right to complete information regarding public business. I therefore make this recommendation.

Mail Pay Case Decided

I.C.C. Increases Rate on Independent Cars, but Keeps Pouch Service at Old Figure—Terms of Order Reviewed—Case Argued Early Last Year—Industry's Contentions Summarized

THE Interstate Commerce Commission decided the electric railway mail pay case on June 2. Under the decision there is no increase in the pouch rate, but there is a considerable increase in the independent car service rate and apartment rate. Thus, the independent car rate, for a car 36 ft. long, is 50 cents, whereas at the old rate it would have been 36 cents, and the department pays for an authorized round trip. There is also a notable increase in the apartment rate.

The post office department made a very technical analysis of costs, but made no allowance for load factor, excess mileage or excess space taken by the unit number of pouches and reached the figure of 1.87 cents per car foot-mile. After reviewing the argument on the closed pouch and other service, the commission issued an order regarding new rates, as follows:

> 1. That the present rates of pay for the transportation by urban and interurban electric lines of mail on passenger cars, on baggage or express cars, and in baggage and express compartments in passenger cars, are fair and reasonable.
>
> 2. That the fair and reasonable rate for independent cars devoted to the transportation of the mails, on which railroad employees handle the mails, is 50 cents per car-mile of authorized travel of cars 36 ft. in length, inside measurement. Where the railroad company is unable to furnish cars of the length authorized but furnishes cars of lesser length which are accepted by the department to be sufficient for the service, payment shall be made only for the actual space furnished, the compensation to be not exceeding a prorate of that provided for a 36-ft. car. Where cars exceeding 36 ft. in length, inside measurement, are authorized and used, the compensation shall be not exceeding a prorate of that provided for a 36-ft. car. In computing the car-miles of independent cars the space in both directions of an authorized round trip car run shall be regarded as the space to be computed unless the car or any part thereof is used by the company in the return movement.
>
> 3. That the fair and reasonable rate for railway postoffice cars and railway post-office apartments in cars, in which postal employees handle the mails, is 2 cents per linear foot, or fraction thereof, per mile of authorized travel in cars or apartments in cars 20 ft. or less in length, inside measurement, and in cars or apartments in cars more than 20 ft. in length, inside measurement, 2 cents per linear foot per mile of authorized travel for the first 20 ft. and 0.875 cent per linear foot per mile of authorized travel per each additional foot or fraction thereof. In computing the car-miles of full and apartment railway post-office cars, the maximum space authorized in either direction of a round-trip car run shall be regarded as the space to be computed in both directions.

A summary of the brief of the American Electric Railway Association case was published on page 664 of the issue of this paper for April 26, 1924. Briefly, it asks for a basic rate of 7 cents (for ten pouches or less) instead of the existing basic rate of 4 cents. It based its request partly on the claim that the pouches as piled took more room on the car than allowed by the department and that this represented, therefore, a larger proportion of the transportation service rendered per car-foot-mile than allowed by the depart-

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ment. The association also showed that the average load factor in passenger cars, i. e., the relation between passenger miles and car seat miles (plus an allowance for the revenue space on the platforms) is only 42 per cent, so that this factor should be considered in calculations of the cost per foot-mile, as should also the mileage from terminal to carhouse. With these allowances and one for handling, the rate of 7 cents was obtained as a fair basis, instead of the 4 cents at present paid.

The case was argued early last year. W. H. Maltbie, Baltimore, represented the American Electric Railway Association and certain interurban and urban electric railways, and Frank Karr and C. W. Cornell represented the Pacific Electric Railway and two other electric railways on the Pacific Coast. Joseph Stewart, special assistant to the Attorney-General, represented the Postmaster-General. The last previous mail rate schedule of the Interstate Commerce Commission went into effect Dec. 6, 1920, and the claim of the electric railways was that the rates were inadequate to meet operating expenses and an 8 per cent return on the investment, whereas the Post Office Department recommended a lower rate than at present for the pouch service and the r.p.o. apartment service. In the year ended June 30, 1923, the Post Office Department paid out $569,195 for electric railway mail service, divided as follows: Closed pouch passenger service, $320,879; closed pouch baggage service, $101,524; r.p.o. cars, $46,320; r.p.o. apartment service, $92,065; independent cars and apartment service, $8,407.

Seeks to Drop Litigation Over Eight-Cent Fare in Philadelphia

A resolution was recently offered at a meeting of the transit commission of Philadelphia, Pa., in the office of the Mayor, requesting the City Council to instruct the City Solicitor to discontinue the pending action of the city before the commission for a reduction of the temporary fare granted to the Philadelphia Rapid Transit Company. The resolution stated that the company, through the maintenance of its present earnings under the 8-cent fare, would be enabled to build up a reserve that would provide for the various extensions and improvements of the transit system which are contemplated as part of the city-company program.

The meeting in the Mayor's office was originally called to consider a proposal to take over the Frankford, Tacony & Holmesburg Street Railway, which was sold on June 19 at auction by receivers for $350,000. Both proposals were submitted to a sub-committee for consideration and recommendation. Thomas E. Mitten, chairman of the executive committee of the P. R. T., attended the meeting and, at the invitation of the Mayor, told the residents of the northeastern section of the city and the members of the commission present the program which the city and company, co-operating, could carry out if the present P. R. T. earnings were maintained.

Utility Building Dedicated at Pittsburgh

Investing a building with personality might aptly be termed the plan of procedure followed by the Philadelphia Company and affiliated corporations of Pittsburgh in throwing open for public inspection and use its new office building. Through the use of the slogan "The House of Service," the company has given the building an individuality sufficient to make it stand out prominently in the city. In the structure are to be found the headquarters of the Pittsburgh Railways, Duquesne Light Company, Equitable Gas Company,

Pittsburgh's "House of Service"

Allegheny County Steam Heating Company and various subsidiary corporations.

Promptly at noon President Arthur W. Thompson, before the massed public and employees, dedicated a table consecrating the building to public service.

As a fitting climax to the opening ceremonies, a banquet was held in the roof garden of the William Penn Hotel. The guests included prominent bankers, business and professional men, public officials, representatives of public utilities from nearby cities and states, service club members, newspaper men and others of the Pittsburgh district. President Thompson presided at the dinner. Although the main banquet facilities were inadequate to accommodate all of the employees, the proceedings and speeches were made available by broadcasting the event through KDKA, the Westinghouse station.

As a fitting climax to more than 40 years of public service, the celebration incident to the dedication of the building brought prominently before the residents of the community the fact that the utilities have been performing a public service for the past forty years, with an expressed resolve to be of even greater service in the years to come.

Vote on Bus-Street Car at Lincoln

The Council of Lincoln, Ill., has passed the solution of its troublesome municipally owned railway to the electorate. Mayor Howard Engle openly termed it "passing the buck to the people." Guy LaBaw, manager of the municipal railway, went to the Council with a petition for a bus line, but after discussion it was decided to let the people vote on the question of whether they want buses or the railway. Early suspension of the railway was predicted by Mr. LaBaw as a result of the refusal of the Council to authorize him to make needed expenditures.

No Definite Progress on Buffalo Program

Scrapping of seven railway lines in Buffalo and the introduction of double-deck buses on five new lines are proposed by the International Railway as part of the city-company plan of operation now being discussed at conferences at which were present representatives of the traction company, Mitten Management, Inc., Philadelphia; members of the Buffalo City Council, the Chamber of Commerce and publishers of Buffalo daily newspapers.

Herbert G. Tulley, president of the railway, says adoption of the plan would tend to better transportation in widely separated sections of the city. Many of the car lines which the company would abandon are now operated with a one-man crew as an economy measure while city-company negotiations are in progress. Mr. Tulley said traffic congestion in many parts of the city and the increased use of the automobile were delaying the operation of street cars and speeding up the time when buses must be used for quick transportation on lines where passenger traffic is not unusually heavy during rush hours.

The application of the International Bus Corporation, a subsidiary of the railway, for permission to reroute the Delaware Avenue-Kenmore bus line was denied pending consideration of the new bus proposals in their entirety.

Arbitration at Boston Deadlocked

Up to June 25 there has been no change in the arbitration situation either on the Boston Elevated Railway or the Eastern Massachusetts Street Railway, Boston, Mass. The lawyers for both cases have daily sessions over the question of who shall serve as the third arbitrator in each case. Many men have been proposed and rejected for the office of neutral arbitrator, but these names are not to be made public.

James H. Vahey will represent the carmen in both cases, Roland W. Boyden will represent the Elevated in its case and Fred Cummings will represent the Eastern Massachusetts in its case. Practically every day Mr. Vahey calls first on Mr. Boyden to discuss with him the third arbitrator for the Elevated, then he calls on Mr. Cummings relative to a third man for the Eastern Massachusetts. They are practically deadlocked. The Boston Elevated employees have indicated that they will make some new proposition to the trustees, presumably relative to the method of arbitration, but they have not yet communicated with the trustees about it or stated what their proposition will be.

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Kansas Controls the Bus

According to announcements made at Topeka, Kan., on June 20, buses operating in Kansas are subject to state regulations just as strict as those applied to railroads, electric railways and other common carriers. The Public Service Commission announced the rules effective from June 22.

Bus companies will have to file with the commission schedules giving the rates and tariffs to be charged, and no company will be allowed to change either without the consent of the commission; once a bus company gets a permit service cannot be discontinued without the consent of the commission. Licenses will be revoked whenever a line stops service for five days.

Tickets, printed to show points of origin and destination, and fares charged will be required and regular freight schedules will have to be presented to the commission for approval.

The rules also provide that the drivers of all buses carrying passengers must be not less than 21 years old, of good moral character, must be physically fit and must have had at least two years experience as chauffeur.

The commission will check the finances of all companies operating buses within the boundaries of the state. All companies will be required to obtain permission from the commission to issue stocks, bonds or notes, and will be required to submit both quarterly and annual reports of operations and financial condition. The following information must be incorporated in each quarterly report:

Revenue and expenses during the preceding quarter.
General financial statement of assets and liabilities.
A report of the amount involved in, and the nature of all claims pending, if any, and the status of the claim at the time of the report.
Number of passengers and tons of freight carried during the preceding quarter.
Make of each vehicle, with capacity and number of miles operated.
Any additional information that may be called for by the commission at any time.

There are 41 principal rules, each of which is subdivided into additional rules. The rules also make provision for damage insurance based on the size of each coach and the number of passengers carried at capacity load.

The rules were promulgated as a result of legislation passed at the recent session to put buses under the jurisdiction of the commission.

Chancellor Upholds Act of Tennessee Legislature

"I am constrained to dismiss the bill and to hold that the act is valid and the law of the land." In this manner did Chancellor John R. Aust in Chancery Court recently dispose of the case of M. S. Adams against the Nashville Railway & Light Company, in which the complainant had brought suit against enforcement of the law prohibiting the use of one-man cars in any city of Tennessee having more than 30,000 population. The complainant averred that he was a stockholder in the defendant company and that therefore he was materially interested in the matter. He asserted that for the company to comply with the act would cost $150,000 for initial equipment and an annual increase of $75,000 in operating expenses. The answer of the company admitted the allegations of facts contained in the complainant's bill.

Chancellor Aust said that the act was passed by virtue of what the Legislature conceived to be a proper exercise of the police power. The question was not one, therefore, of power, but whether or not a rightfully possessed power had been properly exercised. An appeal was taken to the Supreme Court.

The decision in Nashville is directly opposite to the finding at Knoxville. There Chancellor Brown declared the act unconstitutional and enjoined the Knox County sheriff and Attorney-General from enforcing it, pending the outcome of an appeal. Attorney-General Thompson of Tennessee is a party defendant in the suit brought by the Knoxville Power & Light Company.

Shipment Sent by Electric Railway Meets Emergency

What is believed to be a speed record in delivery of special track materials to the Community Traction Company, Toledo, was made recently in connection with the Summit Street extension track-laying job.

The concrete slab put in a year ago by the contractor when half of the base for the track was laid and half of the pavement base put in was found by mistake to have only 8-in. clearance to the top of rail. This would not accommodate the 6-in. rail and 3-in. tie. Therefore the work was held up.

P. J. O'Neill, railway engineer of the company, telephoned for the special material to a Cleveland concern at 1:32 p.m. on June 10. This order was completed at 4:50 o'clock that same afternoon, shipped by electric railway freight on the Lake Shore Electric Railway to Toledo, arrived at 7 a.m. on Thursday and was in the track by noon of that day.

The local railway men believe this is a real case of co-operation and that it also demonstrates the rapid freight facilities of electric traction which merit the support of all urban railway properties and the manufacturers in the field.

Tune in on WCAP for a Treat!

On Monday, June 29, between 8 and 9.30 p.m. the electric railway industry throughout the country as well as the general public will have an opportunity to judge of the success of a railway in developing musical talent within its ranks. At that time the band, the male chorus, and the ladies' chorus of the United Railways & Electric Company of Baltimore will broadcast a program from Station WCAP, Washington.

These musical organizations have been trained by the United Railways in line with its policy to encourage the family and social spirit among its employees. Each of them has appeared publicly on various occasions, but this is the first time they have all appeared on the same program, and the first time any of them has broadcast from one of the major stations.

The band was organized about seven years ago and was trained by its present director, B. O. Belt, a capable instrumentalist, who is a dispatcher at one of the United's carhouses. Practically all the members of his band are from the transportation department. The band's first active experience was in connection with Liberty Loan sale meetings throughout the city during the war. It has given many public concerts, participated in a number of parades, and was taken to the national Rotary convention by local Rotarians a couple of years ago.

The male chorus is composed principally of men from the transportation departments and the shops. It was trained and is directed by John P. Tingle, secretary to President Emmons. Mr. Tingle is choir director of the Pro-Cathedral of the Protestant Episcopal Diocese of Maryland. He also directs the ladies' chorus, the most recently organized musical body of the United. It is composed of young ladies from the general offices of the company.

In all about 100 vocalists and instrumentalists will go to Washington in special cars to participate in the broadcasting program. A well rounded program has been arranged with something of interest to everybody. In announcing the program the railway company said it would appreciate hearing from any of its friends who listened in.

President Emmons Not a Bit Disconcerted

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Rockford City Traction Again Wins Franchise

Members of the City Council of Rockford, Ill., by a ballot of nine to seven have voted a third franchise to the Rockford City Traction Company. The two previous ones were lost, one in a referendum and the other by a mayoralty veto. As voted by the Council, the franchise prohibits operation of one-man cars, assesses track paving costs against the utility, assesses one-third of the costs of a new State Street bridge over Rock River against the utility, requires the company to lay grooved rails in all new construction, prohibits the utility from taking advantage of any terminable franchise legislation that may be enacted by the Legislature and provides means whereby the city can become owner of the line under certain conditions.

Indications were that Mayor Hallstrom would sign the ordinance, or at least let it become effective without his veto. The railway has 60 days in which to accept or reject. Arthur D. Mackie, special representative, stated that the company could not accept the franchise with its "objectionable" features, but added that he would pass it to the owners without recommendation.

On the other hand, the City Council has definitely shelved proposals of Messrs. Mordaunt and Stedman and the City State Investment Company, sponsors for the Rockford Transportation Company, which advanced a plan intended eventually to develop into municipal ownership.

San Francisco Municipal Railway Outlook

M. M. O'Shaughnessy, city engineer of San Francisco, Cal., says that at the present time there are no surplus funds, either from the sale of bonds or from earnings of the San Francisco Municipal Railway, nor does the present rate of fare show a possibility of surplus funds in the immediate future. Under these circumstances he says the only way to secure Municipal Railway extensions is through the issuance of bonds. According to Mr. O'Shaughnessy, this matter has been frequently discussed, but action has been deferred by the board of supervisors on the grounds of waiting for the outcome of the negotiations for the purchase of the Market Street system.

These and other comments are contained in the report of Mr. O'Shaughnessy to the city for the fiscal year ended June 30, 1924, an illustrated booklet of 112 pages just made public. According to him nothing of a constructive nature has been done the past year toward the acquisition of the properties of the Market Street Railway. A valuation of this property was made by his office during 1921, and all legislation necessary to take over the entire property was provided by a public election held in November, 1923. He says the importance of reaching a definite settlement of this question has been pointed out in several previous instances, but that the dual ownership, with pending acquisition of the private corporation, makes it difficult properly to expand the municipal system.

Negotiations between the city and the Market Street Railway have been in the hands of a special committee, appointed by the Mayor, of Supervisors and other city officials.

Higher Fares Predicted for New Orleans—Loan Studied

R. S. Hecht, chairman of the board of directors of the New Orleans Public Service, Inc., New Orleans, La., recently declared before the railway wage arbitration board that the company could not get along on the reduced carfare it agreed to three years ago if it were forced to increase its payroll. The company is seeking a wage reduction.

Mr. Hecht said the 7-cent carfare had cost the company more than $1,000,000 in three years, this being the difference between the allowable rate of return and the amount that had actually been realized. He said, further, that the company had continued on the reduced rates because of its desire to deal fairly with the public in the hope of later getting the benefit of the extensive improvements now being made.

The New Orleans Public Service has sought authority to issue $5,000,000 in bonds for improvements already made or contemplated. It is stated that the city authorities will, before giving a final answer to the request, order that the company show the Commission Council in detail just what the $5,000,000 is required for. Further, that in case the city does give its approval, it is understood that the money from the bonds be added to the rate base, on which the company is allowed to earn 7½ per cent, only as it is actually expended dollar for dollar in improvements.

Safety Stressed in Montreal

Demonstrations in accident preventions were included as part of the program of the Province of Quebec Safety League in its celebration of Safety Week, June 7-13. At the invitation of the Mayor of Montreal about 500 public-spirited citizens attended an inaugural dinner meeting on the first evening of the week to listen to interesting talks on accident prevention. In addition to advancing the cause of safety during the week the league conducted a $50,000 campaign seeking generous subscriptions for "the life of one near and dear to you." Such a fund, according to the literature printed for distribution during safety week, would cover a two-year budget, would save 25 to 50 lives a year, prevent innumerable serious injuries and save much money in property damages. Subscription forms were prepared, with blanks, to fill in the amount of money to be turned over to the league "as evidence of my interest in the educational service rendered the community by the Province of the Quebec Safety League in its endeavors to prevent accidental fatalities." Arthur Gaboury, formerly of the Montreal Tramways, is general manager of the Province of Quebec Safety League, Montreal.

Minority Rejects Chicago Elevated Wage Proposal

The smooth trend of the wage negotiations in Chicago has been broken by an adverse vote on the scale of the elevated employees. The "L" employees, who always vote on their scale after the Surface Lines union men have signed a new agreement, gave labor leaders no less a shock than transportation men by returning a negative vote on terms similar to those already ratified by the larger union embracing the street cars.

Company officials were in a quandary over the sudden reversal, but were equally surprised to find in the organ of the Amalgamated in Chicago a complete explanation of the vote that amounted almost to an apology.

The labor editor revealed that the vote represented only 27 per cent of the membership of the local and continued to say that the small attendance was due to the general apathy to union agreements that comes with contentment. Most of the men, the editorial said, had taken it for granted that whoever went to the meeting would, as usual, vote for the agreement submitted, as had the Surface Lines unions.

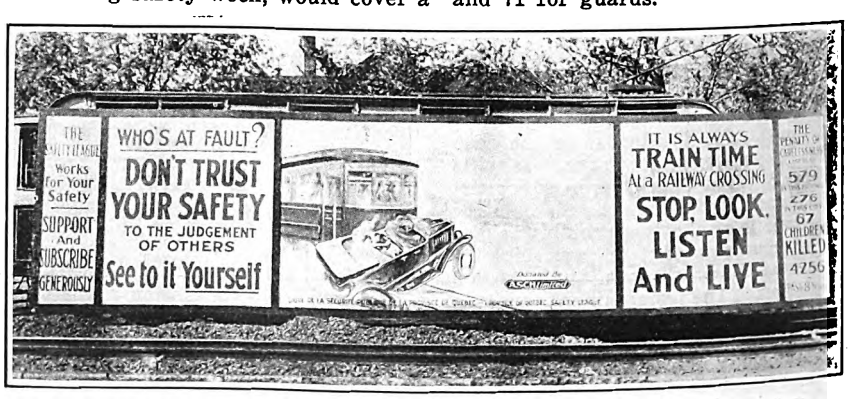
Company and union officials are conferring about the best line of procedure to put the agreement to another vote. Except for minor working conditions, the terms are the same as those existing previously.

B. J. Fallon, general manager of the elevated, conferred with John Bruce, union president, and a committee on June 25. Mr. Fallon made it plain that no increase would be granted.

"There is absolutely no chance," said Mr. Fallon.

"We haven't the money, and there is no money in sight."

The scale is 77 cents for motormen and 71 for guards.



Car at Montreal Carrying Safety Message

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Cincinnati Franchise Advanced to Printing Stage

So far have the conferees advanced toward final agreement as to terms of a new traction franchise for Cincinnati, Ohio, that it has been decided to print the document for submission to the City Council with blank space only for the insertion of two comparatively unimportant items. These are whether tickets shall be sold in strips of six or in strips of six and three and whether the cash fare shall be 10 cents or 9 cents. These questions will have to go back to the directors of the Cincinnati Street Railway, but the sentiment seemed unanimous for tickets in strips of both three and six at the rate of 8⅓ cents and a cash fare of 10 cents.

The new ordinance will contain no provisions regarding buses. The present idea of City Council leaders is that a distinct standing committee on buses shall be created to consider all applications for the reestablishment of bus routes and report back to the Council, as does the present street railroad committee on applications for the establishment of new street railway routes.

It was announced that the board of directors of the street railway consented to a provision fixing the return on capital stock for the first three years of operation under the new franchise at 5 per cent with 6 per cent thereafter. It constitutes a surrender of one-sixth of the dividend for three years, something that was insisted upon by members of the Mayor's traction committee.

Railway Participates in Bridgeport Progress Week

"Progress Week" was held in Bridgeport, Conn., from May 30 to June 6. It brought a large attendance. Some 200 concerns exhibited their products and merchandise. One of the most interesting and extensive exhibits was furnished at the booth of the Connecticut Company. A working model of a power house was shown with overhead traction wires, permanent tracks and passenger and freight cars in continuous operation thereon. Large blueprints were exhibited to give an example of the life-time growth of the company. In 1894 it was seen that the Connecticut Company operated only 46 miles of track compared with 1,042 miles of track today. A model pioneer locomotive, used in Derby and Ansonia in 1888, illustrated the idea of the first attempt to haul freight by electric power. The overhead wire was an exact reproduction of the heavy cables used on all lines. It was manufactured by the Bridgeport Brass Company of Bridgeport.

Motorman Pate Forgot—One Killed, Fourteen Injured

One man was killed, one seriously hurt, a dozen or more passengers were injured, two interurban cars burned and a trestle was destroyed as the result of forgetfulness on the part of Clarence H. Pate, operator of a one-man interurban car on the Prospect or River Road line of the Louisville & Interurban Railroad, a subsidiary of the Louisville Railway, on the evening of May 26. Pate's orders were to await at Harrodscreek siding to let an outbound car pass him. Instead he came on toward Louisville, and on a trestle across Goose Creek, his car met head-on that of William F. Edwards. Vestibules were telescoped to the front rows of seats within the cars. Motorman Edwards was pinned in the wreckage and burned to death in the fire that followed the collision. Fourteen passengers were injured. Motorman Pate suffered a broken collarbone.

As he saw the other car rushing toward him Pate is alleged to have exclaimed: "My God, I forgot." Company officials announced that the accident was due to Motorman Pate's failure to follow instructions.

Both men had been with the company for years.

Strong Case by Dissenting Arbitrator

Although Overruled, Representative of Atlanta Company in Recent Wage Dispute Laid Down Statement of Sound Economic Doctrine—Digest of Opinion

C. M. CANDLER'S dissenting opinion in the recent wage arbitration at Atlanta, Ga., has been the cause of no little comment in Atlanta and elsewhere in the South. His contention was that a living wage for the employee could be met only by a living wage for the employer. Mr. Candler represented the Georgia Railway & Power Company on the board of three to whom the matter was referred for settlement. His associates were Edwin F. Johnson and Luther Still.

As explained recently in the ELECTRIC RAILWAY JOURNAL, Messrs. Johnson and Still granted an increase of 3 cents an hour to motormen and conductors and of 6 per cent to other employees. This made the scale for motormen and conductors 46 cents an hour for the first nine months of service, 51 cents for the next nine months of service and 54 cents thereafter, effective as of May 1, 1925, to continue through Dec. 31, 1925, or as long thereafter as may be mutually agreeable to the company and the association, except that notice in writing may be given at least ten days in advance of a desire on the part of either the association or the company to negotiate a new wage scale after Dec. 31, 1925.

Under an agreement similar to the one under which the board recently acted the same three individuals on March 24, 1924, by a majority vote (Messrs. Johnson and Candler for, with Mr. Still dissenting) fixed a scale of wages to apply during the entire calendar year 1924. Under dates of Dec. 30, 1924, and Jan. 1, 1925, the company and the employees agreed to continue the scale in force into the year 1925, without any definite term, subject to ten days notice. In the meantime the employees made a demand for increases in the 1924 scale, and, the parties failing to reach an agreement by negotiation, on April 13 entered into the agreement. In other words it was only a little more than a year since the scale carrying increases of approximately 7 to 10 per cent was prescribed. Mr. Candler said that the question which logically arose is: Have conditions which entered into the consideration of proper wages in March, 1924, so materially changed in May, 1925, as to require or justify an upward revision of the scale?

The evidence submitted at the hearing was largely confined to this question. It was contended by the employees that the cost of living in Atlanta had increased materially since the last arbitration. Evidence in the form of retail food prices quoted by two retail grocers in Atlanta on a limited number of articles for one day only was submitted in support of this contention. The company submitted estimates as to the cost of living in Atlanta made by the United States Bureau of Labor and also by the National Industrial Conference Board. From all the evidence before the board, Mr. Candler was of the opinion that the cost of living in Atlanta, in so far as it entered into a consideration of wages, had not increased so materially over March, 1924, as to justify the increase in wages awarded by a majority of the board.

Mr. Candler also disagreed with the contention by the employees that traffic conditions in Atlanta had grown so bad that the services of trainmen were performed under greater nervous and mental strain. He said the recent establishment of stops at numerous traffic boulevards, the elimination of jitneys from streets upon which cars are operated and other traffic regulations adopted during the past year would rather tend to render street car operation safer and offset the possible effect of any slight speeding up of schedules in non-congested sections.

During the hearing the probable effect of jitney elimination upon the company's revenues was discussed. In Mr. Candler's opinion the effect for a year or any fair period of operation can only be estimated, not with such certainty as to justify the imposition of a large, definite, additional expense burden upon the company. In conclusion he said:

> It must be borne in mind that a public utility occupies an entirely different position from that of a private industry. If the wage scale of a manufacturer is increased he offsets the increase by a corresponding increase in the selling price of his products. If because of competition or for other economic reasons this cannot be done, he can suspend operations until conditions are improved, or quit business altogether, or remove to some other more favorably located city.
>
> The utility cannot increase its rate; it cannot remove to another city; it must go on at the rates fixed by the public, operate under regulations prescribed by the public, and in the case of the Georgia Railway & Power Company pay wages fixed by arbitration.
>
> I concede that the cost of living has a place in the consideration of a wage scale, but I also contend that the ability of the railway to pay wages must enter into the consideration. A living wage for the employee can only be met by a living wage for the employer.
>
> The company submitted evidence show-

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ing that its railway net earnings were approximately $273,000 less in 1924 than in 1923, and less for the first three months of 1925 than for the same period in 1924, failing by $118,000 to meet interest charges alone. No evidence was introduced to discredit these statements of actual results.

The company contends that the wages now in effect have been and are sufficiently attractive to bring to it many applications for employment, approximately 600 having been made since Jan. 1, 1925, only 80 of which could be accepted as railway trainmen. This fact would indicate that the railway service and wage must be equal to or even more attractive than employment in other lines open to the employees.

The evidence submitted further showed that of 41 street railways in the South, only three pay higher wages than are paid in Atlanta; two pay the same top wage as Atlanta and 35 pay lower wages than Atlanta. It was further shown that the average top wage of these 41 companies is 45.7 cents an hour as compared with 51 cents in Atlanta, in effect at this time, or 54 cents as fixed in this award.

Taking into consideration the entire record of this arbitration, I am of the opinion that conditions in Atlanta affecting railway wages do not require or justify any increase in the existing scale and that the same should be continued in effect through the year 1925.

More Subway Routes Validated in Brooklyn

Borough President Maurice E. Connolly of Queens swung into line for Mayor Hylan's proposed $542,000,000 independent municipal subway on June 19 and the Board of Estimate validated the Queens routes proposed by the Board of Transportation with one slight change and with one proviso by Mr. Connolly. The change was the inclusion in the Board of Transportation's plans of the so-called Steinway loop. The loop will be about half a mile in length and will cost about $3,000,000 additional. Mr. Connolly announced that he would vote for approval of the route, but added that, when it became time to appropriate money for construction, he would insist that the line in Queens Boulevard be built as a covered subway. This will cost $20,000,000 additional.

The action by the board completed the validation of all the routes proposed by the Board of Transportation for Manhattan, the Bronx and Queens. As Richmond has no place directly in the city's proposed subway system, that left only the Brooklyn routes unvalidated. The matter of the Brooklyn routes will be considered on July 1.

Beaver Valley Veterans Serve 500 Years

Of the frequent and varied publicity of the Beaver Valley Traction Company no advertisement touched a warmer spot in the hearts of the men and the public than the full page announcement in the Beaver Falls *Tribune* recently, entitled "500 Years Training to Serve You." The introductory box at the top read:

There can be no greater evidence of loyalty and success of endeavors to please than that exemplified by length of service. Here we present twenty-four members of our personnel whose years of service total more than 500.

The illustrations comprised portraits of operators, flagmen, dispatchers, shopmen and others who had served from 16 to 25 years. The center of the page showed a drawing of the latest double-truck safety cars ornamented with the portraits of John R. Marshall, superintendent of transportation (24 years) and W. F. Allshouse, track foreman (24 years). The ad concludes:

We view the public as our friends and patrons and know that in the degree that we serve depends our progress, the progress of this company and the community.—Employees Beaver Valley Traction Company.

Owing to the popularity of the announcement, the advertisement was reprinted by C. D. Smith, general manager, on special paper for display in the homes of employees and others who wished to have a more permanent record than the newspaper publication.

Importance of Railway Told in Seattle Advertisements

The Seattle Municipal Railway, Seattle, Wash., has started a six months advertising campaign in the Seattle daily newspapers. The advertisements will appear in each of the four daily newspapers each week. An appropriation of $10,000 from the railway funds was made by the City Council a month ago to be spent under the direction of Clark R. Jackson, superintendent of public utilities, to stimulate travel. The contract for handling the advertising has been let to a local agency.

The campaign will deal with the importance of the railway to the city in promoting its growth and prosperity,

Seattle Advertises to Stimulate Traffic

the need of extensions and adequate service to stimulate the growth of industry, commerce and population and the measure of success attained in six years of municipal operation.

The public will be reminded of all of Seattle's scenic districts and beauty spots and advised as to how they may be quickly and comfortably reached by street cars, so that both residents and tourists may be aware of the large number of sightseeing trips possible by street car. In the Seattle Times of May 18 the following message was given to the public:

Few Seattle citizens, to whom rapidly moving street cars are a common sight of daily life, realize the important part the street railway system has played in the development of the city and its vital relationship to our present prosperity and our future growth.

Few who ride on street cars daily ever stop to think that Seattle would be a small saw mill center huddled along the waterfront today had not the street railway system, from the early days of the city, constantly stimulated the city's growth by extending car lines and furnishing the rapid transportation necessary to growth of industry, business and population.

Without the street cars, to get people rapidly from their home to work and about the city on their business, Seattle would have stagnated, instead of becoming the wonder city of the continent, for rapid transportation is the most important element in the growth of modern cities. Without the street cars industries and population would have located elsewhere.

What is true of the past is true of the present and will continue to be true in the future. Were street car service, the main means of rapid transportation, discontinued tomorrow, the productive capacity of Seattle's industry, business and citizens would be so reduced as to cause disaster to all.

If Seattle's street car service is not extended to meet the needs for growth of our industries, commerce and population, the growth we are enjoying will be retarded and Seattle will be robbed of its destiny as a great world city.

The real interest of Seattle citizens in the Municipal Street Railway System is not political but economic; on its successful operation and adequate service their individual prosperity largely depends. Its welfare is of personal interest to every one of them.

The Seattle Street Railway System, though successfully operated, has its problems. They are problems of public service which the individual citizens can help largely to solve. Following this announcement, we shall invite, through the newspapers, the help of Seattle citizens in solving some of those problems. It is your street railway and we invite you to give it your thought.

Central Interurban Station at Kansas City Unlikely

The project of a central interurban station in Kansas City, Mo., to cost the Interurban Central Station Company $3,000,000 appears about to fade into oblivion. C. C. Peters, president of the company, said that it is hard to foresee just what will happen. The City Council passed a franchise on Jan. 6, 1918, authorizing the company to build a station at Tenth Street and McGee Trafficway. The company posted $50,000 to guarantee that the station be built by Feb. 7, under an extension of the time fixed in the original ordinance. The Kansas City Railways was a party to the contract with the city, but the receivership of that company presented a further obstacle.

Definite plans were outlined on two occasions since the passage of the ordinance, but each time construction of the station was blocked by new obstacles. There has been little or no mention of the project recently, but there was much agitation for a central station following 1914. It is possible the plans may go forward, but much is said to depend upon how the court regards the railway agreement section of the franchise. Hughes Bryant, building adviser to the railway, is said to have expressed the opinion that the expenditure of a large amount of money in the construction of an interurban station is inadvisable under present conditions.

The site is now being used as a parking station at an annual rental of $20,000, enough to care for the taxes and all expenses of the property.

New Competition—Planes Between Springfield and Dayton

Hourly airplane passenger service between Springfield and Dayton, Ohio, will be started June 29. The flights will be made between Tecumseh field and Avondale field at Dayton, and planes will be able to transport two passengers and their luggage each trip.

Tecumseh fiying field is 4 miles west of Springfield in the National road and is reached by buses of the Columbus Dayton Transportation Company on the Dayton route. The buses also pass Avondale field in Dayton.

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Recent Bus Developments

Chicago Surface Lines Proposes Auxiliary Service—Pittsburgh Status Explained—First Interurban Auxiliary in Utah—Activities in Other Cities

THE first definite step to use the motor coach for auxiliary service has been taken by the Chicago Surface Lines in a proposal made to the city to forego the franchise requirements for this year's track extensions and substitute pneumatic-tired buses.

While the city claims the right to stipulate more than 20 miles of trackage extension a year, only half that amount was asked for by the local transportation committee of the City Council this year. The Surface Lines has $800,000 available and informed the Councilmen that this would build less than 10 miles, but that good service could be provided to outlying communities at less expense if the company bought several hundred buses instead of putting down track in sparsely settled communities.

The final authority in the matter is the Illinois Commerce Commission. No agreement has been reached between the city and company, but it is expected that at least part of the extension program will be dropped and the territory experimentally served by bus.

The City Council of Watertown, N. Y., recently granted the request of the Black River Traction Company to rescind its franchise on High, Factory and Pearl Streets, and at the same time granted the request of the Watertown Transportation Company to acquire the franchise to operate buses over these streets. Leon Schwerzmann, superintendent of the company, furnished statistics to show that this branch had eaten into the profits of the main line. In answer to the arguments of the New York Air Brake Company employees that the line must have paid during rush hours and that the line was needed by employees of the industries, Mr. Schwerzmann said the company would be glad to give the High-Pearl Street branch to them. All they would have to do would be to buy a couple of cars and furnish the power. He said the traction company would agree to accept transfers under an order of the Public Service Commission. The matter will now have to go before the Public Service Commission for its action. The petition of the company was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 23, page 829.

The interests that control the Pittsburgh Railways, Pittsburgh, Pa., will also control the buses, but the two will be conducted under different supervision. This statement was recently made by Thomas Fitzgerald, vice-president of the company, in announcing that preliminaries were now going on between the incorporators of the Pittsburgh Motor Coach Company and the Traction Conference Board, which would eventually decide the relations of the buses to the street cars. He said the bus experiment will start soon after an agreement is entered into with railway officials, board members, the Public Service Commission and officials of the coach company. There were a number of reasons why the Pittsburgh Railways could not operate buses, but the principal one was that the railway, just out of receivership, had not the credit to finance the purchase of equipment. He said that the value of the bus line was in its co-ordination with the railway; that where the cost of installing tracks, power plants and other expensive equipment was not warranted buses might sometimes be used to advantage.

The Utah-Idaho Central Railroad, operating an interurban railroad between Ogden, Utah, and Preston, Idaho, has applied to the Public Utilities Commission of Utah for a certificate of public convenience and necessity for the operation of a passenger and freight automobile stage line between Ogden and Logan, Utah, a distance of about 50 miles. The petition sets forth that such service would enable it to serve the public more adequately. It is asked that the certificate shall provide that "in all cases of bad roads or inclement weather, and when, from causes beyond its control or otherwise, it is impossible or impracticable to operate motor vehicles over said route, it be permitted to furnish said transportation service over its existing lines of railroad, so as to carry on uninterrupted its transportation service between the points named at all times during the year." This is the first instance, so far, in the State of Utah where an interurban railroad has applied for permission to operate an automobile stage line as an auxiliary to its railroad service.

The Reo Motor Car Company, Lansing, Mich., has established a fellowship in highway transport to be devoted to investigations under the direction of the division of highway engineering and highway transport of the University of Michigan, covering an approved subject relative to the utilization and operation of buses. The Reo Motor Car Company fellow will make investigations relative to the economic fields of bus transportation and efficient methods of operation for urban and intercity bus systems.

Selectmen of Millbury, Mass., have made known that no permits to operate buses between Worcester and Millbury will be granted this year, even to the Worcester Consolidated Street Railway. The Selectmen have ruled that the present railway service is sufficient. The Selectmen contend that if permits were issued the town might lose $14,000 in taxes now received from the Worcester Consolidated Street Railway.

Railway service has been supplemented by city bus service on the Wisconsin Power & Light Company's south side line in Sheboygan to determine which of the two methods is the more acceptable to patrons. If the trial bus service handles the traffic sufficiently cars will be taken from service on the south side. Buses will operate on the same schedule as the cars, at the same fare.

The City Council of Champaign, Ill., recently took the first steps to authorize bus service in the city by the Illinois Traction System when it passed an ordinance permitting the use of certain streets for bus operation. No routes have been designated. Transfers from bus to bus and from bus to street cars will be authorized. The railway plans to spend $150,000 for equipment, including a new garage.

It is said that an ordinance is being prepared by the Meridian, Miss., City Council to supplant the railway service of the Meridian Light & Railway Company by buses. At the request of the Mississippi Power Company, which recently acquired the traction property, the question is to be submitted to qualified voters at an early special election.

Four feeder routes, each about 1 mile long, will be started by the Omaha & Council Bluffs Street Railway, Omaha, Neb., as soon as delivery is secured on five White buses with Weir bodies. The company has recently been granted an increase in fare, as related in ELECTRIC RAILWAY JOURNAL for June 20, page 989. Transfers will be given free between trolleys and buses.

The Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is operating a new bus route on an hourly schedule between the Dempster Street terminal of the Niles Center line and Desplaines and at slightly longer intervals between Wauconda and Lake Zurich, popular northern Illinois summer resorts. The line is 29 miles in length. The running time is one hour and 25 minutes. The North Shore Line is operating special chartered coaches as well as regularly scheduled summer tours, as last year, the tours being of one, three and five days duration.

T. W. Wilson, vice-president and general manager of the Wilmington & Philadelphia Traction Company, Wilmington, Del., recently announced that the Delaware Bus Company, which is owned by the same interests that own the traction company, has purchased the Red Arrow Bus Line, Inc., operating between Wilmington and Marcus Hook, Pa. Mr. Wilson said that as soon as arrangements could be perfected through bus service on a frequent schedule would be operated between Wilmington and Chester.

An increase to 10 cents single fare and 7½ cents by book and 6 cents for school children is to be put into effect by the City Transit Company, operating the local bus service in Pomona, Cal. The bus company lost much money during six months operation and threatened for a time the abolishment of the service. Following several years of operation at a considerable loss the Pacific Electric Railway was allowed last year to discontinue electric railway service entirely in Pomona, following which the City Transit Company undertook to render a bus transportation service.

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The application of the Audubon Motor Bus Transportation Company of Yonkers, N. Y., for modification of an injunction which prevents it from operating on Central Avenue, Yonkers, was denied on June 19 by Supreme Court Justice Arthur S. Tompkins. Two months ago the Yonkers Railroad got the injunction against the bus company, alleging that it held exclusive franchises for operation on Central Avenue. In its petition the Audubon company sought permission to run buses only for members of the Central Taxpayers and Improvement Association of the Ninth Ward of Yonkers. The company asked for permission to operate only two buses in the morning and two in the evening. Members of the association joined in the petition. Justice Tompkins ruled that any modification of the injunction would work an unnecessary hardship on the electric railway.

The New York State Railways has added another link to its rapidly expanding bus system in western New York by the purchase of the Rochester-Holcomb line from Joseph H. Haf, Detroit. The line is to be extended to Penn Yan, 60 miles south of Rochester and in the heart of an extensive dairy and grape belt. The Haf interests have operated between Rochester and Holcomb for the past few months following purchase of the line from the Iroquois Motor Trails Corporation.

The Geneva, Seneca Falls & Auburn Railroad is considering supplanting its Geneva-Seneca Falls, N. Y., electric railway line with buses. Paving improvements in the village of Waterloo are said to have precipitated this scheme. The railway, it is declared, has been a losing venture for several years under the present operation.

Permission to extend its service by operating a bus line between Cincinnati, Ohio, and Indian View is sought of the Ohio Public Utilities Commission by the Cincinnati, Milford & Blanchester Traction Company. The bus line would connect downtown Cincinnati with the company's traction lines at Indian View.

The bill passed by both houses of the Legislature to give the Wisconsin Railroad Commission the right to order railways to operate buses in place of street cars has been vetoed by Governor Blaine. In his veto message he maintained that if the bill in question became a law it would make bus transportation practically a monopoly under regulation by centralized authority.

The bus line now being operated by the Philadelphia Rapid Transit Company, Philadelphia, Pa., from the Navy Yard to Broad Street and the Boulevard was extended recently to Broad Street and City Line. This extension has been made possible by the delivery of additional new double-deck buses. The fare for the entire trip, a distance of more than 13½ miles, is 10 cents, with the privilege of exchanging to and from all connecting surface car lines for an additional 3 cents. The buses are of the semi-inclosed top type, seat 67 passengers, are equipped with front exit, inside stairway and electric drive.

News Notes

One-Man Cars Meet Emergency.—Officers of the New York State Railways in Syracuse report that the experiment of running one-man cars on Sunday on the Salina Street route, the busiest in the city, was successful in its initial test and will be in force indefinitely. B. E. Tilton, vice-president and general manager, said eleven one-man cars were substituted for a like number of full-crew cars throughout the day, giving adequate service.

Fare Schedule Under Consideration.—The Illinois Power & Light Company, operating the Quincy railway system, apparently faces a fight in the Council to secure approval of its proposed tariff increases. The resolution and schedule of fares, referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 20, page 993, was laid over for consideration with an evident spirit of opposition among the Councilmen. The difference in fares for street cars and the buses the company proposes to establish brought some censure. A 10-cent cash fare with five tickets for 35 cents and $1 books of 40 tickets for children are basic rates proposed by the traction system.

Fares Increased.—Fares were increased from 7 to 10 cents on the lines of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa. This announcement was made recently by the City Council after Chicago auditors had reported on the audit of the books. It showed that unless the fares were raised the company would have a $35,000 deficit at the end of the year. Under the new rate the company will show a balance of $20,000, enough to pay a 5 per cent dividend, at the end of the year, it is claimed.

Wage Increases Provided.—The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has signed a new two-year contract with its employees providing for wage increases for nearly every group. An increase of 2 cents an hour this year for trainmen and an increase of 1 cent again in 1926 are provided. This makes the new scale 74 cents for 1925 and 75 cents for 1926. No changes were made in working conditions.

Court Sustains Commission's Order.—Judge Mann in Circuit Court recently sustained an order of the Arkansas Railroad Commission forbidding the Fort Smith Light & Traction Company from abandoning 1 mile of its line from Van Buren, Ark., to the Falcon Zinc & Smelting Company mine. Van Buren is only a few miles from Fort Smith.

Champions in First Aid.—The first aid team of the Chicago Rapid Transit Company, Chicago, Ill., won the state championship in competition with five other public utility teams on June 19 for the second successive time. It was the second annual championship contest held under the auspices of the Chicago chapter of the American Red Cross. The winner had an average of 99.20 per cent for the five problems. The training of the champions was under the direction of Dr. Hart E. Fisher, company surgeon.

Eight Cents in Leavenworth.—Authority for the Kansas City, Leavenworth & Western Railway to charge 8 cents fare in Leavenworth, Kan., was granted in an order handed down recently by the Public Service Commission. The old rate was 5 cents. The buses are charging 8 cents. Now the street car fare also is 8 cents, two tokens for 15 cents.

Franchise Changes Awaited.—The Greater Cleveland Transportation Commission is expected to report within the next few weeks recommending changes in the Cleveland Railway franchises as they affect the operation of the company's lines in the city of Cleveland and in Lakewood, East Cleveland and Cleveland Heights, Ohio.

Freight Lines Started.—Three electric railway companies, the Pittsburgh, Harmony, Butler & New Castle Railroad, the Pennsylvania & Ohio Light & Power Company and the Northern Ohio Traction & Light Company, have inaugurated a trolley freight line from Pittsburgh to Cleveland and intermediate points. The roads will compete with railroad freight service.

Mayor Wants "City" Parking Fairly Tried.—Protests from retail merchants over parallel parking in the downtown district of Oklahoma City, Okla., have not swerved Mayor Cargill in his determination to ascertain its effect on the traffic problem. Observation and investigation by representatives of the Oklahoma Railway reveal the fact that in practically no city of importance in the country is the 45-deg. angle parking permitted on streets where electric railways operate. The receivers of the company urged the city officials to try out the parallel parking plan, and an experiment for two weeks reveals that while under the old plan there were from two to five accidents daily due to automobiles backing out from the curb in front of street cars, there has been a complete absence of such accidents with the parallel parking.

Insurance on Employees.—The Cleveland Railway, Cleveland, Ohio, has placed group insurance on approximately 5,000 employees with the Travelers' Insurance Company. Those in service from six months to one year are insured for $750, from one to two years, $1,000, increasing $100 each year until a maximum of $2,000 is reached, after eleven years of service. The company bears the entire expense.

Railway Expansion in Tulsa Under Way.—Expansion of lines of the Oklahoma Union Railway in several directions from Tulsa is reported. Construction eastward is progressing at a good rate, with promise of continuous work until the Tulsa fair grounds and Mohawk Park are linked up with the city. At present the only difficulty in sight is a lack of right-of-way for a section of the route to Dawson. The next destination is Mohawk Park, which will be approached from the eastern side. The company has already agreed to establish bus service in that direction. The rail line will afford another connection with the Santa Fé road and take in a new freight territory. Beyond Mohawk the plans are not announced.

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Financial and Corporate

$54,965 Balance at Indianapolis

Revenue from Increase in Fare Disappointing—Company Eighteen Months in Arrears in Dividend Payments

The Indianapolis Street Railway, Indianapolis, Ind., reports a balance of $54,965 for the year ended Dec. 31, 1924, after the payment of all expenses, bond interest, sinking fund and $300,000 in dividends. This fact and others were made public following the annual meeting of the company on June 10. Included in the passenger receipts for 1924 is $122,910 derived from increased fares beginning May 21, 1924, all of which sum was expended for special maintenance and the improvement of the service, in accordance with the order of the Public Service Commission. There is also included in passenger receipts $24,971 from Broad Ripple service begun Sept. 1, 1924, and $1,103 bus service north of 34th Street started Dec. 4, 1924. While there was a total increase of $202,341 in revenue passenger receipts during the year 1924, there was a decrease of $133,761 in transfer receipts due to the charge for transfers being reduced from 2 cents to 1 cent beginning May 21, 1924, and a decrease of $7,534 in miscellaneous earnings, making the total increase in gross receipts $61,045.

The revenue derived from increased fares, effective May 21, 1924, namely, 7 cents cash and four tickets for 25 cents, with an extra charge of 1 cent for each transfer, as compared with the previous fare of 5 cents and 2 cents for each transfer, has been much less than anticipated. It was estimated that the increased fares would produce about $500,000 a year additional revenue, all of which would be set aside in a special fund and expended for the improvement of the service. From May 21 to Dec. 31, 1924, the revenue from increased fares over 1923 was $122,910, or an average of about $16,800 a month. From Jan. 1 to April 30, 1925, as compared with the same period for 1923, there is no increase, but as compared with 1924 there is an increase of $26,259.

In its order of April 18, 1924, the Public Service Commission of Indiana made the granting of increased fares contingent upon the company extending its city service to Broad Ripple on or before Sept. 1, 1924. Complying with this order the Indianapolis Street Railway on Aug. 14, 1924, leased from the Union Traction Company of Indiana that part of its line connecting with the tracks of the Indianapolis Street Railway at 46th Street on College Avenue and extending north on College Avenue to 63d Street, thence Eastward to Broad Ripple Park and into said park and began the operation of city cars to and from Broad Ripple on Aug. 31, 1924. Under this arrangement frequent city service is afforded residents of Broad Ripple at regular city fares, namely, 7 cents cash, or four tickets for 25 cents with a transfer for 1 cent to any of the city cars, as compared with a former cash fare of 10 cents and ten tickets for 75 cents without transfers.

The company is still eighteen months in arrears in the payment of dividends on its preferred stock. It paid four quarterly back dividends during the year 1924.

In presenting the report the directors said in regard to bus competition:

> Independent bus competition, referred to in the last annual report of the company, continues and some new lines have been added.
>
> The necessity of placing this unregulated type of transportation under proper restrictions was duly recognized and an act was passed at the last session of the Legislature placing buses under the control of the Public Service Commission.
>
> The growth and development of any city depends largely upon a reliable street railway system, which, in order properly to function, must have the undivided patronage and support of the local public.
>
> Whenever it is necessary to supplement the present railway service by the addition of buses, this should be done under the direction and control of the Indianapolis Street Railway. Only by such unified and co-ordinated operation can the best service to the public be rendered.
>
> When this patronage is divided both the city and the company are bound to suffer.
>
> On May 6, 1925, the Indianapolis Street Railway filed with the Public Service Commission a petition for a certificate of convenience and necessity to operate buses over certain streets of the city and such other streets as might be found necessary to provide for adequate city transportation. This matter is now pending.

EARNINGS OF INDIANAPOLIS STREET RAILWAY

Earnings	1924	1923
Passenger receipts:		
City lines	$4,804,890	$4,602,549
Transfer receipts:		
City lines	246,110	379,871
Miscellaneous earnings:		
Track rentals, etc.	537,175	544,710
Gross earnings	$5,588,176	$5,527,131
Maintenance of way and structures	631,201	643,950
Maintenance of equipment	516,272	516,798
Special maintenance expended from revenue from increased fares by order of Public Service Commission	122,910	.....
Total maintenance	$1,270,384	$1,160,748
Operation of power plant	771,997	850,844
Operation of cars	1,616,028	1,594,879
General expenses	425,338	427,887
Total operating expenses	$4,083,749	$4,034,360
Net earnings	1,504,427	1,492,771
Less taxes	384,354	419,868
Net earnings, less taxes	$1,120,072	$1,072,903

DISPOSITION OF NET EARNINGS OF $1,120,072 IN 1924

Deductions—Bond Interest:	
Interest on $4,000,000 Citizens Street Railroad's 5's	$200,000
Interest on $4,774,000 Indianapolis St. Railway 4's	193,947
Interest on $3,699,000 Indianapolis Trac. & Term. Company's 5's	185,072
Interest on $200,000 Broad Ripple Traction Company's 5's	10,000
Interest on trust equipment notes	3,565
Interest on Indianapolis Car Equipment Company, preferred stock	6,650
Interest on notes, etc.	35,871
Total deductions	$635,107
Surplus (exclusive of accrued depreciation)	$484,965
Deduction from Surplus:	
Indianapolis Street Railway Company sinking fund	$70,000
Indianapolis Traction & Terminal Company sinking fund	60,000
Dividends due on $5,000,000 preferred stock	300,000
Total deduction	$430,000
Balance	$54,965

Option Taken on Ottumwa Properties

A deal is pending for the purchase of the utilities at Ottumwa, Ia. Byllesby & Company, Chicago, have given an option until Sept. 1 to Bechtel & Company, Davenport, Ia., to purchase the Ottumwa Traction Company, operating 12 miles of line, and the other Ottumwa utilities included in the local division of the Northern States Power Company. George M. Bechtel of the firm which contemplates making the purchase is president of the Iowa Southern Utilities Company. The investment firm of which he is the head is said to be the largest of its kind in the state.

Foreclosure Proceeding Against Kansas Interurban

The First Trust & Savings Company, Chicago, trustee for the holders of the first mortgage bonds of the Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan., has brought foreclosure proceedings to have the road sold because of the failure to pay obligations due Aug. 1, 1924. Action on these proceedings was held in abeyance pending the outcome of the suit for restitution instituted by Receiver Jobes of the railway against J. J. Heim, majority stockholder. This issue has now been settled. It involved a transaction carried out shortly before the receivership. Mr. Heim contended that in good faith and for a valuable consideration he turned over to the company $212,500, par value, in second mortgage bonds, $47,500 in second mortgage coupons and an option for the purchase of one-half interest in the Kansas-Missouri Terminal Company. The option, however, never was exercised by the interurban line. In return he received $224,000 of first mortgage bonds. Mr. Jobes said the transaction would have the effect of making Mr. Heim a preferred creditor, a standing to which he was not entitled. The court has ordered Mr. Heim to return the $224,000 in first mortgage bonds and $6,720 interest on the bonds.

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City Begins Its Side in Baltimore Valuation

The United Railways & Electric Company, Baltimore, Md., concluded its testimony during the week ended June 20 in a hearing being held by the Maryland Public Service Commission to fix the valuation of the company's property. Clarence W. Miles, people's counsel, started to call his witnesses immediately. The case is still under way. A recess was taken until June 22.

Following the signing of a petition on the part of the commission the United presented testimony in connection with the issuance of a weekly ticket for $1. Mr. Miles brought this subject into the valuation hearing when he requested the commission to order the United to show cause why it should not put this system into operation. Charles D. Emmons, president of the United, pointed out that if 10 per cent of the riders should use the pass at $1 the revenues for the year would be reduced $500,000. Walter Jackson, Mount Vernon, N. Y., also testified. He pointed out the limitations of the system. Mr. Jackson appeared as a witness for the company.

People's Counsel Miles opened his side of the valuation hearing by declaring that a fair valuation of the United's properties is not more than $55,000,000. This is about $30,000,000 below the minimum figure given by President Emmons during a previous session. The first witness was Harry E. Gilbert, a real estate broker and tax assessor, who dealt with valuation figures on various items. He was subjected to rigid cross-examination by Edwin G. Baetjer and William H. Maltbie, representing the United. Mr. Gilbert placed the reproduction value of the company's buildings at $5,146,618 and from this amount deducted $1,429,728 for depreciation.

Pittsburgh Utilities in New Deal

The Standard Power & Light Corporation of Delaware has been organized by H. M. Byllesby & Company to acquire control of the Pittsburgh Utilities Corporation. It will have authorized capital of 500,000 shares of preferred, 800,000 shares of Class A common and 30,000 shares of Class B common, all of no par value. It is proposed to issue shortly 100,000 shares of preferred, 410,000 shares Class A and 30,000 shares Class B common. The Pittsburgh Utilities Corporation controls the utilities supplying electric power and light, gas, street railway and other services in Pittsburgh, Pa., and adjacent territory.

Ladenburg, Thalmann & Company, New York, and H. M. Byllesby & Company will jointly control Standard Power & Light Corporation. The United Railways Investment Company, which owns nearly all of the remaining voting shares of Pittsburgh Utilities Corporation, will be jointly controlled by Ladenburg, Thalmann & Company and H. M. Byllesby & Company. The latter have acted in this matter also for Standard Gas & Electric Company, which will have a substantial investment in both situations.

New Company to Hold Virginia Properties

Stone & Webster, Boston, Mass., and their associates have organized the Engineers Public Service Company, under the laws of Delaware, to acquire public utility properties directly or through subsidiaries. Through its initial purchase it will acquire more than two-thirds of the common stock of Virginia Railway & Power Company and will have voting rights in respect to a majority of the preferred stock of that company under arrangements whereby it may purchase such preferred stock prior to July 1, 1926, if it so elects. The company will acquire at an aggregate price of about $2,500,000, directly or through a subsidiary, the entire capital stock of Spottsylvania Power Company, a majority interest in coal properties now supplying a substantial portion of the requirements of Virginia Railway & Power Company and valuable water power rights and other properties in this territory. The policy of the company will be to acquire additional public utility properties when obtainable on advantageous terms. Several other properties are under consideration for purchase. Securities of the new company were offered for subscription on June 25.

Approval of South Shore Deal Asked

Preliminary plans for acquiring control of the Chicago, Lake Shore & South Bend Railway, better known as the South Shore Line, by the Midland Utilities Company, of which Samuel Insull is president, were taken in Chicago on June 24. A petition was filed with the Illinois Commerce Commission by the Chicago, South Shore & South Bend Railroad, a newly organized corporation, asking for authority to buy the property of the South Shore Line at the public sale to be held at Gary, Ind., on June 29. Authority was asked also for the issuance of securities to finance the purchase.

A petition seeking similar authority has also been presented to the Indiana Public Service Commission. As the railroad operates in both states, authority must be obtained from both commissions.

The Illinois Commission was asked to authorize the newly organized company to bid not to exceed $6,474,843 for the property. This is the amount of principal and interest due upon the bonds. The commission was asked to authorize the new company to issue the following securities:

Thirty-year 6½ per cent first and refunding mortgage gold bonds with a par value of $2,000,000.

Fifty-year 6 per cent second mortgage gold bonds with a par value of $250,000.

Fifty-year adjustment mortgage gold bonds, with a par value of $1,750,000, bearing no interest during the first two years, 2 per cent during the third year, 4 per cent during the fouth year, and 6 per cent annually thereafter.

150,000 shares of common stock without par value.

The Midland Utilities Company and the present bondholders will be jointly interested in the property after the reorganization. The Midland Company, however, will have a controlling interest and the operation of the lines will be under the management of Mr. Insull and his associates.

The present value of the physical property of the railroad is given in the petition as $5,836,943, exclusive of real estate used by the railroad in Cook County, Illinois.

The railroad has been in receivership since Feb. 28, pending the working out of a reorganization plan by the first lien holders' committee of Cleveland.

Conspectus of Indexes for June 1925

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer

Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Street Railway Fares*† 1913 = 4.84	June 1925 **7.27**	May 1925 **7.27**	June 1924 **6.97**	May 1925 **7.27**	May 1922 **6.88**
Street Railway Materials* 1913 = 100	June 1925 **152.4**	May 1925 **153.9**	June 1924 **157.6**	Sept. 1920 **247.5**	Oct. 1924 **148.5**
Street Railway Wages* 1913 = 100	May 1925 **222.4**	May 1925 **222.2**	June 1924 **220.0**	Sept. 1920 **232**	Mar. 1923 **206.8**
Steel—Unfilled Orders (Million Tons) 1913 = 5.91	May 31 1925 **4.05**	Apr. 30 1925 **4.45**	May 31 1924 **3.63**	July 31 1920 **11.12**	July 31 1924 **3.19**
U.S. Bank Clearings Outside N. Y. City (Billions)	May 1925 **17.10**	Apr. 1925 **17.72**	May 1924 **15.93**	Mar. 1920 **18.54**	Feb. 1922 **10.65**
Business Failures Number	May 1925 **1571**	Apr. 1925 **1658**	May 1924 **1739**	Jan. 1924 **2231**	Sept. 1924 **1277**
Liabilities (Millions)	**38.77**	**50.92**	**69.40**	**122.95**	**27.71**

	Latest	Month Ago	Year Ago	Since War High	Since War Low
Eng. News-Record Construction costs 1913 = 100	June 1925 **204.6**	May 1925 **207.2**	June 1924 **216.8**	June 1920 **273.8**	Mar. 1922 **162.0**
U.S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	May 1925 **155.2**	Apr. 1925 **156.2**	May 1924 **146.9**	May 1920 **247**	Jan. 1922 **138**
Bradstreet's Wholesale Commodities 1913=9.21	June 1 1925 **13.62**	May 1 1925 **13.32**	June 1 1924 **12.29**	Feb. 1 1920 **20.87**	June 1 1921 **10.62**
Dun's Wholesale Commodities 1913 = 120.9	June 1 1925 **195.2**	May 1 1925 **193.3**	June 1 1924 **183.8**	May 1 1920 **263.3**	July 1 1921 **159.8**
U.S. Bur. Lab. Stat. Retail food 1913 = 100	May 1925 **151.6**	Apr. 1925 **150.8**	May 1924 **141**	June 1920 **219**	Mar. 1922 **139**
Nat. Ind. Conf. Bd. Cost of living 1914 = 100	May 1925 **165.3**	Apr. 1925 **164.8**	May 1924 **161.4**	July 1920 **204.5**	Aug. 1922 **154.5**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 100 of the largest street and interurban railways in the United States, weighted according to the number of such men employed.

†Owing to the omission of certain increases in the compilation of this fare index, the figure for average fare, as reported in this Conspectus from October, 1924, to February, 1925, is too low by 0.07 cent. The corrected figures were published on page 635 of the issue of this paper for April 18.

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Warren & Jamestown Property Passes to New Hands

As a result of a business transaction between the Niagara, Lockport & Ontario Power Company and the Penn Public Service System, control of the Warren & Jamestown Street Railway and the Carrol Electric Light & Power Company passes from the hands of the Penn Public Service Corporation, which property took it over last year, to the Niagara, Lockport & Ontario Power Company. It was decided at the meeting to conduct the business of the Warren & Jamestown Street Railway, a 23-mile interurban between Jamestown, N. Y., and Warren, Pa., as a separate corporation, the stock of which is owned by the Niagara, Lockport & Ontario Power Company. The following officers were elected: H. B. Zimmerman, Jamestown, president; R. S. Hardy, Buffalo, vice-president; H. C. Mather, Buffalo, treasurer; C. E. Sundholm, Jamestown, assistant treasurer and auditor; Warren Tubbs, Buffalo, secretary, and J. F. Kirk, Buffalo, comptroller. Mr. Zimmerman said that the business of the Warren & Jamestown Street Railway would be conducted with the same service and the same personnel, as far as was possible.

Sale of Long Island Electric Railway Ordered

The Long Island Electric Railway, Long Island City, N. Y., operating between Jamaica and Brooklyn, Jamaica and the Belmont racetrack and also from Jamaica to Far Rockaway, has been ordered sold by the Queens Supreme Court before Justice Faber. This action is the result of the foreclosing of a $600,000 mortgage under which the Chase National Bank, the successor to the Hamilton Trust Company, is trustee for the bondholders. Gen. Lincoln C. Andrews was appointed receiver a year ago. The sale is complete and includes all rolling stock, tracks, Cedar Manor carhouse, terminal at Far Rockaway, with all rails, franchises and rights-of-way. State Senator John Karle of Evergreen was appointed referee in the case.

Statistics of Ohio Roads Made Public

Improvements and extensions of service of city railways in Ohio necessitated an increased investment of more than $3,500,000 last year. This is disclosed in a compilation of reports just filed with the Ohio Public Utilities Commission. The exact increase in the total investment of these companies was $3,571,634, bringing the total up to $123,573,233. At the same time taxes and operating expenses increased, the reports show. The total operating expenses were $31,171,325. This is $101,458 higher than the year before. Taxes were boosted by $825,875, bringing the total tax payments to $4,178,230.

Only eight of the seventeen city street railways paid dividends. Last year these lines carried 726,508,833 passengers. Taking the 1920 census as a basis, the number of passenger rides on these lines would be equal to 126 rides for every man, woman and child in the state.

An increase in freight revenue of almost $500,000 is one of the outstanding features of the combined annual reports of interurban railways in Ohio. This reveals that city shippers and farmers are gradually turning to the electric interurban for quick freight service. An increase in the total investment of these companies for the year was $21,703,230, the new money being needed for freight equipment, buses and extension of electric light and power lines operated by the electric railways.

The total investment of the interurbans at the first of the year was $234,337,969. Taxes paid were $2,432,277, or $46,774 each week. There were 60 interurban railways in the State, operating a total of 2,708 miles of track.

Holmesburg Line Sold.—The receivers of the Frankford, Holmesburg & Tacony Street Railway, Philadelphia, Pa., sold on June 19, for $350,000, its equipment, tracks, franchise and real estate. The bid of John Gilpin, who acted for the bondholders' protective committee, was accepted. It was the minimum offer under order of sale issued by the Court of Common Pleas. The sale was a matter of form to clear away the receivership, it was stated, in advance of the city-P. R. T. agreement as to purchase and operation of the line as part of the Philadelphia Rapid Transit system, in which the city is a partner.

Property Formally Transferred.—Property at Third and State Streets purchased several years ago by the Buffalo & Lake Erie Traction Company in the name of A. F. Tideswell, treasurer of the company, was recently formally transferred to the Erie Railways, Erie, Pa., successor to the old Buffalo & Lake Erie Traction Company. The property was included in the purchase of the traction company property last year but the transfer had not been formally made.

Partial Abandonment Allowed.—The Public Service Commission has approved the abandonment by the New York & Stamford Railway of that part of its lines in Rye located on Purdy Street and that portion of the Boston Post Road from Purdy Street to Peck Avenue and in Peck Avenue. There was no opposition to the proposed abandonment.

Seeks to Abandon Line.—The Chautauqua Traction Company has petitioned the Public Service Commission for permission to abandon that part of its line between Mayville, N. Y., and Westfield, about 9 miles, and to connect its line with the Jamestown, Westfield & Northwestern Railroad at the Pennsylvania Railroad station in Mayville. Both the Chautauqua Traction and the Jamestown, Westfield & Northwestern lines are controlled by the same management.

Sale of Properties Proposed.—In a petition filed with the Public Service Commission at Salem, Ore., on June 17, H. D. Wagnon, Portland, proposed the purchase of the railway properties of the Portland Electric Power Company by the city of Portland. He urged the reduction of fares from 8 to 5 cents, extension of transfer privileges and liquidation of the annual deficit by the taxpayers of the municipality. The petition further urged that patrons of the railway be allowed to intervene in the action brought by the housewives' council of Portland to obtain lower fares on the lines of the defendant corporation. The petition of the housewives' council will probably be heard by the commission by July 1.

Tractions Display Strength on Indianapolis Exchange.—A display of strength of various interurban and street railway securities in Indiana has been noticed lately on the floor of the Indianapolis Stock Exchange. There have been trades in several traction issues, dormant for weeks, bid prices being marked higher than for some months. The rise in quoted prices of traction securities seems to be general.

Declaration on Account of Back Dividends.—The Washington Railway & Electric Company, Washington, D. C., has declared a dividend of $20 on the common, on which payments were passed from March 1, 1919, to June 1, 1923. Out of $6,000,000 impounded by the Utilities Commission pending determination of rates of which $500,000 was set aside for paying federal and district taxes, the railroad received $2,944,222, of which the total amount declared for dividends on the common stock of the company for the years in which dividends were passed amounted to $1,300,000. The dividend is payable on July 1.

Increase in Net Income.—For the eleven-month period ended May 31, 1925, the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., had total operating revenue of $39,550,536, against $36,498,974 for a similar period ended in 1924. Total operating expenses advanced from $24,239,102 to $25,930,098 for the period ended May 31, 1925. After the consideration of income deductions net income this year was $4,643,080, against $3,518,522 for the eleven-month period ended May 31 of last year.

New Directors at Jamestown.—William A. Broadhead, Frank E. Gifford, Fletcher Goodwill, Homer M. Preston, William R. Reynolds, William A. Broadshaw, George E. Maltby, George L. Maltby and Robert H. Jackson comprise the new board of directors of the Jamestown Street Railway, the Chautauqua Traction Company, Jamestown, Westfield & Northwestern and the Jamestown Motor Bus Transportation Company. Members of the board never previously associated with the Broadhead traction interests in Chautauqua County are Messrs. Goodwill, Preston, Bradshaw and Jackson.

Two-Mile Road to Be Sold.—Complications growing out of the failure of the Huntingdon Bank led to a court order on June 25 for the sale of the property of the Huntingdon, Lewistown Juniata Valley Traction Company at Huntingdon, Pa., on July 27. Default by the company in the payment of semi-annual interest due on a mortgage held by the bank's assignee resulted in the court order. Huntingdon has a population of 8,000. The road consists of 1.75 miles of track. There are six cars.

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Personal Items

W. F. Kelly in New Office

Well-Known Engineer Becomes Chairman of the Board of the Chester Valley Lines

William F. Kelly, formerly vice-president of the company, was elected chairman of the board at a recent meeting of the stockholders of the West Chester Street Railway, West Chester, Pa. This company, together with its bus subsidiary, the Peoples Transportation Corporation, the combination being popularly known as the Chester Valley Lines, controls a transportation system serving more than 1,000 square miles in Chester, Delaware and Montgomery Counties in Pennsylvania and the northern portion of Delaware.

Mr. Kelly was graduated from the University of Pennsylvania in 1892

W. F. Kelly

and received a post-graduate degree the following year. He has been engaged in engineering work since then, mostly for railway, electric power and other public utility properties. As assistant engineer with the Union Traction Company in Philadelphia and later as assistant to the chief engineer of the Metropolitan Street Railway System in New York City, his experience has covered a wide field in design and construction of practically all departments of electric railway service.

For fourteen years he was associated with the engineering firm of Ford, Bacon & Davis, New York. He had charge of the construction of much of their important work in Birmingham, Ala., and Memphis, Tenn., Youngstown, Ohio, and other towns in the Eastern, Southern and Middle States. He also was engaged in special investigations, valuations and reports on many of the large utility systems of the country.

Since 1915 he has been a member of the engineering and management firm of Kelly, Cooke & Company, Philadelphia. Most of this firm's activities have been devoted to public utility properties. For it Mr. Kelly has examined and reported on a great number of situations in the United States and been called to appear before utility commissions on matters of valuation, service and rates. In recent years the firm has been doing some notable work in connection with rejuvenation of electric railway properties and the improvement of their public relations.

The development of the Chester Valley Lines, which is controlled and managed by Kelly, Cooke & Company, was described in the ELECTRIC RAILWAY JOURNAL for Nov. 22, 1924.

Appointments at Detroit Announced

Rufus G. Lathrop, a Detroit attorney, has been appointed secretary to the Street Railway Commission at Dethe Street Railway Commission at Detroit, Mich. Mr. Lathrop was appointed by the commission upon the recommendation of former Judge James O. Murfin and John C. Lodge, president of the City Council. He succeeds I. N. Merritt.

W. M. Hauser of the Detroit Rapid Transit Commission has been appointed auditor for the street railway department, assuming part of the duties of Mr. Merritt, who was auditor as well as secretary to the commission.

There has been no new appointment to fill the position at the head of the claims department vacated by the resignation of Clarence E. Wilcox. Immediately following the dismissal by the commission of Mr. Schram and Mr. Merritt, the commission received the resignation of Mr. Wilcox, head of the legal division, and H. B. Shelden, chief claims agent. Mr. Wilcox addressed his letter to Mayor Smith, the Street Railway Commission and H. U. Wallace, general manager, asking that his resignation be accepted to take effect immediately.

The duties of the head of the claims department are now being carried out by the Corporation Counsel's office, which is headed by Charles P. O'Neil. A. L. Barkey of the city staff has been placed in immediate charge.

Mr. Wilcox, the former head of the claims department, was appointed to that position early in 1924 by acting Mayor Joseph A. Martin. His appointment was contested by Corporation Counsel Richard I. Lawson, as illegal. Mr. Lawson was later dismissed by Martin, and George A. Kelley, who was appointed to succeed him, approved the appointment of Mr. Wilcox.

General Andrews Receives Degree

At the commencement exercises of Trinity College, Gen. Lincoln C. Andrews, Assistant Secretary of the Treasury, receiver of the New York & Queens County Railway, Long Island City, and one of the best-known men in public life in Queens, received the honorary degree of doctor of laws.

Promotions on North Shore

Messrs. Thompson and Fallon Vice-Presidents—J. S. Hyatt in New Office of General Manager

Charles E. Thompson and Bernard J. Fallon were elected vice-presidents and Jesse S. Hyatt was appointed to the new office of general manager and also made chief engineer at a recent meeting of the board of directors of the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

The promotion of Mr. Thompson came shortly after the close of his twentieth year of service with electric railways, seventeen of which were spent with the North Shore Line. His first job with the company was chief clerk to the auditor, which also carried with it the duties of paymaster. At that time the line was operated between Evanston and Waukegan.

In 1907 Mr. Thompson was made auditor, but later he served as purchasing agent. In 1915 and 1916 he was general manager. When the line came under the management of Samuel Insull and associates Mr. Thompson

C. E. Thompson

was made assistant to the president. This position he held until the time of his most recent promotion.

Mr. Fallon's service began with the North Shore Line when it came under its present management, he having served previously with the Chicago Rapid Transit Company. His service with the latter company approximates twenty years. He was engineer maintenance-of-way, general manager and for the past year vice-president in charge of operation. He held the position of chief engineer with the North Shore Line at the time of his election as vice-president.

Mr. Hyatt began work with the North Shore Line in 1903 as a rodman during the period of construction of the railroad. Later he was employed by the Grand Trunk Pacific Railroad, but returned to the North Shore Line in 1905. With the exception of two years from 1910 to 1912, when he was employed as secretary and treasurer of the Lake County Telephone Company, he has since served with the North Shore Line. He was engineer maintenance-of-way at the time of the recent election.

Lincoln C. Torrey, formerly assistant

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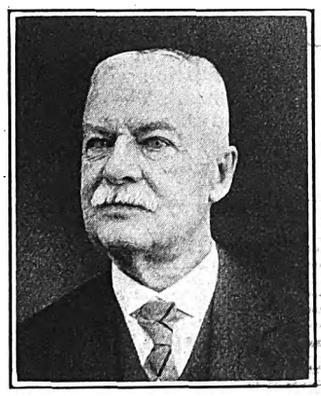
treasurer, was made assistant secretary in addition at the directors' meeting. Mr. Torrey came to the North Shore Line in 1921 from the Goodyear Tire & Rubber Company in Akron, Ohio. He has served the company as engineer, auditor and valuation engineer in addition to the above duties.

New Personnel in Charge of Broadhead Interests in Jamestown

Homer M. Preston has been elected president of the Jamestown Street Railway, the Chautauqua Traction Company, the Jamestown, Westfield & Northwestern Railway and the Jamestown Motor Bus Transportation Company, all of Jamestown, to succeed the late Almet N. Broadhead, who controlled all of these companies. While separate corporations will be continued, the traction and bus lines will be operated under one general management, and the officers and directors of the companies will be identical.

Mr. Preston formerly was a director and vice-president of the Warren-Jamestown Street Railway, in which



G. E. Maltby

capacity he served many years. He also has been associated with the Southwestern Interurban Company, operating in Kansas, and also of the Union Traction Company, Coffeyville, Kan.

George E. Maltby, who has been general manager of the Broadhead traction lines for 40 years, has been promoted to the position of vice-president, with general supervision over all the Broadhead traction system. His connection with the Jamestown Street Railway dates back to the days of horse cars.

George L. Maltby, a son of George E. Maltby, has been appointed general manager of the various traction lines. Until last September he had been superintendent of the lines for fourteen years, but resigned to enter the automobile business. He now returns to the affiliated companies as general manager.

The executive committee in charge of the operation of the properties includes Messrs. Preston, Broadhead and Robert H. Jackson.

Harold Evans has been appointed to the Pennsylvania Public Service Commission.

Many Changes on New Haven

N. M. Rice New Vice-President—C. L. Bardo on Leave of Absence—Other Appointments Made

N. M. Rice, for the last five years general purchasing agent of the New York, New Haven & Hartford System, has been elected vice-president of the company in charge of purchases and stores. Mr. Rice was formerly vice-president in charge of purchasing and stores on the Atchison, Topeka & Santa Fé Railroad.

J. O. Halliday, superintendent of transportation, has been appointed manager of transportation, reporting to the general manager. He will co-operate directly with the freight traffic manager and the passenger traffic manager. Mr. Halliday has been on the New Haven System for a long period.

C. L. Bardo, general manager, having requested leave of absence, the duties and authority of general manager will devolve upon and be exercised by J. A. Droege, general superintendent of the New York Division. He is appointed acting general manager. Mr. Droege in various capacities and at different times has been in charge of operation of all parts of the New Haven System. Mr. Bardo is particularly well known in electrical engineering circles. He was formerly superintendent of the electric division of the New York Central Railroad at New York.

W. H. Foster, general superintendent Lines West, with office at New Haven, has been appointed general superintendent of the New York Division.

E. E. Regan, superintendent of the New Haven and New London Divisions, has been appointed acting general superintendent Lines West.

W. L. Bean has been made mechanical manager to take the place of L. N. Reed, resigned. Mr. Bean went to the New Haven Railroad in 1916 as assistant to Mr. Pearson in his investigation of the property, and in formulating the report and recommendations in accordance with which the program for the improvement of the property was undertaken. In 1917 Mr. Bean was made assistant general mechanical superintendent, and on Nov. 1, 1918, mechanical assistant to the president. He acted in that capacity until Dec. 1, 1923, at which time he was made assistant mechanical manager.

George A. Moriarty, mechanical superintendent Lines East, has been appointed general mechanical superintendent, with office at New Haven.

The title of H. P. Hass, special assistant to mechanical manager, has been changed to assistant to mechanical manager.

F. E. Ballda, assistant to mechanical manager, has been appointed mechanical superintendent Lines East, with headquarters at Boston, vice G. A. Moriarty, promoted.

Kenneth Cartwright has been appointed assistant mechanical engineer in charge of specifications, design, records and standards of equipment.

J. E. Slater, formerly special assistant to the general manager, has been made assistant to the general manager. E. B. Perry has been appointed assistant to the general manager. Mr. Perry has been supervisor of wage schedules. In their new capacities Mr. Slater will represent the general manager in all budget matters and will have charge of the analysis of operating performances and costs, while Mr. Perry will represent the general manager on matters affecting wages, working conditions, and group insurance. The titles of special assistant to the general manager and supervisor of wage schedules have been abolished.

F. V. Underwood General Manager in Knoxville

Fred V. Underwood, for many years associated with electrical interests in Alabama, has just been appointed general manager of the Knoxville Power & Light Company, Knoxville, Tenn. Up to the present time C. H. Harvey has been president and general manager at Knoxville, while H. U. Wallace, recently appointed general manager of the municipal railway at Detroit, for-

F. V. Underwood

merly was assistant general manager of that property. Mr. Underwood will have direct charge of railways and the respective heads of the transportation, mechanical, way and structures and line departments will report to him.

Mr. Underwood entered the public utility field in 1900 in the employ of the Consolidated Electric Light Company of Birmingham. This company later became part of the Birmingham Railway, Light & Power Company, now the Birmingham Electric Company. He continued with the Birmingham properties through their reorganizations to the present time. A practical operating man, he has worked his way through various positions with the Birmingham company to be assistant general manager.

During the World War Mr. Underwood was for a short time connected with the Alabama Power Company as superintendent of production, having charge of its generating plants. His principal attention, however, was given to the operation of the Gorgas plant, where construction work was rushed in order to furnish power for nitrate plants at Muscle Shoals.

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Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Increasing Efficiency in Production

Manufacturing industries are making astonishing progress in efficiency, recent calculations show. Production of manufactured goods in 1923 was 65 per cent greater than that of 1914. The increase in personnel was only 25 per cent. While some other factors enter into the comparison, the principal causes responsible are held to be increased efficiency in management, an increase in the skill of workers and the increased use of machinery. The entire increase in personnel was among the wage workers. Apparently it has been found possible to increase output without increasing the staff.

High prices of materials and high wages have stimulated efficiency. When the railroads were paying 75 cents a ton for coal, for instance, they paid little attention to its conservation. Subsequent high prices of the fuel, however, stimulated its more efficient use.

The systematic effort to stimulate efficiency and sensible conservation has been known as the program for the elimination of waste in industry. The term is not regarded as a satisfactory one, as it conveys to the public an implication of willful waste.

Demands for Space Unprecedented

Previous records of requests for space at the October convention have all been broken. To the close of business June 23, 139 companies had applied for 76,689 sq.ft. The similar date last year shows that 91 companies had applied for 47,810 sq.ft. The increase is 48 applicants and 28,879 sq.ft.

The exhibit committee will assign space on July 1. All applications received up to the close of business June 30 will have the committee's attention at this meeting.

Should any space remain after the initial allotment has been made, it will be assigned by the director of exhibits in the order in which applications are received.

Patent Office Situation Is Improving

Greater liberality on the part of Congress in the matter of appropriations has improved the Patent Office situation somewhat, but it is recognized that the trouble is not all due to lack of funds.

Means of improving practice on the administrative side now are being considered. One way would be to relieve the Commissioner of part of his judicial functions. To this the patent lawyers object. They seem to think the present cumbersome appeal machinery is necessary. A question raised by the examiners, under present procedure, can be appealed to a board of examiners, then to the Commissioner, then to the Supreme Court of the District of Columbia, then to the Court of Appeals, and finally to the Supreme Court of the United States. Some think "six jumps to justice" are too many.

Other industrial countries require the commercial production of the article patented within certain time limits. This makes it necessary for American inventors to start manufacturing plants all over the world. On the other hand, Germany and England, for instance, by taking out patents here can prevent manufacture in this country. Equality of treatment to American inventors will be sought at The Hague.

Chicago "L" Rushing Improvement Plans

Word has been received by the Chicago Rapid Transit Company that the first of the 100 additional steel cars, recently ordered, will arrive about July 1. All of these new coaches are expected to be in service by Oct. 1. They are under construction in the shops of the Cincinnati Car Company, and are the same as the modern plush-seated steel cars recently placed in service, except that motors and running equipment have been improved.

Rolling Stock

New York, New Haven & Hartford Railroad, New York, is in the market for 50 buses as equipment for its new motor transportation subsidiary, the New England Transportation Company. All equipment to be ordered at present will be for passenger business, and bids will be asked of several manufacturers.

Coast Cities Railway, Asbury Park, N. J., recently placed in service on its line between Asbury Park and Long Branch, N. J., seven light-weight, double-truck, one-man, two-man cars built by the J. G. Brill Company and referred to in the ELECTRIC RAILWAY JOURNAL, issue of Jan. 10, 1925. The new cars are equipped with automatic safety devices, air-operated sanders, and electric motorman signal system. Trucks are of the Brill lightweight No. 77-EX type, 5 ft. x 4 in. wheelhase and equipped with 26-in. diameter wheels. Quadruple 35-hp. motors are mounted on these trucks. Doors on both sides of each platform are of the double two-part folding type pneumatically operated. The seating capacity is 40. All seats are upholstered in brown imitation leather. Interior woodwork is of cherry stained mahogany. Agasote is used for headlining and also for the inside lining below the window sills.

Track and Line

Hull Electric Company, Hull, Que., contemplates paving about 1,000 ft. with concrete and asphalt on Laurier Avenue and Hotel de Ville Street.

Morris County Traction Company, Morristown, N. J., is to seek permission in the United States District Court at Newark to spend between $135,000 and $140,000 for improvements to its tracks in Dover, Madison and Chatham. It is estimated by the company that 30,000 sq.yd. of paving will be required for the three municipalities. Preliminary arrangements with the State Highway Commission were disposed of recently and the necessary formalities attended to by the company's receivers.

Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., is eliminating two right-angle curves in Milwaukee by means of a diagonal right-of-way through two city blocks from the start of one of the curves to the end of the second. The new route is so short that it will not materially reduce the running time, but it will make for safer operation. It is expected that the new track will be in use early in July.

St. Johns Electric Company, St. Augustine, Fla., is extending its line to the beach, which has been cut off from trolley communication with the city for about three years. The present track is being relaid far enough inland to make it safe, as the old track had been washed out in one of the fall storms.

Trade Notes

Hynes & Cox Electric Corporation, Albany, N. Y., is doing work along industrial heating lines and expects to follow up shop and power house possibilities in the railway field. Lee P. Hynes, the president of the corporation, formerly was consulting engineer for the Consolidated Car Heating Company. Theodore M. Cox is vice-president and treasurer of the Hynes & Cox Electric Corporation.

Economy Electric Devices Company, Chicago, Ill., has received an order to equip the Atlanta property of the Georgia Railway & Power Company with Economy meters having dials for car inspection on the kilowatt basis. This job will total 300 meters.

Metal, Coal and Material Prices

Metals—New York	June 23, 1925
Copper, electrolytic, cents per lb	13.625
Copper wire base, cents per lb	15.50
Lead, cents per lb	8.20
Zinc, cents per lb	7.33
Tin, Straits, cents per lb	56.50
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.275
Somerset mine run, Boston, net tons	1.975
Pittsburgh mine run, Pittsburgh, net tons	1.95
Franklin, Ill., screenings, Chicago, net tons	2.125
Central, Ill., screenings, Chicago, net tons	1.775
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$6.25
Weatherproof wire base, N.Y., cents per lb.	18.00
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N.Y., per gal.	$1.05
White lead in oil (100-lb. keg), N. Y., cents per lb.	0.1575
Turpentine (bbl. lots), N.Y., per gal.	$1.03

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June 27, 1925

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New 60-ton electric locomotive recently built for this service has interesting features. Severe winter weather presents an operating problem.

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Saving Your Time

ONE of the most important features of any business paper is its reference value to its subscribers. The staff of ELECTRIC RAILWAY JOURNAL is always willing to locate articles for its readers. Many requests of this kind are received and all are given prompt attention, but at best some time must elapse before the answer can reach the inquirer. Even the shortest delay may mean considerable inconvenience to the person waiting for information.

Accordingly the publishers have placed at the disposal of each reader the means of locating articles for himself in a minimum of time. Each week the articles are listed in the contents, and twice a year at the close of the volume a complete subject index is published. The index for Vol. 65 is complete in this issue. The subscriber is thus enabled to have his volume bound complete with the index immediately thereafter.

In case the reader does not bind the volumes but files the issues for future reference, the indexes may be placed conveniently at hand and thus be readily available for reference should it be desired to locate any particular article. Reference to the table on the first page of the index indicates the date of the issue in which a given page number was published. Complete instructions are also given on how to use the index.

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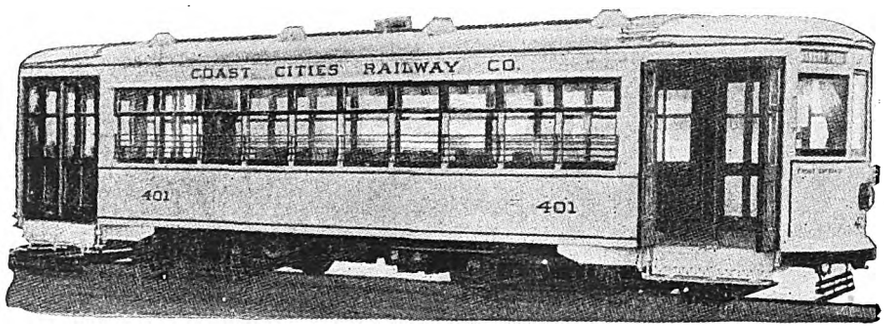

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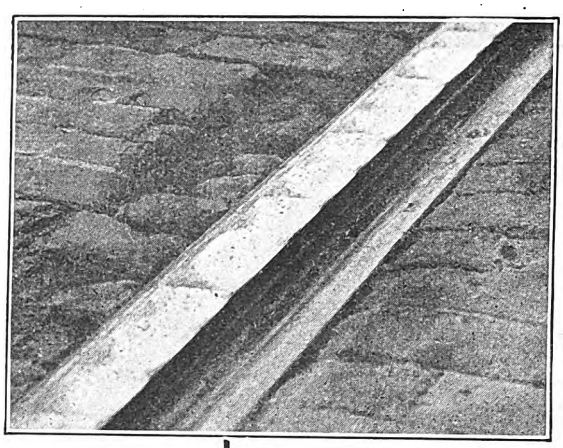

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Second, it does the work rapidly, and no less thoroughly where corrugations are light.

Third, it does not waste time and rail material running back and forth over track where corrugations have not yet appeared.

Fourth, it can be operated by track laborers at track laborer's day-time wages—no night overtime or high-priced men to pay. It does not interfere with traffic.

Fifth, rail-head is re-shaped to its original contour, clear over to the gage line.

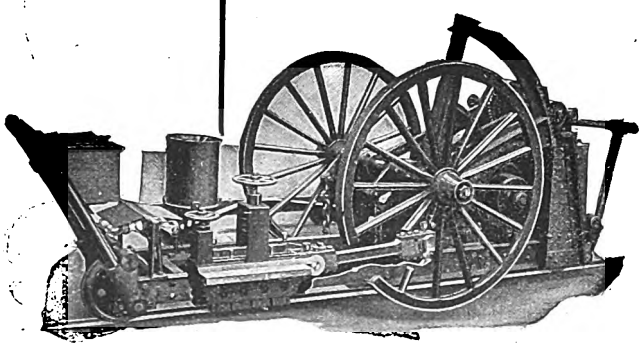

Figure Costs Right

What you want is lowest cost per foot of actually corrugated rail ground perfectly smooth—*not* merely low cost per foot of total trackage passed over, *nor* merely low cost of partly removing corrugations. There is a big difference. Figured accurately, cost of removing corrugations is always lowest on the many roads which depend upon and use their Reciprocating Grinders. Would you like further data?

Railway Track-work Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:
Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Atlas Railway Supply Co., Chicago
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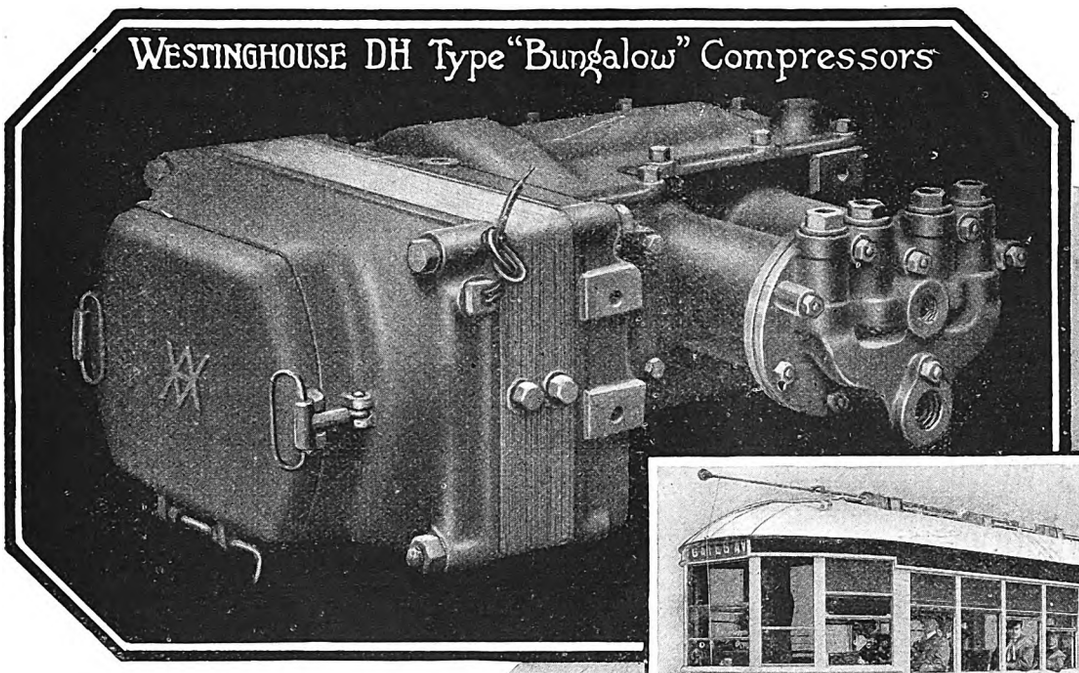
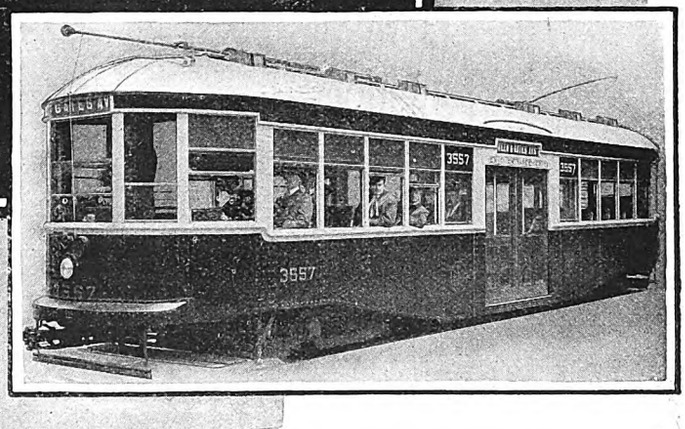
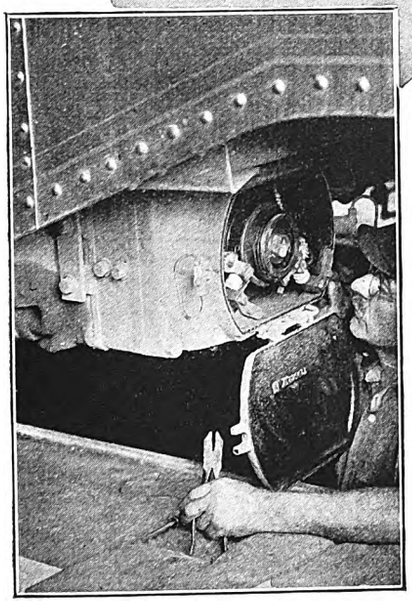




Properly Constructed for Low-Built Cars



EASY TO GET AT

DH Compressors are highly popular with maintenance men owing to the quick and easy manner in which access may be gained to all parts. This feature encourages regular and careful inspection.

Many cars being constructed today are of the low-floor type, and for such cars the DH Compressor was "made-to-order."

In addition to fitting snugly in small spaces and providing ample track clearance for the lowest cars, DH Compressors offer a degree of mechanical perfection which appeals to the cautious buyer with an eye to steady, dependable service, long life and low maintenance cost.

The "Bungalow" Compressor is built in sizes suitable for all classes of traction service—of the same general design and properly constructed for low-built cars.

Westinghouse Traction Brake Company
General Office and Works: Wilmerding, Pa.

WESTINGHOUSE TRACTION BRAKES

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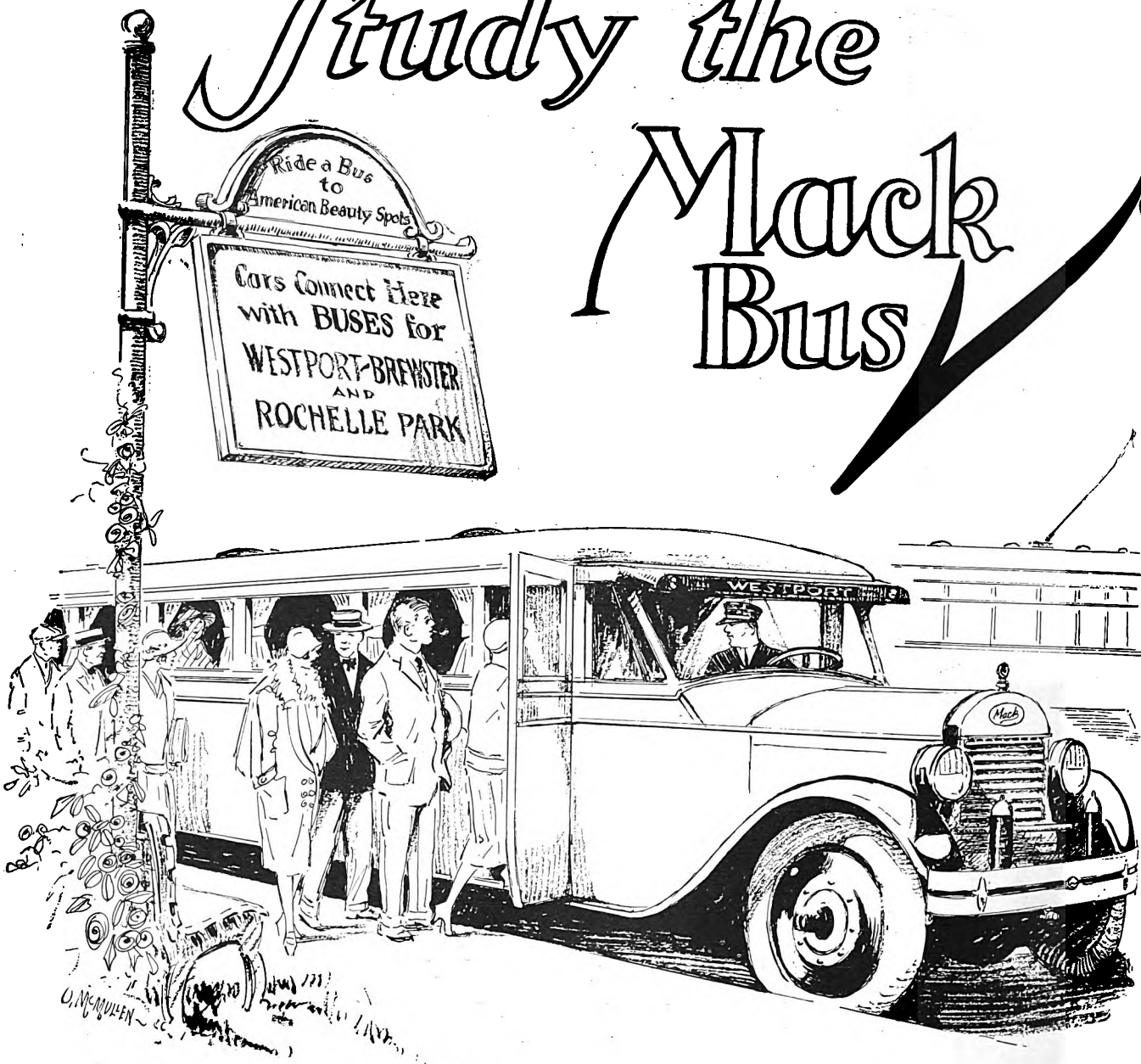
Study the Mack Bus



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as a key to the profitable "summer traffic" field

THE call of the great out-doors invites tourists and pleasure-seekers to ride buses.

The bus route is the scenic route. The winding ribbon of highway beckons, slipping smoothly between hill and valley. Glimpses of sun-lit spots and cool shadowed nooks flash by. And relaxing in a comfortable seat, the passenger who rides in a Mack Parlor Car Bus mentally thanks the electric railway that places such service at his disposal.

The call of the great out-doors is a call to railways to increase revenue and build good-will by extending bus service to the garden spots of recreation adjacent to their routes.

Unquestionably, Mack Buses are a logical choice when it comes to deciding on equipment.

Mack has the all-bus chassis.

Mack has the Shock Insulator Suspension whereby all spring ends are embedded in cushions of live resilient rubber, which effectively absorbs all minor crystallizing road shocks.

Mack has the famous improved Mack engine, and a score of other features that contribute to passenger comfort and operating economy.

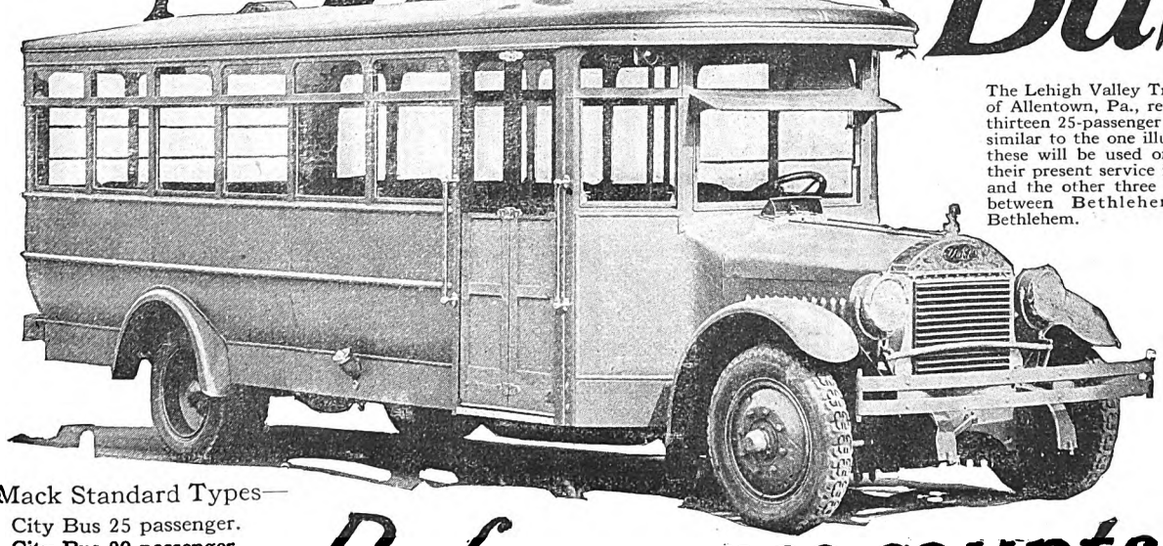
Chapter 7 of Bus Operation Practice; the Mack 200-page manual of bus operation, treats in detail with the question of promoting summer and feeder traffic. You can secure a copy by communicating with the nearest Mack Branch or direct with our general offices at 25 Broadway, New York.

How about getting a first-hand picture of how a Mack bus will operate over your route? Your nearest Mack branch will gladly arrange to take care of you with a demonstration. Why not call up and set a time?

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 Broadway, New York City

Eighty-eight direct MACK factory branches operate under the titles of "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION" AND "MACK MOTOR TRUCK COMPANY"

The Mack Bus



The Lehigh Valley Traction Company of Allentown, Pa., recently purchased thirteen 25-passenger City Type buses similar to the one illustrated. Ten of these will be used on feeder lines to their present service in Hazleton, Pa., and the other three will be operated between Bethlehem and South Bethlehem.

—Mack Standard Types—
City Bus 25 passenger.
City Bus 29 passenger.
Parlor Car Bus.
Sedan Bus.

Performance counts!

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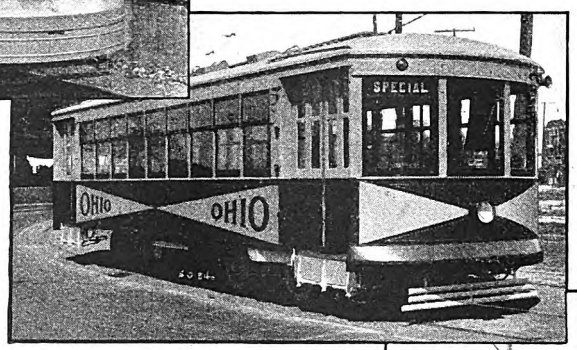
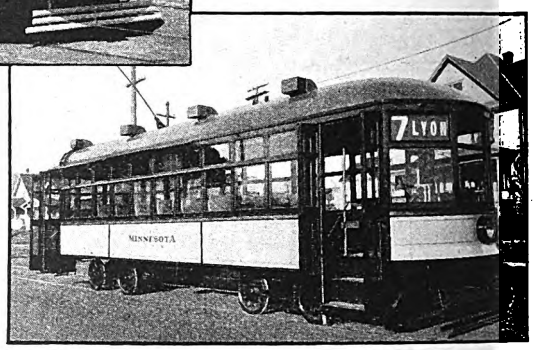


It is a Safety Car if equipped with our standard Safety Car Control Devices.

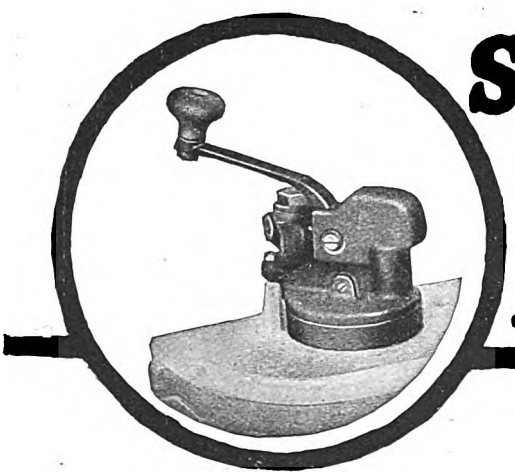
GRAND RAPIDS



"Innovations" all have *Standard Safety Car Control*

Safety Cars have been operating long enough in Grand Rapids to demonstrate the advantages of this type of transportation—the one-man-operated car properly protected by labor-saving and safety elements, as embodied in the Safety Car Control Equipment—and 70% of the service is of this type. Contemplated purchases will bring this up to 90%.

Although the three sample light weight cars recently put into service by this company differ radically from previous types of cars in many elements of design and equipment, yet, they all have the standard Safety Car Control—a significant indication of confidence in the equipment that has proved its merits by long and extensive service.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.
Postal and Telegraphic Address:
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CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

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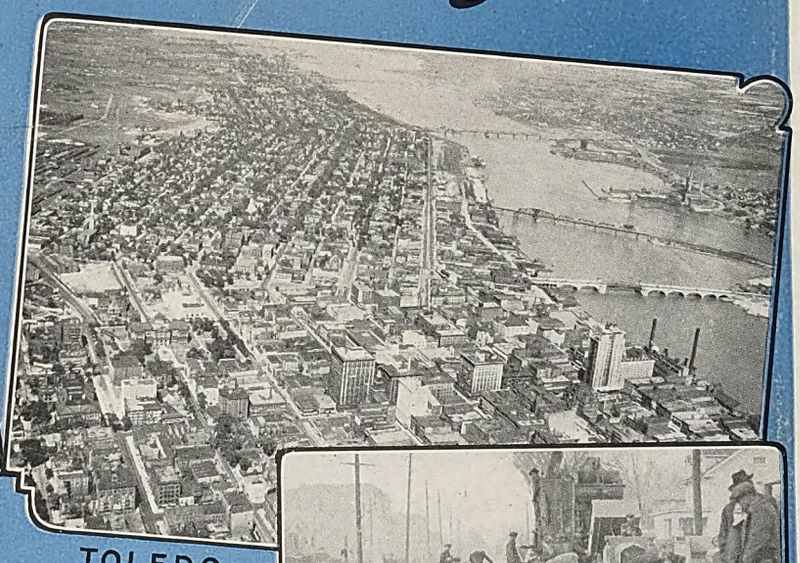
Steel Twin Tie Track on representative and prosperous railways

DETROIT



TOLEDO

Steel Twin Tie Track, Detroit, Mich

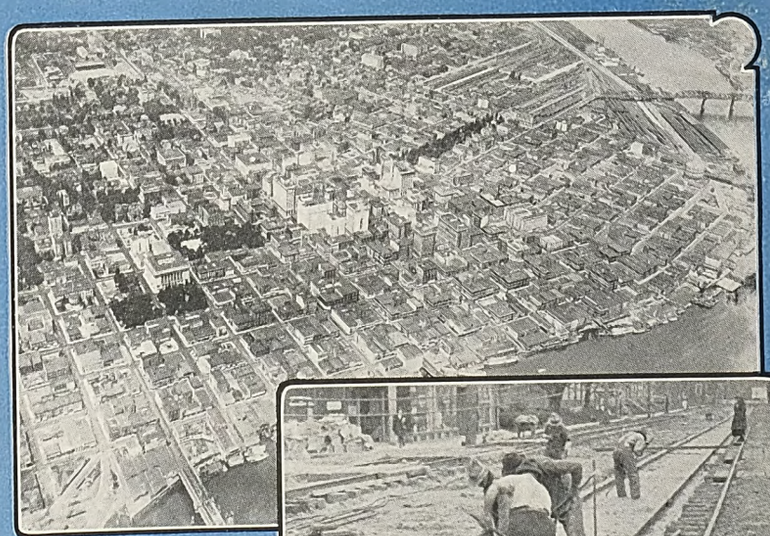
Big Mileage *in* Big Cities

Steel Twin Tie Track, Toledo, Ohio.

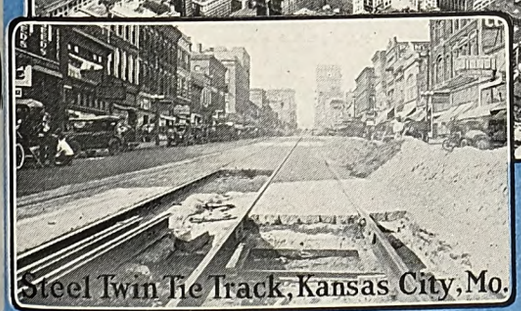
The best evidence of the quality Steel Twin Tie Construction is in our list of users and in their records.

May we suggest you designate one of your organization to investigate Steel Twin Ties and report?

KANSAS CITY



PORTLAND



Steel Twin Tie Track, Kansas City, Mo.

The International Steel Tie Company
Cleveland, O.

Steel Twin Tie Track, Portland, Ore.

Steel Twin Tie Track

Renewable Track . . Permanent Foundation

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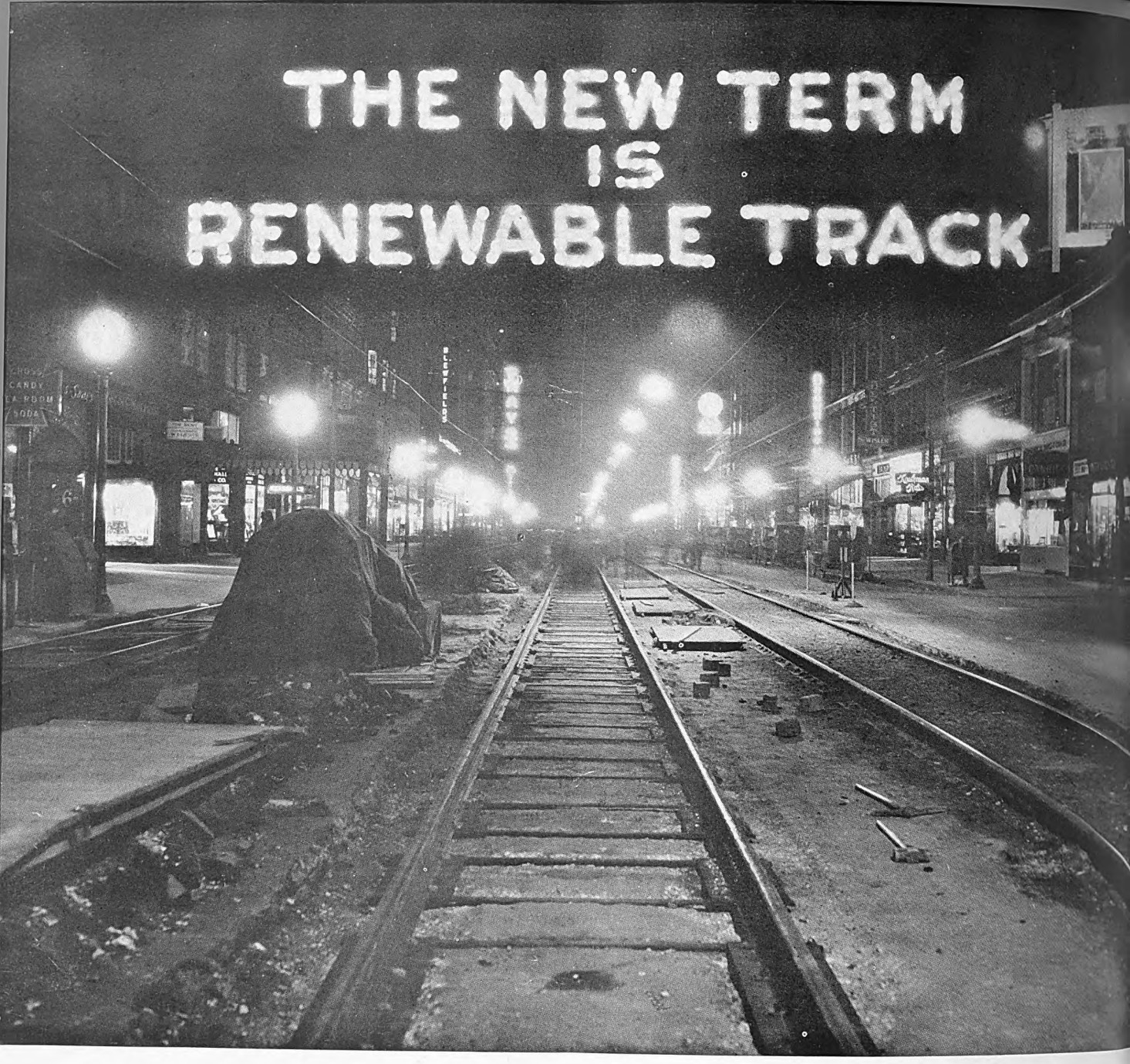

A New Standard for Performance for Paved Track Construction

IN the past two years a new standard of performance for paved street track construction has been set by Steel Twin Tie Track. Several installations are *now older* than the rail they are carrying.

Passing over the original installation illustrated here some 45,000,000 car wheels wore the rail head to a point which necessitated renewal. But the foundation of concrete and steel ties was found in perfect condition.

The renewal methods and design for initial installation are described in detail in our new catalog. May we send it to you with a quotation on ties to your point of delivery.

The International Steel Tie Company, Cleveland, Ohio

Steel Twin Tie Track

Renewable Track . . Permanent Foundation

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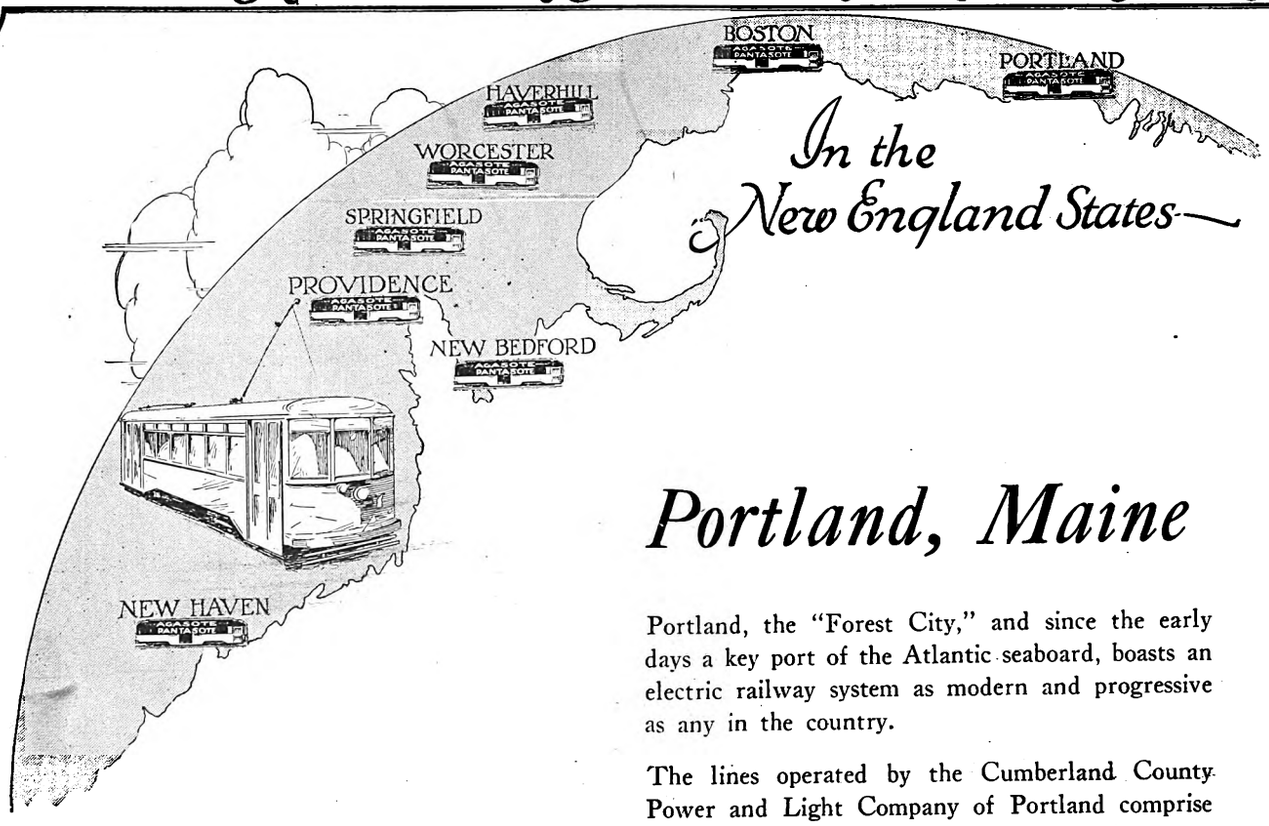
Covering the country with Pantasote and Agasote



Portland, Maine

Portland, the "Forest City," and since the early days a key port of the Atlantic seaboard, boasts an electric railway system as modern and progressive as any in the country.

The lines operated by the Cumberland County Power and Light Company of Portland comprise both city and suburban services aggregating some 105 miles of trackage. And in company with the majority of well-established operators they have from the first consistently specified Pantasote and Agasote.

Judged on the sound basis of proved last cost economy Pantasote Products become a logical choice. The fact that they almost invariably last for the life of the car, through storm and shine, heat and cold, compensates many times for their slight extra cost. More than a quarter century of practical proof stands back of the facts that Pantasote curtains and seats will not crack, harden or flake and that Agasote headlinings, roofs, wainscotings, etc. are virtually indestructible.

Specify Pantasote and Agasote. Insist upon getting them for new cars, for rehabilitation. In the end it always pays!

Next week we will take you to the Middle West where Pantasote and Agasote have grown up with the electric railway industry and are now almost exclusively specified.

Pantasote Products would not be so universally used unless Economy prevailed after all!

Specify them for your buses also!

Warning!

There is no substitute for Pantasote

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Behind the Bus—Efficient Terminal Buildings

TEN vital questions must be answered before you start your new bus terminal.

The Austin Company has prepared a special folder on motor bus terminals, from its large fund of experience already gathered in this comparatively new field. It is designed to help the executive who is approaching the subject of building better terminal facilities to back up the buses.

Austin's experience in the design and construction of bus terminals is backed by many years' experience in the economical design and efficient layout of railroad and industrial buildings.

Housing and maintaining buses at a minimum capital expense to obtain a maximum return, is the direct result of the well known Austin Method applied to this problem. The good-results obtained from Austin-built terminals are a matter of record, and constitute the real reason why Austin is now busy constructing motor bus terminals throughout the country.

Wire, phone the nearest office in Austin's nation-wide organization, or send the coupon for your copy of "FACTS about the Design and Construction of Motor Bus Terminals."

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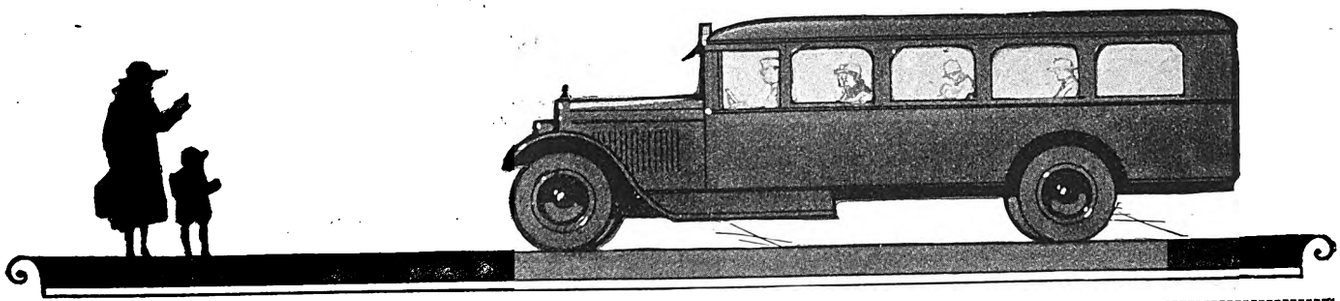
New York Cleveland Pittsburgh St. Louis Chicago Philadelphia Seattle Portland Detroit Birmingham Kansas City
The Austin Company of California: Los Angeles and San Francisco. The Austin Company of Texas: Dallas.



AUSTIN

FINANCE • DESIGN • CONSTRUCTION • EQUIPMENT

The Austin Company,
Cleveland.

Please send "FACTS About the Design and Construction of Motor Bus Terminals" to

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Individual .....

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Appointments help make the *20th Century the wonder train!*

Speed, of course, identifies the 20th Century Limited as the crack train of the New York Central, but its reputation also is built on appointments contributing to passenger comfort and convenience.

It is much the same with the modern motor bus. Mechanical engineering features of chassis design must be supported by appointments contributing to passenger comfort—and this means the *body*.

Lang Bodies, in design and workmanship, have established the standard in body building—for quality and for improvements. Quality once attained must be maintained.

Backed by 48 years of experience, equipped to execute quality work and keenly alert to every development in the bus industry, the Lang organization is exerting a widespread influence in motor coach design, just as years ago it set the standard for fine carriage building.

"Bodies by Lang" is a recommendation founded on supremacy.

We extend a most cordial invitation to come to the Lang Body plant and inspect the latest models in body design at every stage in their construction.

LANG BODIES

Miles of Smiles
for Rider for Driver for Owner

A Body for every chassis
Deluxe Sedan
Parlor Car and
Street car
Types

THE LANG BODY COMPANY · CLEVELAND · O.

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Meeting the Responsibility of a New Age of Transportation

ALONG with all the opportunity for profit in the rapid expansion of bus transportation, the farsighted bus operator realizes his responsibility in hastening its success.

He knows that the public must be made to look on this modern method of travel as a safe, prompt, dependable service.

He gives careful consideration to the tires that determine to a great degree the reputation of his bus service.

It is natural that bus operators are attracted to the U. S. Royal Cord Bus-Truck Tire as the ideal tire for their particular needs.

Here is a tire that U. S. Rubber Company engineers have developed after years of careful study of just what bus service demands.

The Royal Cord Bus-Truck Tire was the first pneumatic *specifically* designed for bus service. The first to carry the word "Bus" on the tire.

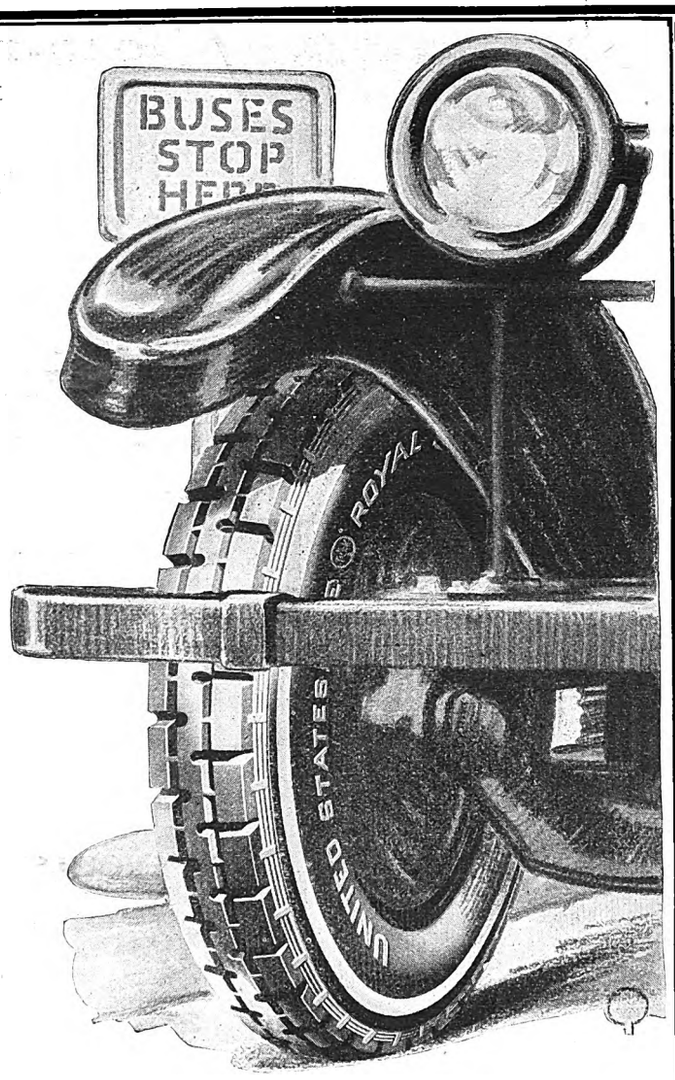
Through the invention of Latex-treated Web Cord, this tire has a construction advantage that has established its leadership.

This construction, patented and owned by the U. S. Rubber Company, gives a combination of strength and flexibility that is essential to long-service cushioning in bus tires.

The special adaptation of the famous Royal Cord tread affords traction and safety that make operation more economical and handling more certain.

You owe it to yourself, your customers and the future of bus transportation to get the superior service of U. S. Royal Cord Bus-Truck Tires.

United States Rubber Company

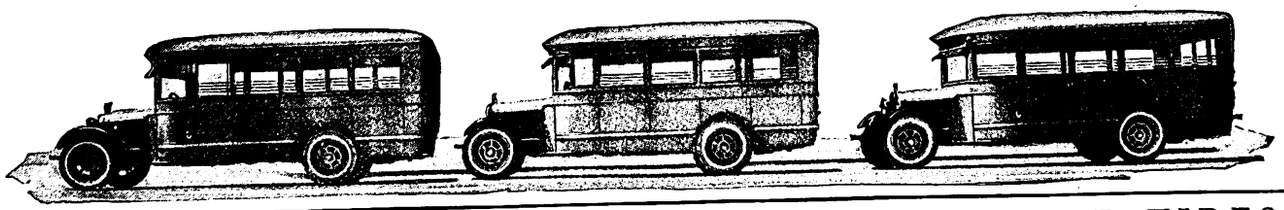


Getting at the Real Facts

In order to have a complete understanding of all the facts concerning bus operation, the United States Rubber Company maintains groups of tire experts in every part of the country. They are making a day-to-day study of bus operation in their respective localities. Their reports are the basis on which information is made available to bus operators to help them get the best service from their tire equipment.

Trade US Mark

These Graham Brothers Buses, operated by the Texas Electric Railway Co., are fully equipped with U. S. Royal Cord Bus-Truck Tires.



UNITED STATES BUS-TRUCK TIRES ARE GOOD TIRES

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GAS-ELECTRIC DRIVE MEANS

When other buses have reached the end—

—yours will still be good for many years. Freed from the vibration of an over-speeding engine—without the recurring shocks of clutch engagements and gear shifts—entire bus equipment and body are assured much longer life by

Gas-Electric Drive

(for buses and trucks)

Before you buy buses consult the General Electric Company regarding your service and grade conditions.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

GENERAL

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LOWER COST FOR BETTER TRANSPORTATION

MAINTENANCE and depreciation allowances mean much more in bus costs than do gasoline, oil and tires. Many owners of buses—and automobiles—fail to realize that until it is too late.

Bus operators have been startled to find that three to five years spell the end of the average bus. What more can be expected of any equipment shaken with vibration, and strained by thousands of gear shifts per day!

Gas-Electric Drive has changed all this. Smooth and fast, quiet and powerful, strong and highly efficient, it offers real economies in bus transportation, unattainable by mechanical drives.

Maintenance Advantages

Inspection and testing of engine are simplified, made systematic and conclusive.

Engine cannot be raced or stalled and average engine speed is lower—prolonging life of bearings, pistons, cams and all other moving parts.

Clutch, gears and differential—all subject to high maintenance—are eliminated.

Without the shock of gear changing, the life of engine, chassis and body is longer.

Uniform torque of electric drive means less tire wear.

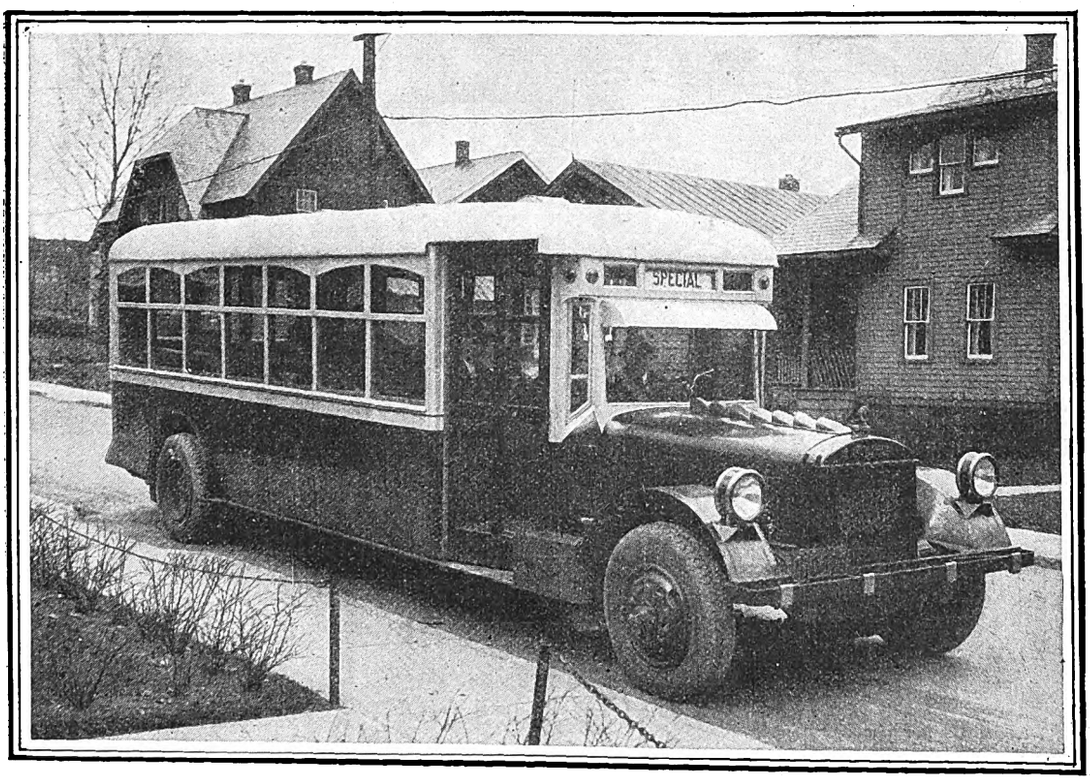
Engine lubrication is materially less.

Operating Advantages

Greater riding comfort—no vibration or jerks during starting, and smooth acceleration.

Increased safety—control entirely in foot pedal relieves operator's hands for steering—skidding is minimized by individual drive on rear wheels—engine cannot stall on dangerous crossings.

Higher schedule speeds—through more rapid acceleration and reduction of driver fatigue—affording lower costs and higher receipts.



11-13

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"Standardize on good material—then stick to it—by your book"

For years this has been our advice to those charged with the upkeep of railway equipment.

Why? Because only renewal parts of "original equipment quality" can keep G-E Car Equipment working at its best. And that is why General Electric has a double responsibility in building the utmost service into G-E Renewal Parts.

You select your equipment with care. Don't endanger its performance with repair parts selected at random.

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GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N.Y., SALES OFFICES IN ALL LARGE CITIES

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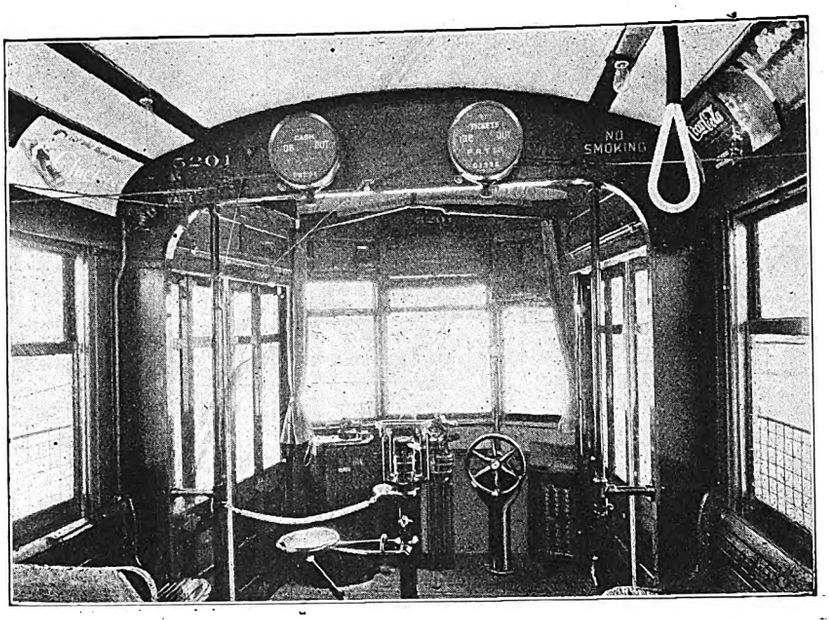
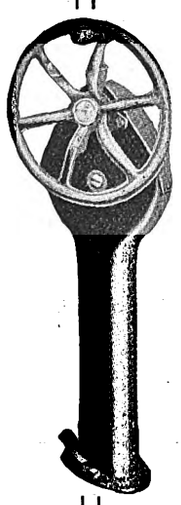
The Supreme Test!



Peacock Staffless Brakes

No doubt all your cars are equipped with auxiliary hand brakes—How do they stand up? Will they stop the cars under the most adverse conditions? That's the test.

The Peacock Staffless



For more than twenty years Peacock Brakes have stood for the Supreme Test—a few swift turns of the hand wheel and the sure grip of the Peacock Brakes take hold with the maximum braking power—a retarding grip which is more effective than spinning wheels backward with reversed motors. The BRAKING POWER of the Peacock is at least three times as powerful as any ordinary type hand brake.

The significant fact that by far the largest percentage of all new cars are equipped with Peacock proves that they have stood the test of service.

Send for full details of this high-grade hand brake.

Write today for full information

NATIONAL BRAKE COMPANY
890 Ellicott Square
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Manganese Brake Heads
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Manganese Body Bushings
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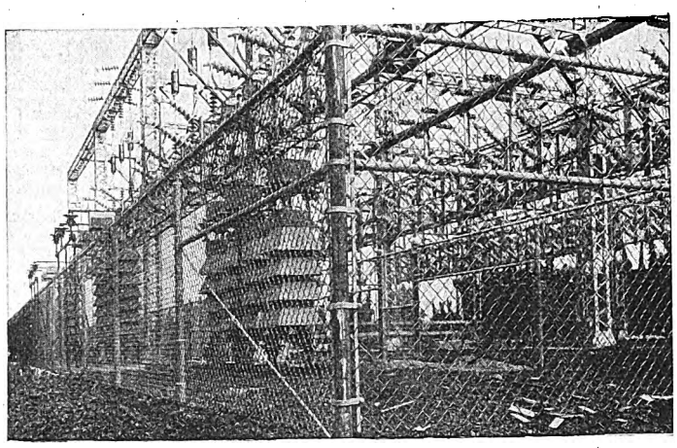
Bemis Pins are absolutely smooth and true in diameter. We carry 40 different sizes of case hardened pins in stock. Samples furnished. Write for full data.
Bemis Car Truck Co., Springfield, Mass.

Standardize on PAGE substation *and* transformer protection—



—permanent, sightly, *and costs less*—

You'll have all stations fenced alike which will simplify ordering and reduce erection costs. Removable Page panels, fitting into concrete set sleeves, make wide expensive gates unnecessary for replacement of transformers on other equipment.

Page Fence will last longer—it's the strongest type of woven fence made. Our galvanizing-after-weaving process produces a zinc coat practically 5 times heavier than on ordinary fence wire. And it's easy to erect—experienced crews will do this for you—or we can supply trained foremen to direct your own labor.

Send for Book on Substation Fencing

This will show you how others are saving money for standardizing on Page—what types of fence are used—how Page conforms to uneven ground. Mail the coupon for a copy—it's free.

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215 N. Michigan Avenue, Dept. 56, Chicago, Ill.

AN ASSOCIATE COMPANY OF AMERICAN CHAIN COMPANY, Inc. in business for your safety

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Please send me your free book on PAGE Substation Fencing and other data of interest.

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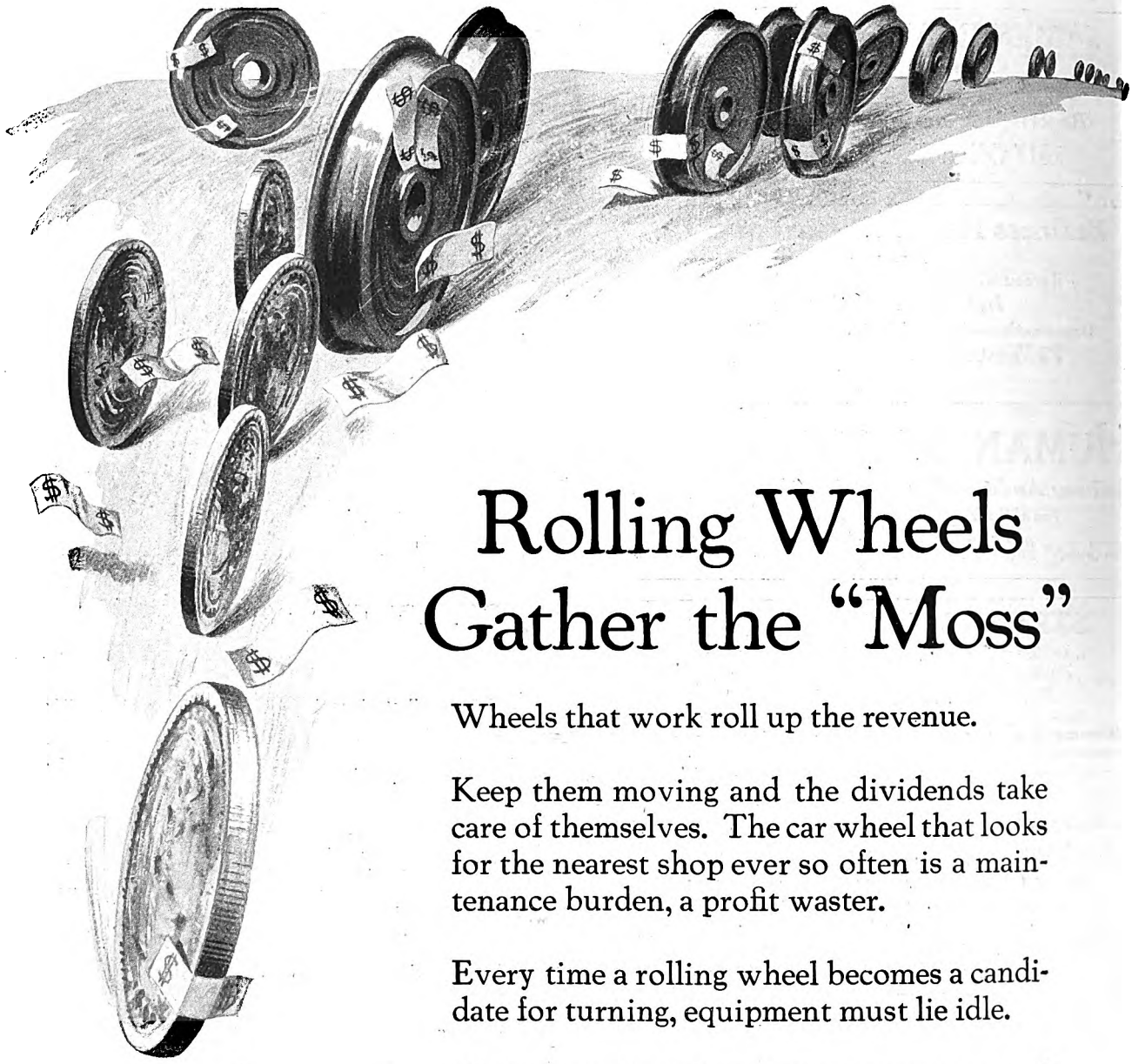

Rolling Wheels Gather the "Moss"

Wheels that work roll up the revenue.

Keep them moving and the dividends take care of themselves. The car wheel that looks for the nearest shop ever so often is a maintenance burden, a profit waster.

Every time a rolling wheel becomes a candidate for turning, equipment must lie idle.

This waste of good equipment can be stopped by using Davis "One Wear" Steel Wheels. These give equal strength, more mileage and stay in service during their entire life.

Ask us to show you why the Davis "One Wear" Steel Wheel is the logical solution to that wheel problem.

AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

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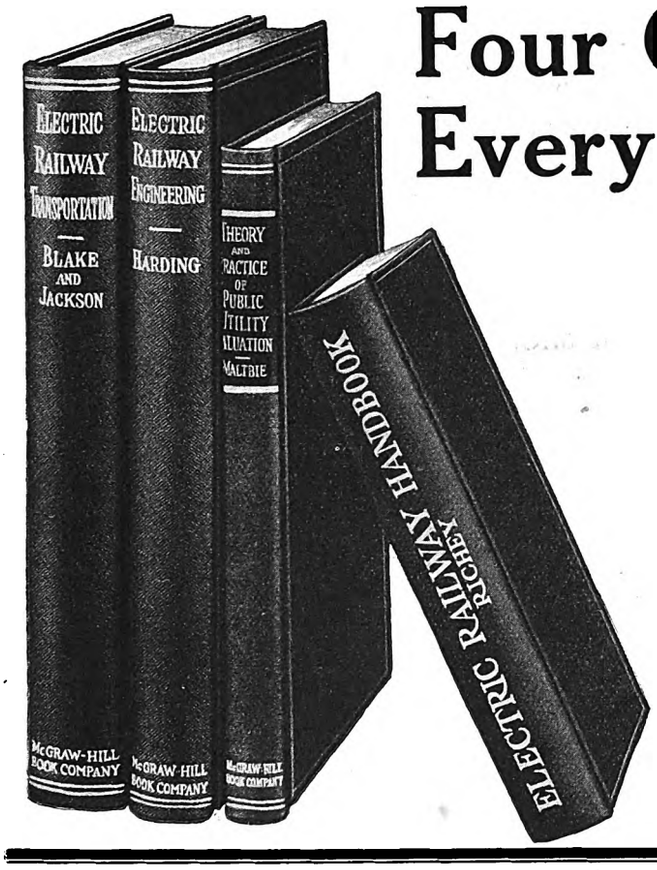

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Out of the thousands of books published for each field of industry, four or five (often more) usually stand out as those with which the particular industry's executives should be familiar—should know—and should use.

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These four books give the latest reliable electric railway information you need, derived from the actual experience of practical electric railway engineering men. The library contains no far-fetched suggestions—practical usefulness is its keynote. It points out ways and means of increasing efficiency and lowering costs which other engineers have found successful. You can apply these methods to your every-day problems. You can make this information count for you in actual dollars and cents of better results. The library will more than pay for itself. It is a set of four books every electric railway company should have.

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Blake and Jackson's ELECTRIC RAILWAY TRANSPORTATION takes up problems of getting the cars over the tracks, increasing traffic, collecting fares, etc. It has much valuable information on the motor bus. It is right up to the minute in its new second edition.

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The complete electric railway reference

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What a European Manager Thinks of a New American Book

If this book is so valuable to a leading foreign manager whose practice is so different, it should be even more valuable to the American electric railway operator.

The following excerpts are from a signed review of the new edition of Blake and Jackson's "Electric Railway Transportation". It was contributed by Mr. William Stein, Regierungsbaumeister a. D., and managing director of the Hamburg Elevated Railway. It was published in the issue of "Verkehrstechnik" for May 22, 1925.

"The first edition of this book appeared in 1917 but hardly became known in Europe because of the war. The new edition deserves special attention because it offers a book which is unique of its kind. There are many books in which the technical features of the operation of electric railways are considered. Here is one which is concerned directly with the business of transportation itself—namely the experience and science of the operating manager. The material is treated from many sides but so thoroughly and skillfully that the book may well be called a model in the combination of useful facts.

"Naturally, the discussions of electric railway operation are treated primarily from the American standpoint. Nevertheless, there are references to European experience, though not in extenso. Whoever wants to learn about American railway practice and whoever realizes that the conditions as they exist over there, prevail to a greater or less extent also on this side of the ocean, ought to study this book thoroughly.

"The first subject considered is the organization of the transportation department or the relations between the various transportation officers and their functions, as developed on small and large systems. The authors especially emphasize the need for close relations between the transportation department and those connected with the technical side of the service. In this connection, the reader will learn that the American Electric Railway Association has compiled an extensive list of technical terms connected with electric railway operation and has carefully defined them, so that throughout the country the same terms have the same meanings in all circumstances. For example, zone systems are classified in four divisions, while here we recognize only one, although we have like varieties.

"Further on, there is a discussion of the methods of checking and tabulating traffic statistics, this section being aided by many significant data, diagrams and illustrations which are explanatory of the noteworthy methods employed. Since the traffic in American cities has greater hourly fluctuations than are customary in Europe and since there is need of providing skilfully for this traffic, such as from great plants like the Ford Motor Works, especial attention has to be paid to any means that will modify the peaks. Further on, in the discussion on fares, the matter of flat fares and various forms commutation tickets and passes is considered. An American Zone fare practice worth attention is that of issuing zone checks on pay-leave operation.

"The most valuable part of the book, however, is that in which new types of cars and the methods of collecting fares are discussed. While these are entirely different from those in Europe, they have been developed to great efficiency. These two matters—the collection of fares and the design of cars—are closely related, because the conductor remains in a definite place where he can undertake any duties that are likely to arise in operation. These different conditions including one-man operation, have never been set forth so comprehensively and so clearly as in the book mentioned. A study of this chapter is, therefore, very much worth while.

"The courteous handling of the passengers on the car, destination signs, publicity and schedules are also well treated as is also the question of the relation between the street railway and the bus. The field of the bus is seen to be much the same as with us. One peculiarity of the American car-bus problem, however, is the large number and extent of low traffic density interurbans. Some of these lines have actually been taken up and their services replaced by the motor-bus.

"The reader can also learn much about the handling of the personnel, which differs widely from our practices. For example, rotation of runs among the men operating from a depot is rare, the usual practice being to assign the runs to the same men regularly on a seniority basis. Much information is also given in this connection on methods of discipline, mutual benefit associations and employee welfare work—in all of which the practice differs notably from that in Europe.

"All in all, the book contains so much that is very worth while that there should be a copy in the library of every street railway system."

This book was written by Henry W. Blake, senior editor *Electric Railway Journal*, and Walter Jackson, fare and bus consultant. It is a complete guide to the best modern electric railway transportation practice. It contains 437 pages and 121 illustrations. The price of the book alone is $5.00.

Special Combination Offer, Good for New or Renewal Subscriptions, of $7.00.

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BROOKLYN buys again!

THE policy of modernizing its equipment adopted by The Brooklyn City Railroad is being extended by the purchase of 335 new front-entrance Pay-as-You-Pass center-exit cars.

These cars are now being received and placed in service. Together with the two hundred of the same type which began operation during the Fall of 1923 they enable this company to render better service to its car riders, and secure reductions in maintenance and operating costs.

Designed for rapid acceleration and retardation and shorter duration of stops, these cars afford increased scheduled speed, producing more car miles per car hour and permitting a better "merchandising of transportation."

E. E. Morgan

Vice-President and General Manager
The Brooklyn City Railroad Company

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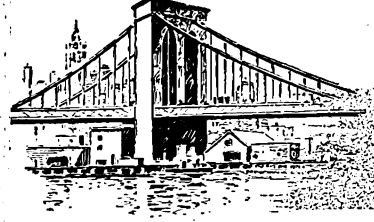
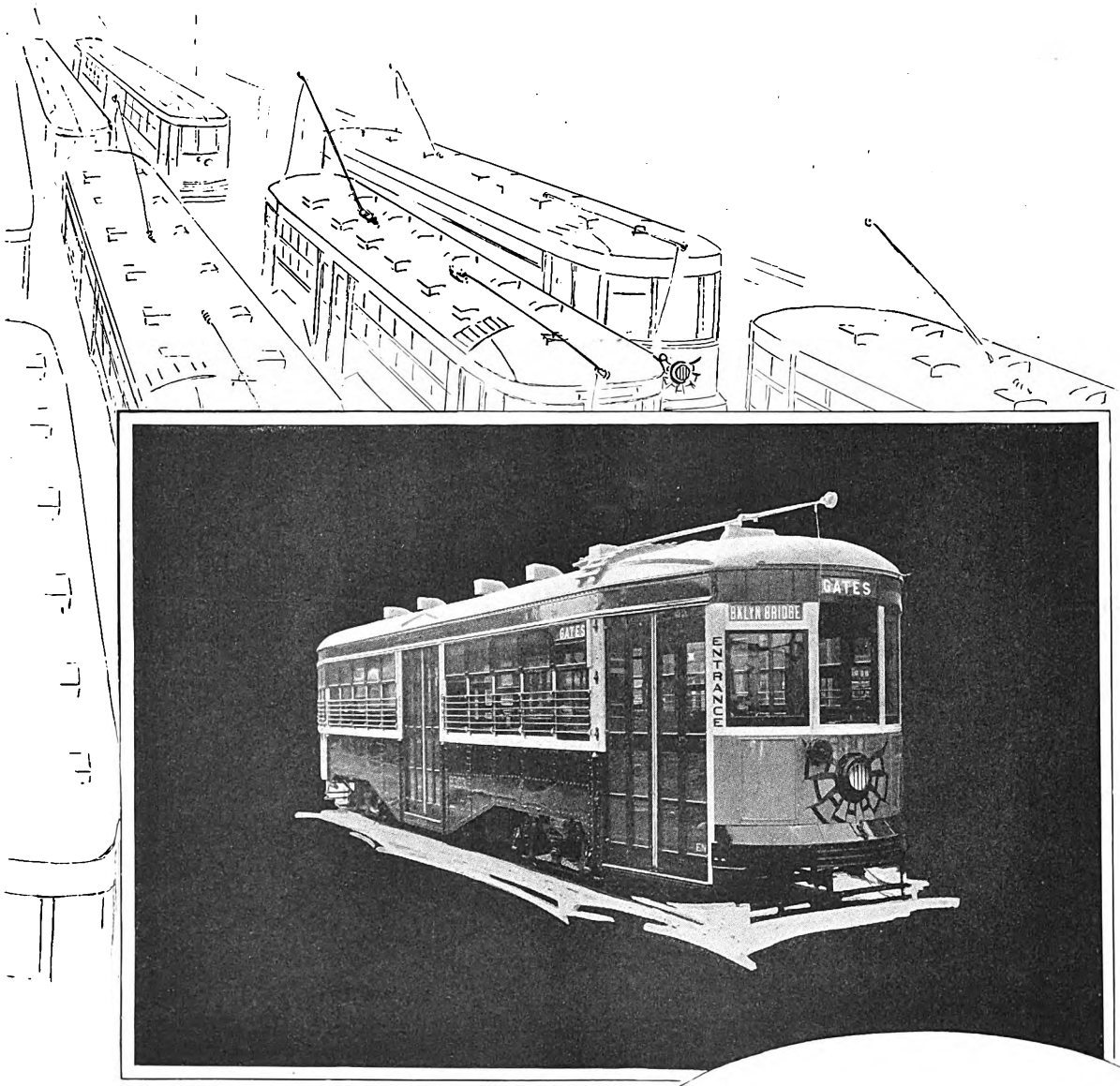
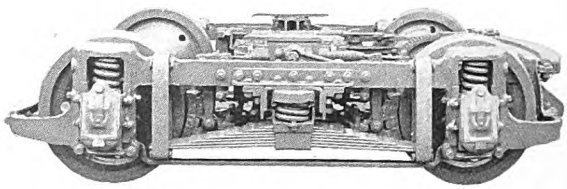


Modern Cars Build Busine

Leader





150 Cars
620 Trucks
"BRILL"

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for Brooklyn City Railway

amongst leaders!

BRILL CARS
and Trucks
for the Brooklyn City Railroad~

Brill Cars and Trucks have been the choice of the foremost electric railways for years.

Once again! when the Brooklyn City Railway placed its order for 150 cars and 620 trucks with The J. G. Brill Company, Brill-built cars and trucks justified their reputation gained thru years of service.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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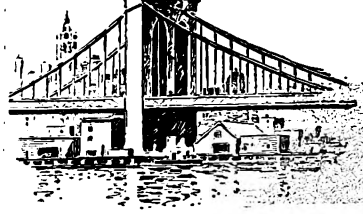
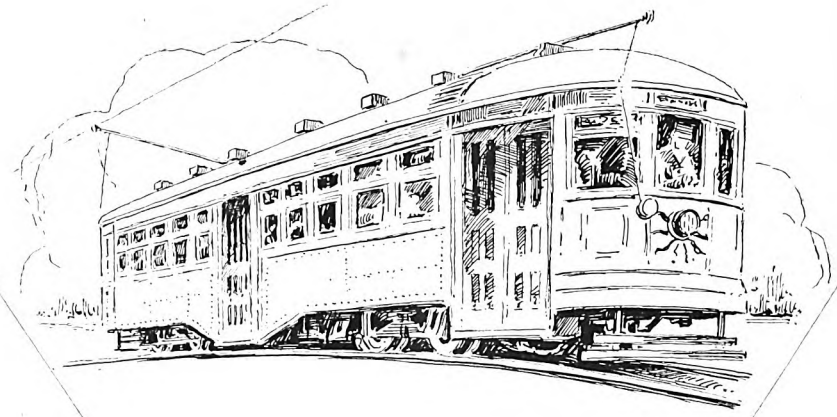


Attractiveness, Speed and Econo

Sure-fire Safety—at least upkeep cost

On all of Brooklyn City's new cars, Root Steel Spring Life Guards are a standard specification.



FOUR sound reasons stand back of Brooklyn's choice. They are well worth your careful consideration.

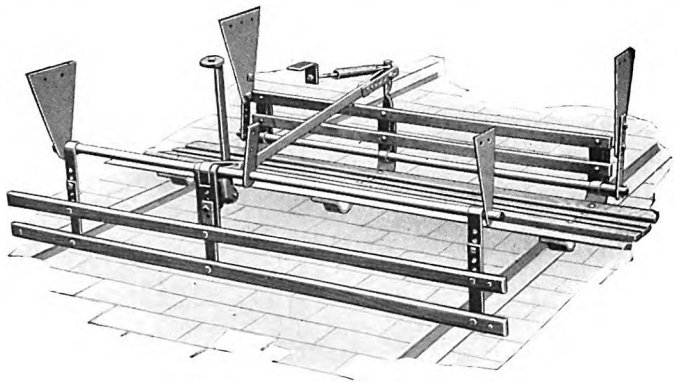
(1) The Root Spring Life Guard is essentially simple and easy of installation.

(2) Having no intricate mechanisms, and being made of the highest grade materials, in weights and sections amply large for the service, upkeep is practically negligible.

(3) It cannot possibly slip down accidentally, and when down can be reset by the motorman from his platform.

(4) It is all that the name signifies — A LIFE GUARD. No object can get through or under the guard when down.

Write us for further details of this and other Root Spring Specialties.



The ROOT STEEL SPRING LIFE GUARD

Root Spring Scraper Co.

Kalamazoo, Mich.

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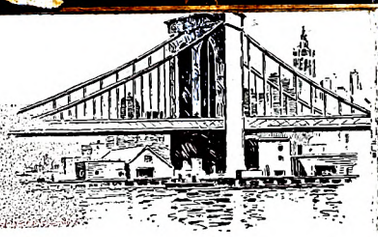
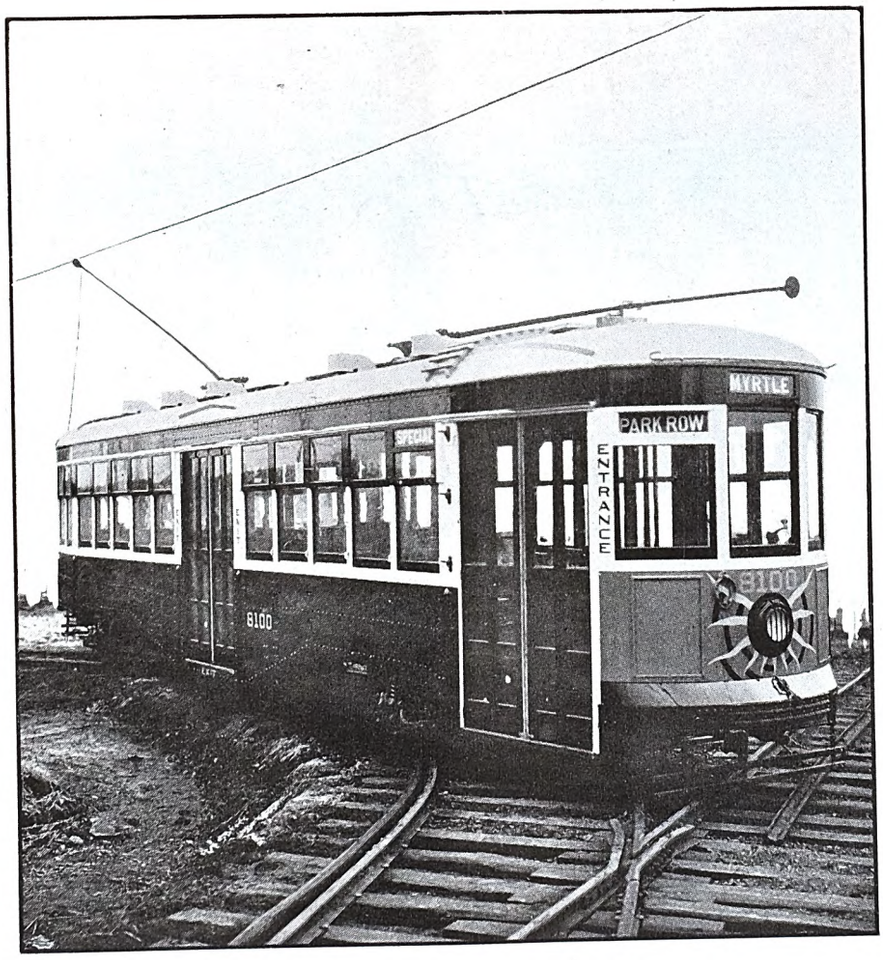
Earn Greater Net Revenue in Brooklyn



100 more "Quality" Cars for Brooklyn



A repeat order for the cars
And a repeat for St. Louis seats

St. Louis Car Co.'s Latest Improved Equalized E. D. J.-64 Trucks

Ordered For Twenty Five Of These Cars

Two years ago the first hundred "Quality" cars were shipped to the Brooklyn City R.R. Their performance and stand-up qualities earned them that recognition which brought the order for the second hundred now. *"Quality" tells.*

St. Louis Car Company

St. Louis, Mo.

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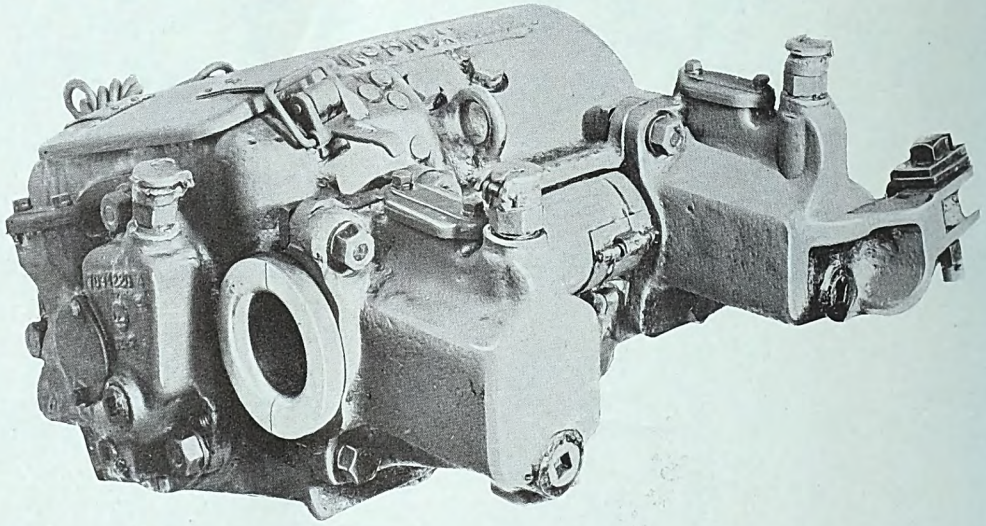
Shorter Running Time with Modern Cars

Motors! Westinghouse 510-A's (4 per car)

Away!



For *all* these latest cars!

Judged from the standpoint of experience—in operation and maintenance—Westinghouse motors have successfully met the exacting requirements in Brooklyn.

Westinghouse No. 510 A motors, being especially adapted for modern city service, where high acceleration plus fast free-running speed is essential, have been selected for all the 335 additional new cars.

WESTINGHOUSE ELECTRIC

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA 1925

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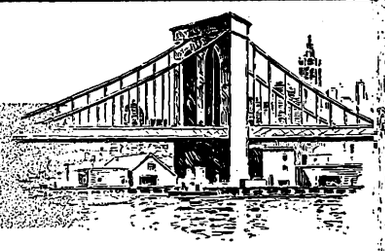


— Ahead of all the other traffic !

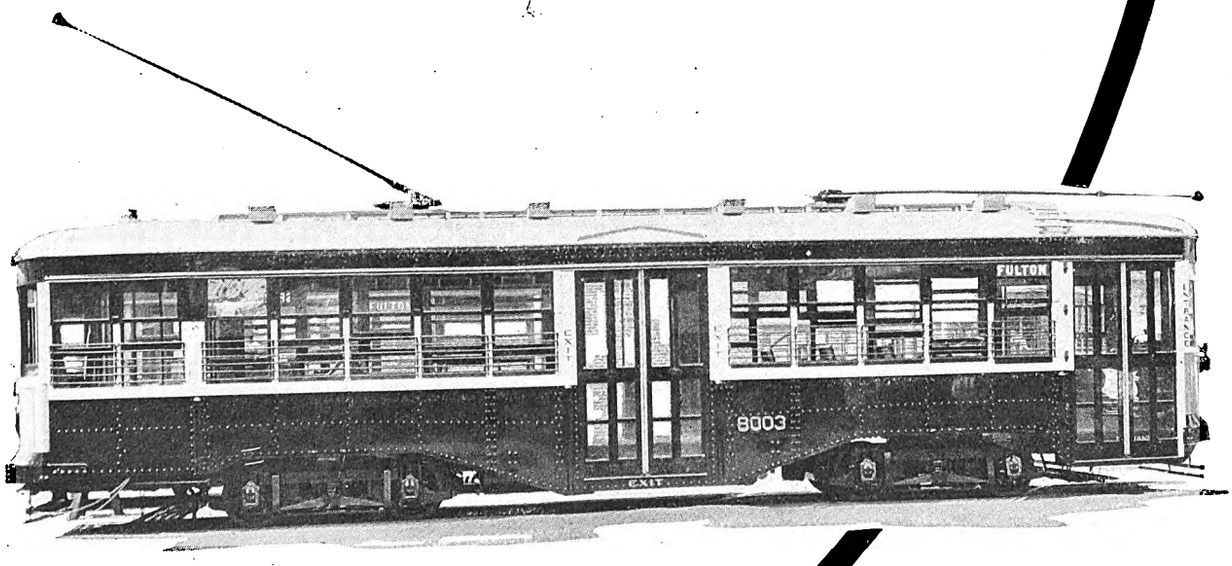
The street car leads in Brooklyn by superior speed and acceleration

Automobiles, taxis, trucks — they all *trail* these whizzing cars that the Brooklyn City Railroad uses. They simply can't get by 'em on the runs from corner to corner. Faster in accelerating, these cars also reach and maintain a speed between stops that frustrates even the wildest of taxi-men.

Running times have been reduced by several minutes and the leadership of the street car as the basic means of urban transportation has been re-established.

More and better-satisfied patrons, increased revenue and decreased expenses — these have been the fruits of the first 200 cars, fruits which have led the management to order 335 more,— all Westinghouse-equipped.

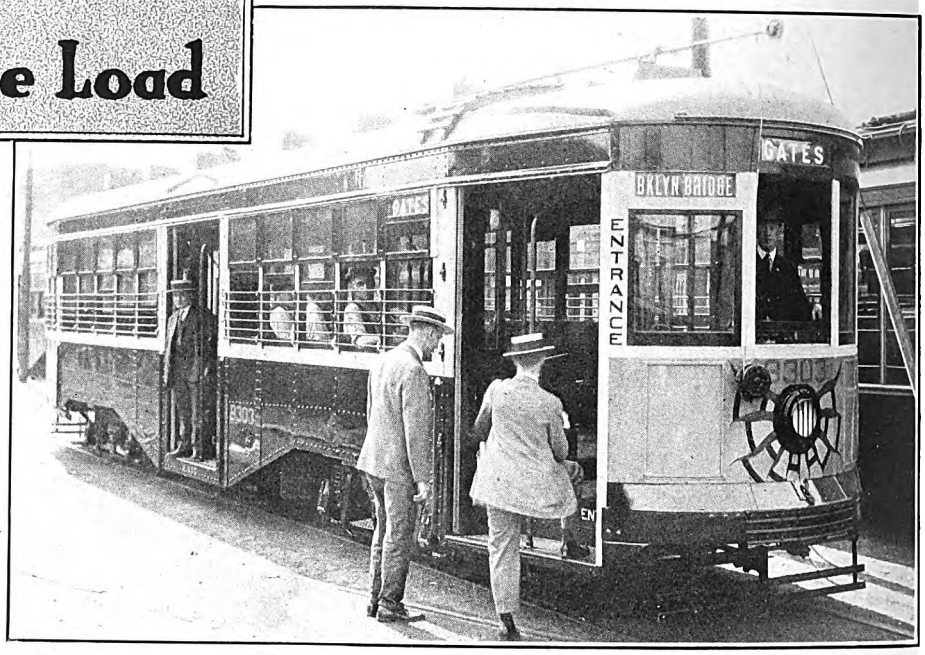
Are there similar possibilities on your road? Let our engineers assist you in the investigation.



Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Quick Getaway and Effective Brak

BRAKES! Variable Load



Speeding Up City Traffic

EVEN fractions of a second count in shortening runs like those in Brooklyn where stops are frequent. The Variable Load Brake provides a retarding force which automatically adjusts itself to the car loading so that stopping distances are uniform. This reduces the average time consumed in stopping and cuts down the running time between stops, by permitting longer peak-speed operation. A general speeding up of service is the result.

Westinghouse Variable Load Brakes "made good" on the first 200 Brooklyn cars, and they are being used on the new cars, making a total of 535 equipments. All of these cars have DH-16 Compressors—the well-known Bungalow type.

Westinghouse Traction Brake Co.
General Office and Works, Wilmerding, Pa.

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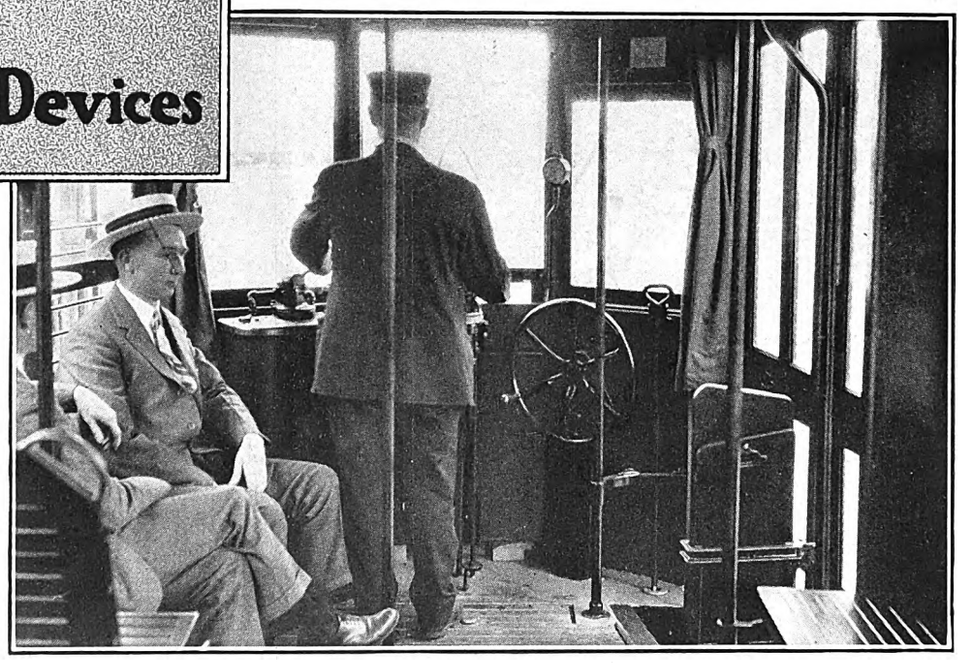
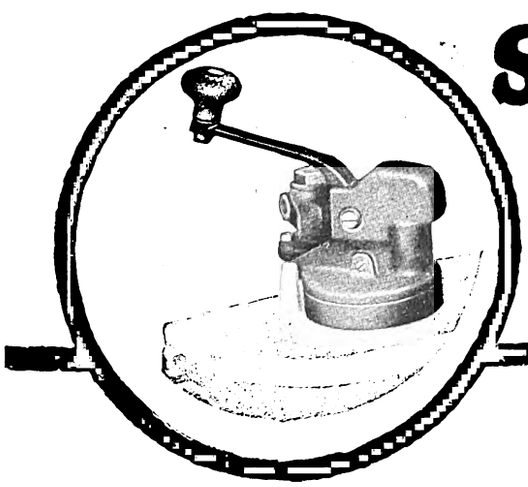
Control! Safety Car Devices



Safeguarding City Traffic

INTERLOCKING of car control, brakes, doors and steps, by means of the Safety Car Control Equipment, prevents door opening before the stop is completed, and likewise prevents a start before the doors are closed. This feature also causes automatic cutting off of current and emergency brake application if the operator releases the controller handle through carelessness or disability.

Brooklyn tried out the Safety Car Devices on the first 200 cars with entire satisfaction, and they are being used on the 335 new cars. Over 400 other traction properties are realizing the benefits derived from using Safety Car Control Equipments.



SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.

Postal and Telegraphic Address:
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CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

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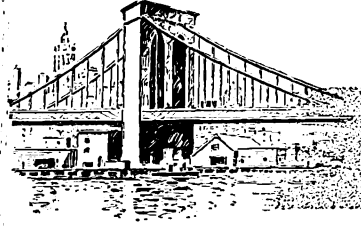
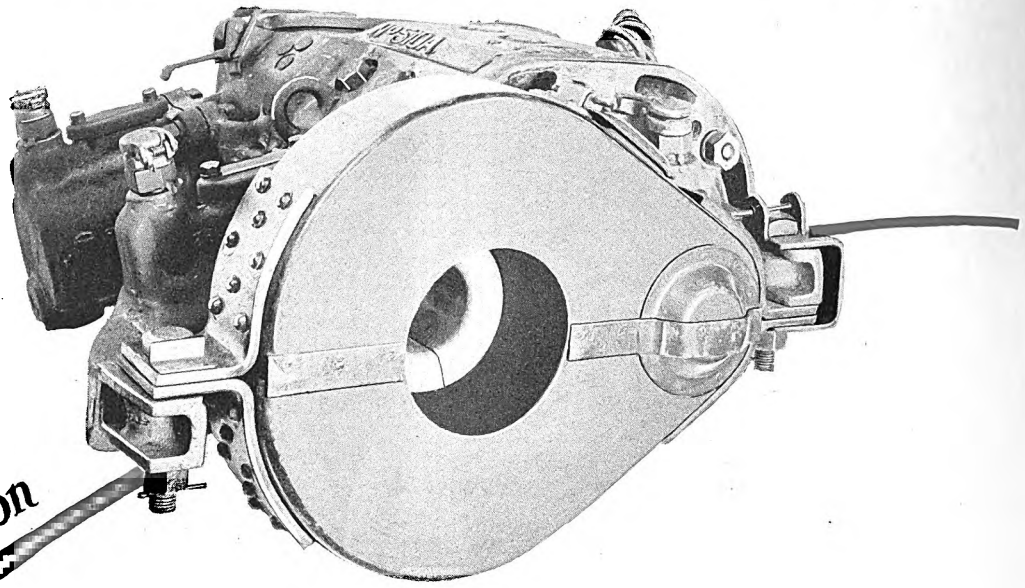


Modern Cars Scientifically Design

For lightness—strength—low maintenance



Brooklyn's Specification

1340

Chillingworth

Drawn Steel Seamless

Gear Cases

Applied to W. H. 510 A Motors

To start with—The price and weight of this Gear Case are less than Malleable Iron, and stronger than built-up steel cases.

Then again—Tough, flexible drawn steel is not so liable to serious breakage,—gives your gears utmost protection.

Repairs are less expensive because seamless steel is more easily welded and riveted than iron.

The one-piece construction of Chillingworth Gear Cases with *overlapping* joint between the two halves absolutely prevents the entry of dust or the escape of grease. There are no seams to open up.

Expensive gears are entitled to this 100% protection for utmost economy in operation.

Chillingworth Manufacturing Co.

JERSEY CITY, N. J.

Sold in Canada by
RAILWAY & POWER ENG. CORP.
Toronto Montreal Winnipeg

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H. F. KEEGAN & Co., Chicago
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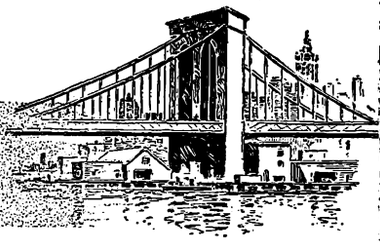
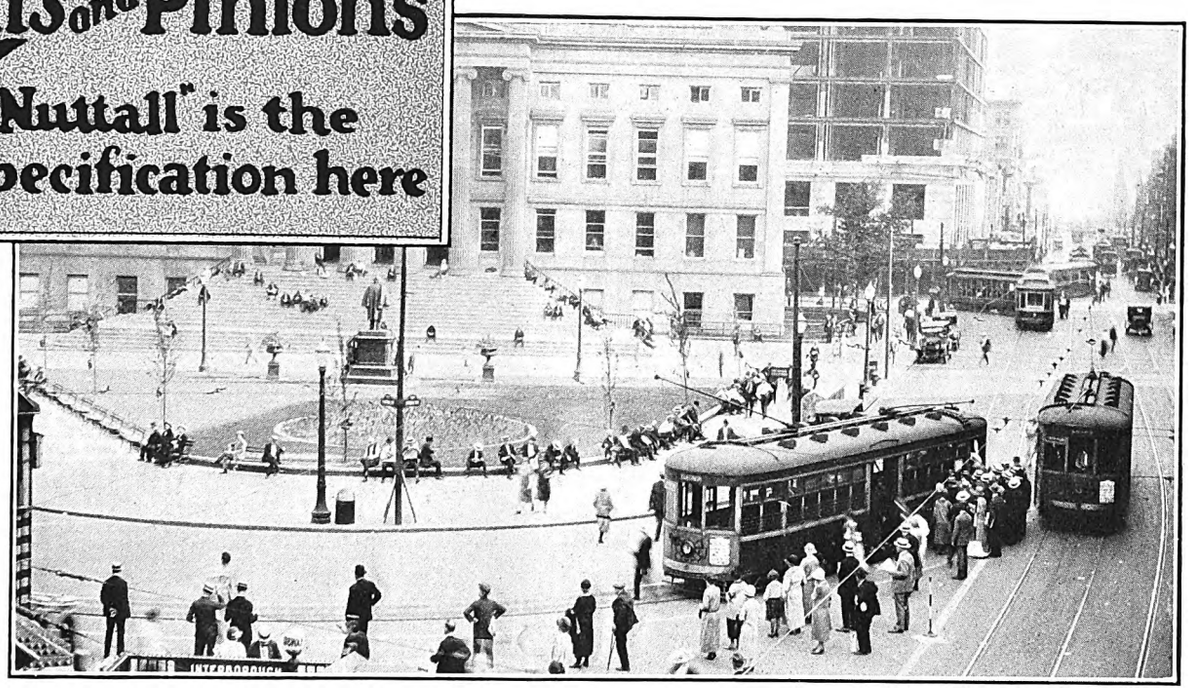


Gears and Pinions

"Nuttall" is the specification here



Drive 'em!

Off with a flying start — whizzing to the next corner — stop 'em, start 'em, drive 'em — that's the way they beat the autos!

Underneath the car, where the driving is done — what's there, to stand this gaff?

"Nuttall" BP gears and pinions! Naturally they're "Nuttall", because that's where railway men turn for "tough-hard", quiet-running gears.

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

MEMBER AMERICAN ELECTRIC RAILWAY ASSOCIATION AERA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Nuttall

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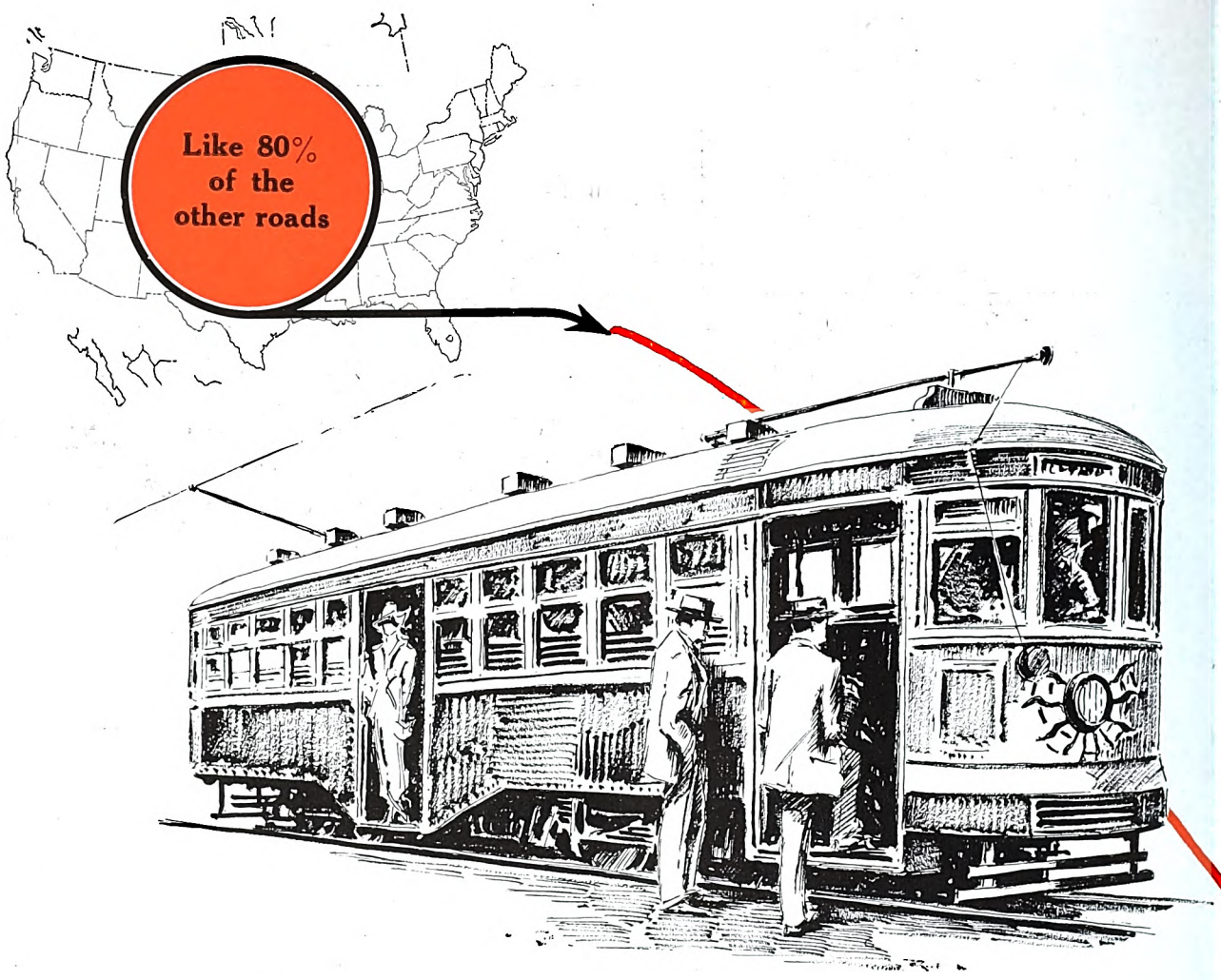
Modern Cars Build Business



150 of these new cars are equipped with National Pneumatic door control

Go through the specifications of practically any new car order and you'll find that they call for National Pneumatic Door and Step Operating equipment.

NATIONAL

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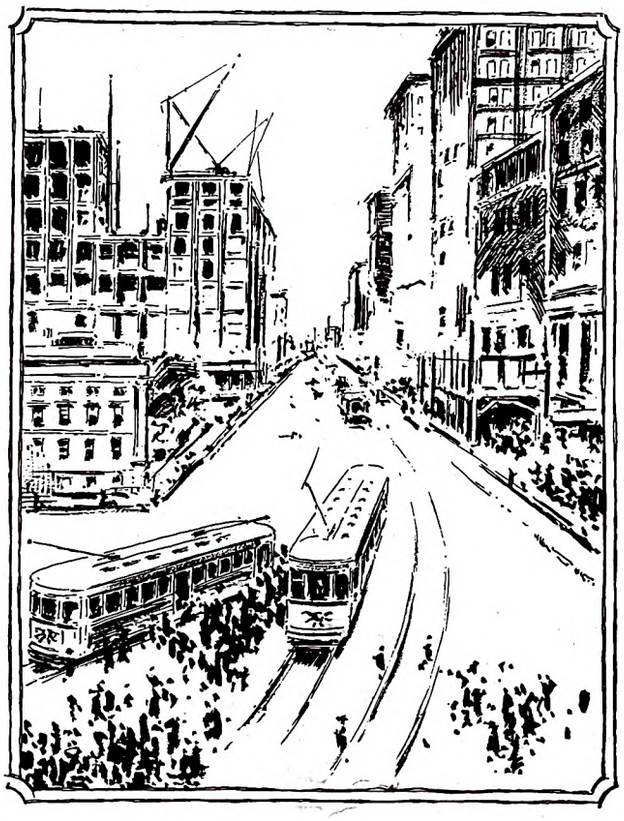
for Brooklyn City Railway



Handling Brooklyn crowds with speed

No other method for the operation of doors and steps can compare with the pneumatic engine on the score of speed with simplicity and absolute safety. Opening and closing is *cushioned;* there is no danger even to a small child; there is no slamming and banging to cause rapid deterioration of door frames and parts.

NATIONAL PNEUMATIC COMPANY

***Executive Office,* 50 Church Street, New York**
***General Works,* Rahway, New Jersey**

CHICAGO
McCormick Building

MANUFACTURER IN
TORONTO, CANADA
Dominion Wheel & Foundries, Ltd.

PHILADELPHIA
Colonial Trust Building

NP

PNEUMATIC

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Quick Getaway and Effective Braking

PEACOCK STAFFLESS BRAKES

Installed and Used on Brooklyn's Cars

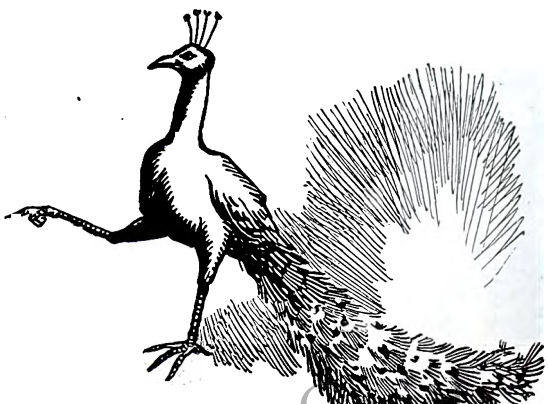
NOT merely "installed", as emergency equipment, but used every day, every trip by every operator. It's part of the rigid safety policy on The Brooklyn City Railroad, to insure that hand brakes are always in working order, and that men know how to use them effectively.

And just as Peacock Staffless Brakes have been the choice in the past, they are included on these latest cars as a matter of course. Emphatically—they've made good!

National Brake Co., Inc.
890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative
Lyman Tube & Supply Company, Limited, Montreal, Canada

Here it is!



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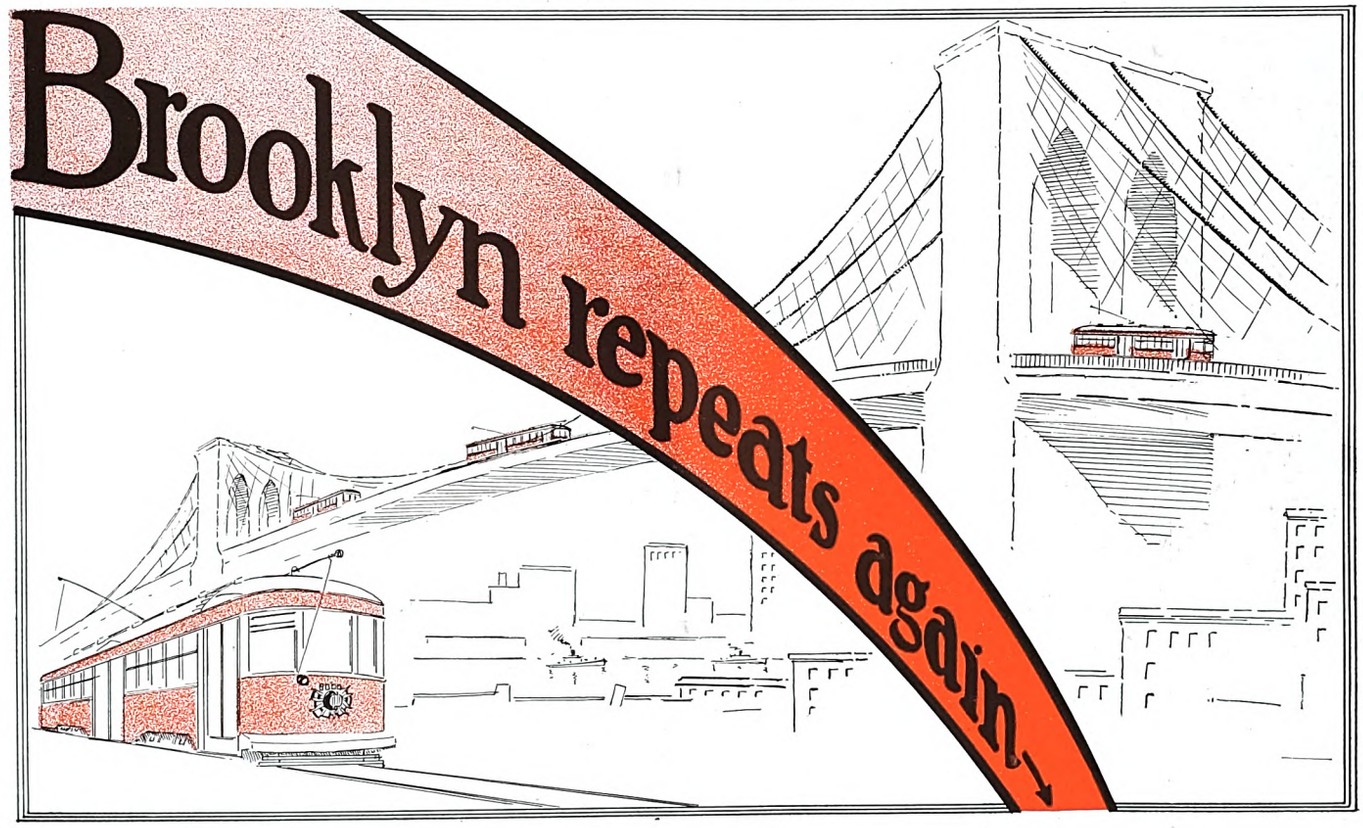
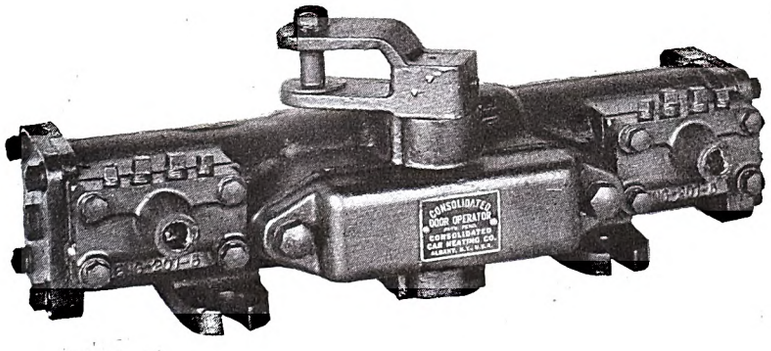
Beat Automotive Traffic in Brooklyn





CONSOLIDATED DOOR ENGINES

For 200 new cars in 1923
For 185 new cars in 1925

Consolidated Door Engines have firmly established their place as a factor in the electric railway field. They give such satisfactory service and need such slight maintenance that repeat orders come naturally.

CONSOLIDATED CAR-HEATING COMPANY

Albany

New York

Chicago

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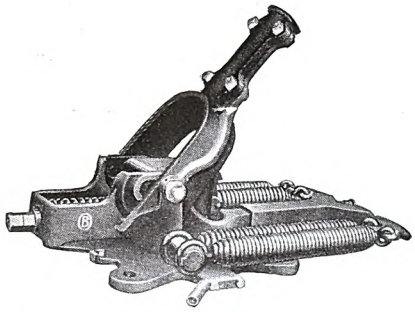
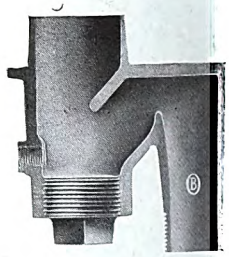
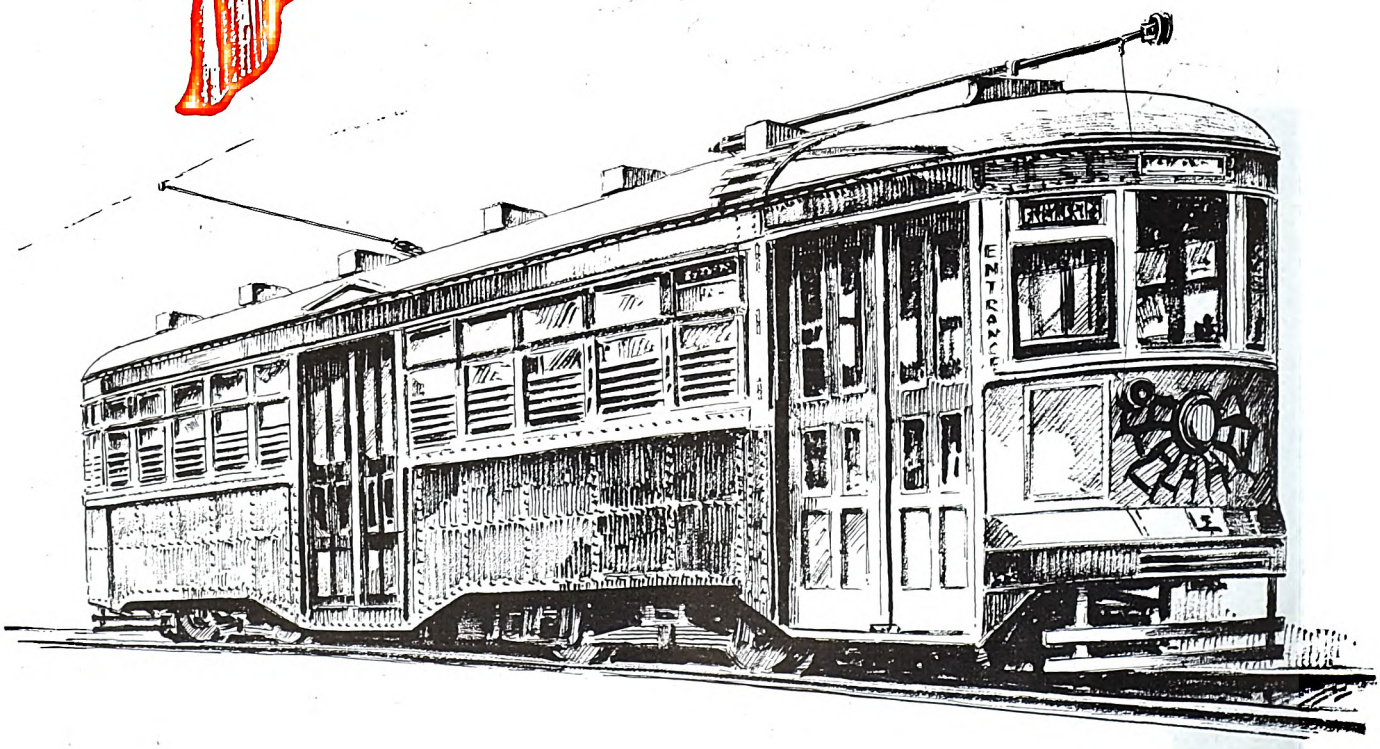
O-B Products



O-B
Trolley Bases



O-B
Sand Traps



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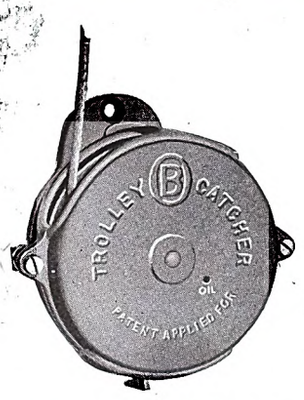
Provides Passenger Comfort and Safety

The high spots of operating efficiency on Brooklyn's new cars

Imperial Headlights



Improved O-B Self Oiling Trolley Catchers

In the execution of Brooklyn City Railroad's order each manufacturer has given of his best in the effort to produce street railway cars worthy of modern standards.

We are proud to have contributed the above mentioned standard O-B Specialties, as we believe, the best and most efficient that present day practice can afford.

The Ohio Brass Co.

Mansfield, Ohio, U.S.A.

TROLLEY MATERIAL — ELECTRIC RAILWAY CAR EQUIPMENT — RAIL BONDS — HIGH TENSION PORCELAIN INSULATORS — THIRD RAIL INSULATORS

NEW YORK — PHILADELPHIA — PITTSBURGH
CHICAGO — CHARLESTON, W. VA.
LOS ANGELES — SAN FRANCISCO — PARIS, FRANCE

Dominion Insulator & Mfg. Co., Limited — Niagara Falls, Ontario, Canada

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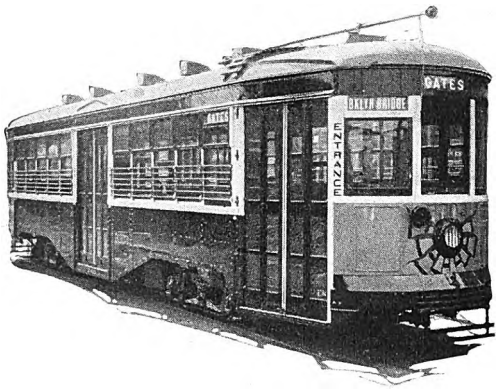
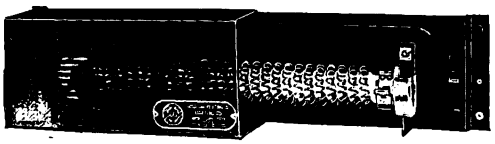
More Gold Car Heaters for Brooklyn

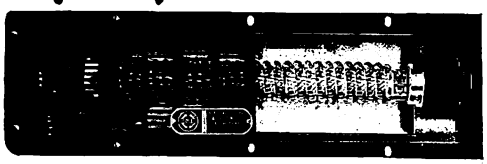


8040 more to be exact!

6030 Truss Plank
1340 Panel
670 Vestibule



No. 478E Truss Plank



No. 414E Panel

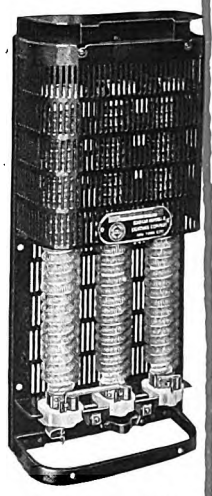
About eighteen months ago, when the first 300 of The Brooklyn City R.R.'s new cars were placed on the tracks, 4800 Gold Car Heaters went into service to keep Brooklyn car riders comfortable.

Now comes Brooklyn's second big order, with Gold Car Heaters again on the specification sheets.

And when such an experienced and successful operating company as The Brooklyn City Railroad "comes back for more" it is mighty strong evidence of proved successful operation of Gold's Electric Heaters with their Low Cost of Installation, Ease of Inspection, Ease of Repairs, if necessary, which spells ECONOMY and the Proper Material for Coils, which is the heart of an Electric Heater, spells EFFICIENCY.

Nor is Brooklyn City alone in the choice. Gold's Electric Heaters have been consistently specified by many other famous electric railway systems and steam railroads using electric heating.

We manufacture all types of heaters and thermostatic control adapted for every class of railway service, from trackless trolley to railroad car; also for waiting rooms, etc. Write us.



No. 470E
Vestibule

GOLD CAR HEATING & LIGHTING CO.
Bush Terminal
220-36th St., Brooklyn, N. Y.

All Coil Supports Interchangeable

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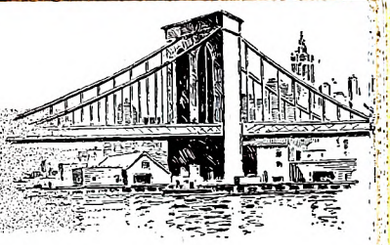
Save Energy in Brooklyn



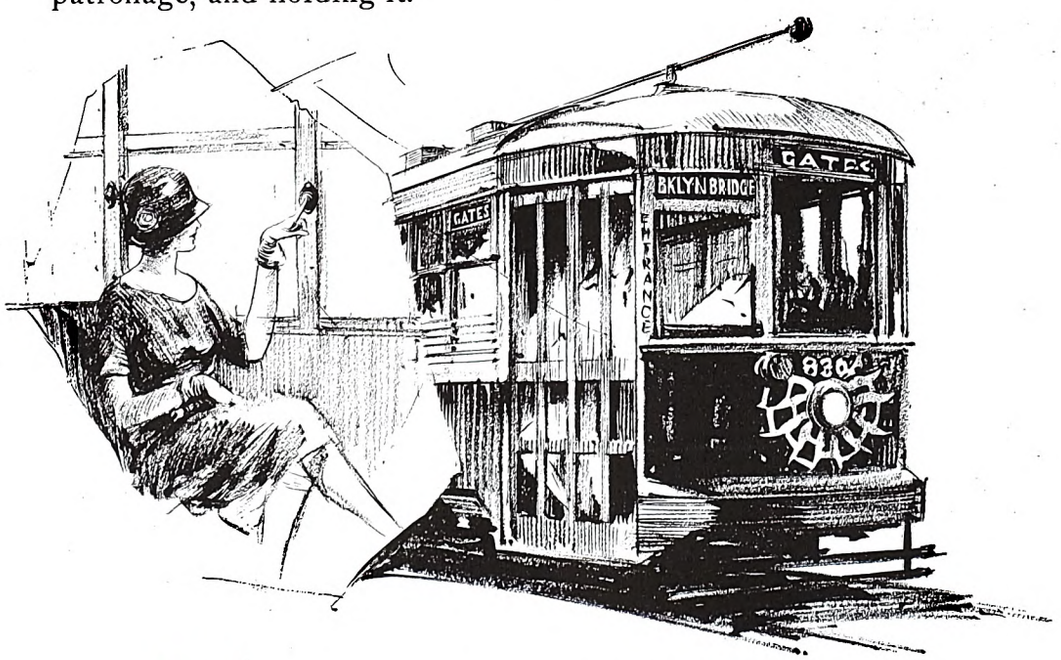
Keystone

written on the record
of Brooklyn's revenue-
building trolley cars

Get more patrons—
and keep 'em satisfied

That's the principle on which the Brooklyn City Railroad is being made a public utility in the truest sense—and incidentally a financially successful traction system.

Plenty of conspicuous route and destination signs, and also a practical, always-on-the-job passenger signal system are two of the outstanding equipment details which materially aid in attracting traffic patronage, and holding it.



- *FARADAY SIGNAL SYSTEMS*
- *INTERNATIONAL FARE REGISTERS*
- *HUNTER DESTINATION SIGNS*

ELECTRIC SERVICE SUPPLIES CO.

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO
Monadnock Bldg.

PITTSBURGH
839 Oliver Building

BOSTON
88 Broad St.

SCRANTON
316 N. Washington Ave.

DETROIT
General Motors Building

Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

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Attractiveness, Speed and Economy

Fine new cars~and sure

TEX

LUBRICATION

TEXACO

THE TEXAS COMPANY, U. S. A.

Texaco Petroleum Products

Digitized by Google

Earn Greater Net Revenue in Brooklyn

of a good start with

ACO

SERVICE

FOR years the Brooklyn City Railroad and all of the B.M.T. lines have been TEXACO Serviced.

TEXACO Engineers have constantly worked right in with the roads' own operating engineers, and have placed the lubrication of every moving part in these vast transportation systems on a uniformly efficient and economical basis.

Certainly the new equipment, now being delivered to the Brooklyn City Railroad, is assured of a fine start and a long life of profitable operation with TEXACO products supplying the lubrication.

17 Battery Place, New York, N. Y.

Offices in principal cities

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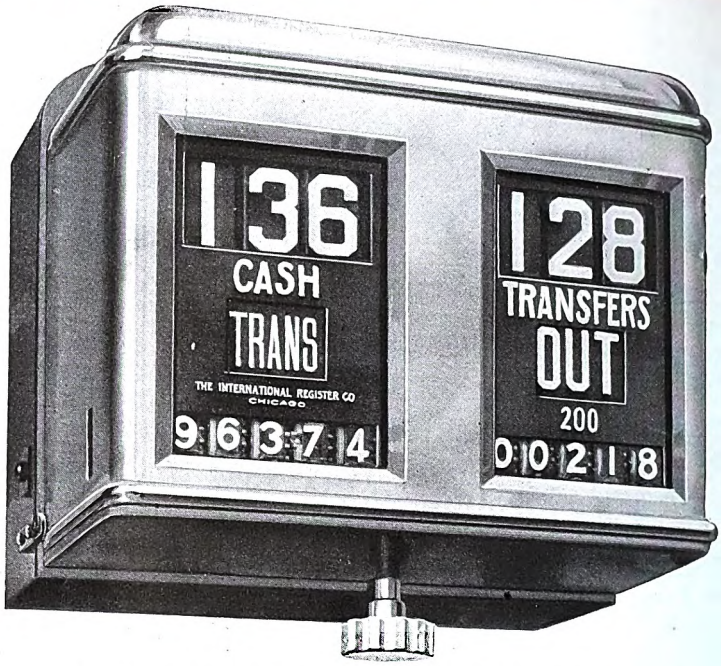
Shorter Running Time with Modern Cars

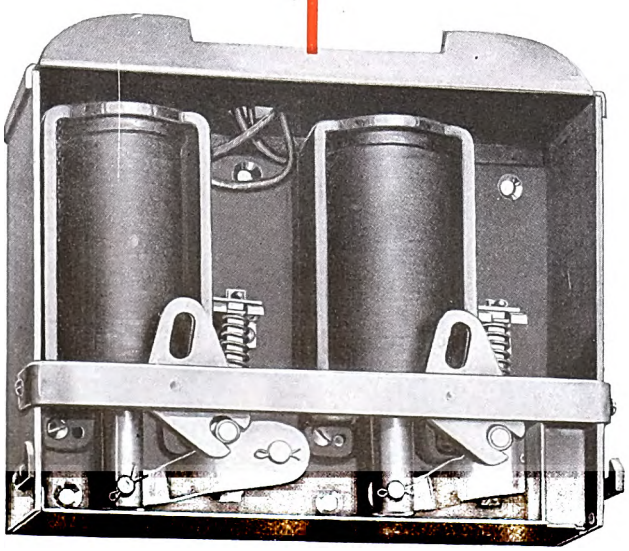
International Registers *in* Brooklyn



R12 electrically operated double register

Electrically operated from fare boxes!

B12 Electric Back for double register



International registers have been used on the Brooklyn system for thirty years, their purchases having exceeded 2500.

The new type Internationals, the R12 double register, electrically operated, were installed on the first 200 of this new type of car, and have given such efficient service that the remaining 335 cars are being similarly equipped. The cash side is operated by the dropping of a nickel or dime; the ticket side by a push button.

The various types of International registers today are the logical development of over thirty years of register design and construction by this company. They are practically the standard of the electric railway industry.

The International Register Co.
15 South Throop Street, Chicago, Illinois

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Visible, Audible, Instantaneous, Automatic Registration

THE experience in one year with the new electrical Johnson Fare Box in operation on the 200 Brooklyn cars, and the 335 now being installed on the new Brooklyn cars, proves:

1. The type "J" Electric Fare Box will reduce your present maintenance fare collection cost fifty per cent (50%).
2. It relieves the Conductor of at least 75% of the present duties he has to perform as to fare collection.
3. The "J" Box will save at least 10% of your present loading time.
4. It makes inspection for your Secret Service and Inspectors at least 25% easier and far more accurate.
5. It is impossible to estimate how many accidents this new equipment will prevent on one-man cars and buses, but it stands to reason that if an operator has no fare collection duties to perform, other than making change, he can give considerably more attention to the driving of the car and looking out for the passengers.
6. It will increase the receipts at least 4%.

Johnson Fare Box Co.
Ravenswood, Chicago, Ill.

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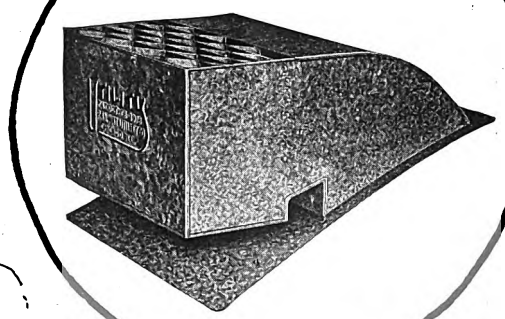


No complaints on the score of fresh air!

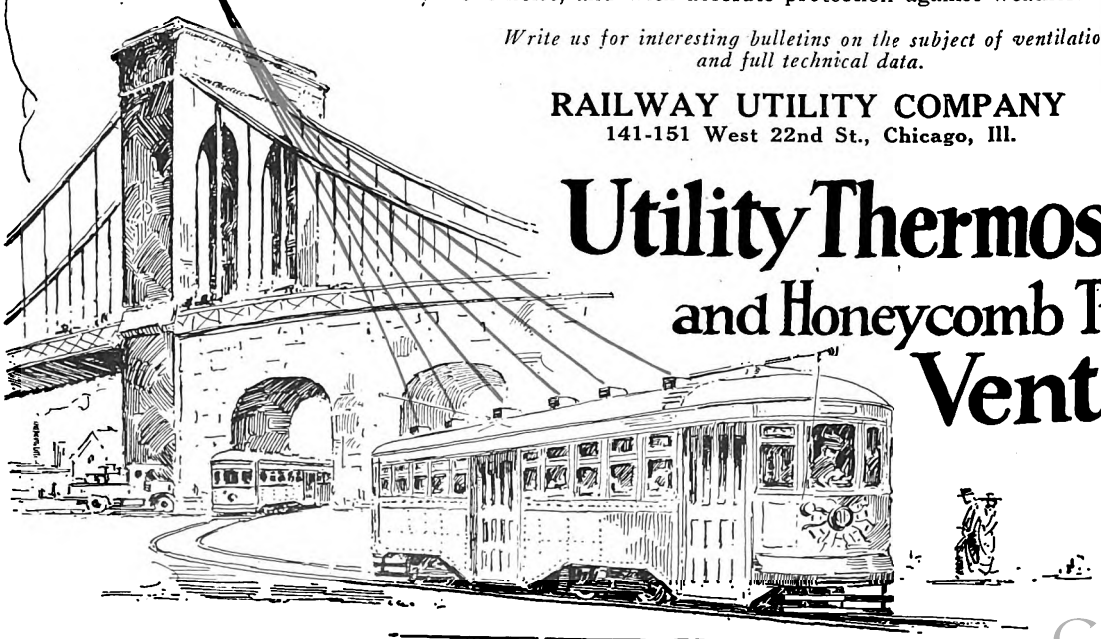
They all want fresh air!

But some like it hot and some like it cold; some don't mind if it whistles 'round their ears, others can cause the conductor no end of worry, and create no little ill-will, if they're forced to sit in a draught.

So Brooklyn's new cars together with the cars of the Chicago Surface Lines and many other progressive roads, are fitted with Utility Honeycomb Roof Ventilators and Utility Thermostats scientifically constructed to maintain a uniform temperature and give an ample flow of clean fresh air, without draft, without noise, and with absolute protection against weather.

Write us for interesting bulletins on the subject of ventilation and full technical data.

RAILWAY UTILITY COMPANY
141-151 West 22nd St., Chicago, Ill.



Utility Thermostats and Honeycomb Type Ventilators

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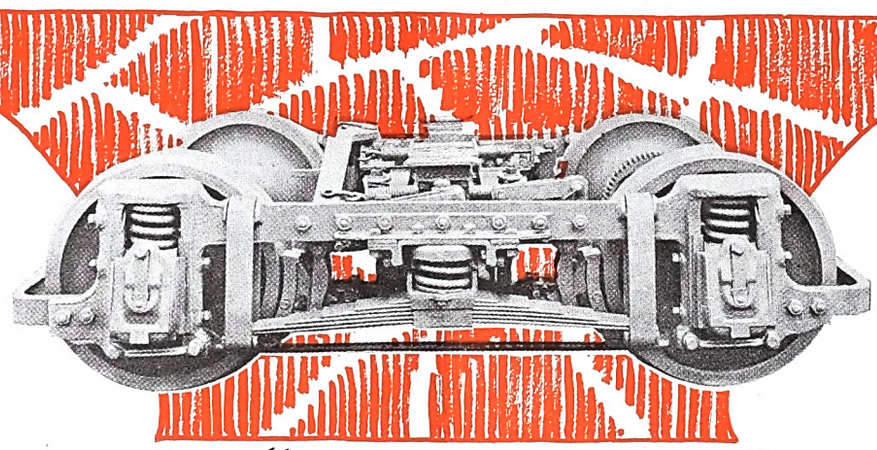
Provides Passenger Comfort and Safety



"For the business end of the new car"

STANDARD
ROLLED STEEL WHEELS

STANDARD STEEL WORKS COMPANY
Philadelphia, Pa.

BRANCH OFFICES:

CHICAGO	PORTLAND, ORE.	ST. PAUL, MINN.
ST. LOUIS	RICHMOND, VA.	PITTSBURGH, PA.
NEW YORK	SAN FRANCISCO	LOS ANGELES, CAL.
HOUSTON, TEXAS	BOSTON	MEXICO CITY, MEX.

WORKS: BURNHAM, PA.

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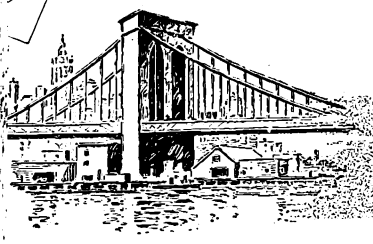


Attractiveness, Speed and Econon

Brooklyn comes to

For Trolley Poles and Wheels

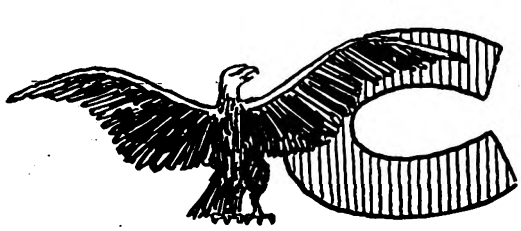
Only the best of service-proved equipment would do for Brooklyn City's new car order. Columbia Trolley Poles and Wheels were specified because for years past they've been piling up unusually good service records all over the country—a natural result of sound practical design backed by 35 years' experience in the building of such equipment.

Columbia Trolley Poles are made in butt weld and seamless types, reinforced at the lower end to take up bending strains. Standard lengths 11 to 16 ft.

Columbia Trolley Wheels are made exclusively of virgin metal alloys developed through years of experimenting for just-right hardness for least wire wear and greatest wheel mileage.

COLUMBIA

Air Brake Handles
Armature Bearings
Armature Coils
Brake Parts
Controller Handles
Controller Parts
Commutators
Door Mechanisms
Gear Cases
Resistance Grids
Motor Parts
Trolley Harps, Poles, Wheels, etc.
Also Iron, Steel, Brass, Bronze and White Metal Castings; Drop Forgings



Columbia Machine Works & Malleable Iron Co.
3313 Atlantic Avenue

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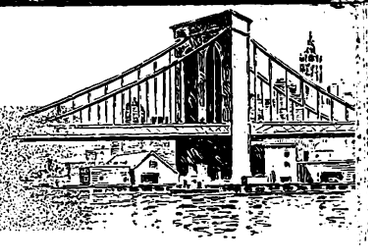
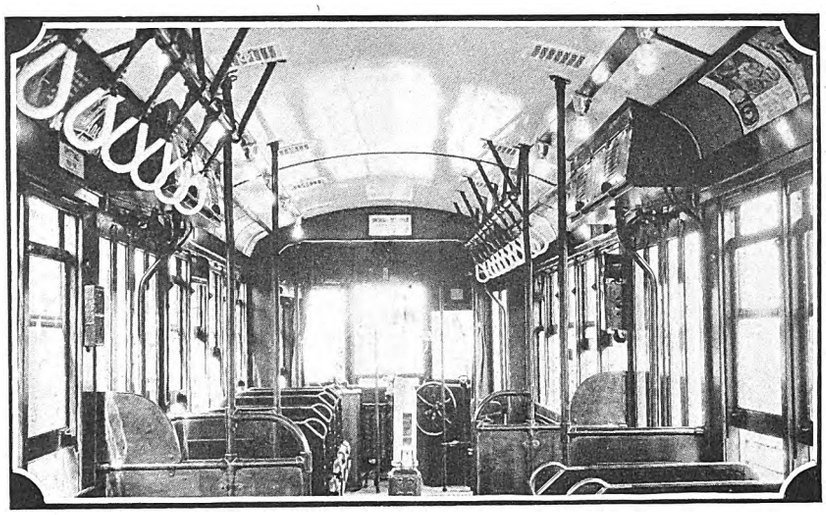


Columbia, Brooklyn—



For Nevasplit Headlinings

Notice the headlinings of these new Brooklyn cars—smooth, perfectly formed and flawlessly painted. Nevasplit gives this fine finish *always*, with least installation trouble and expense. What is more, Nevasplit headlinings keep their appearance year in and year out.

And there are sound reasons why! Nevasplit is wood in its highest form of refinement—a wood fiber board without knots, grain, sap or artificial stiffening. It has tremendous tensile strength, is non-inflammable, water-proof and a splendid heat and cold insulation. Its efficiency and economy has been consistently demonstrated in years of service on every type of electric railway passenger car.

COLUMBIA

- Armature Bearing Babbitting and Broaching Machines
- Armature Buggies
- Armature Lead Flattening Rolls
- Shaft and Axle Straighteners
- Babbitting Molds
- Banding and Heading Machines
- Car Hoists
- Coil Winding and Taping Machines
- Pinion Pullers
- Pit Jacks, etc., etc.

Malleable Iron Company
Brooklyn, N.Y.

COLUMBIA MACHINE WORKS

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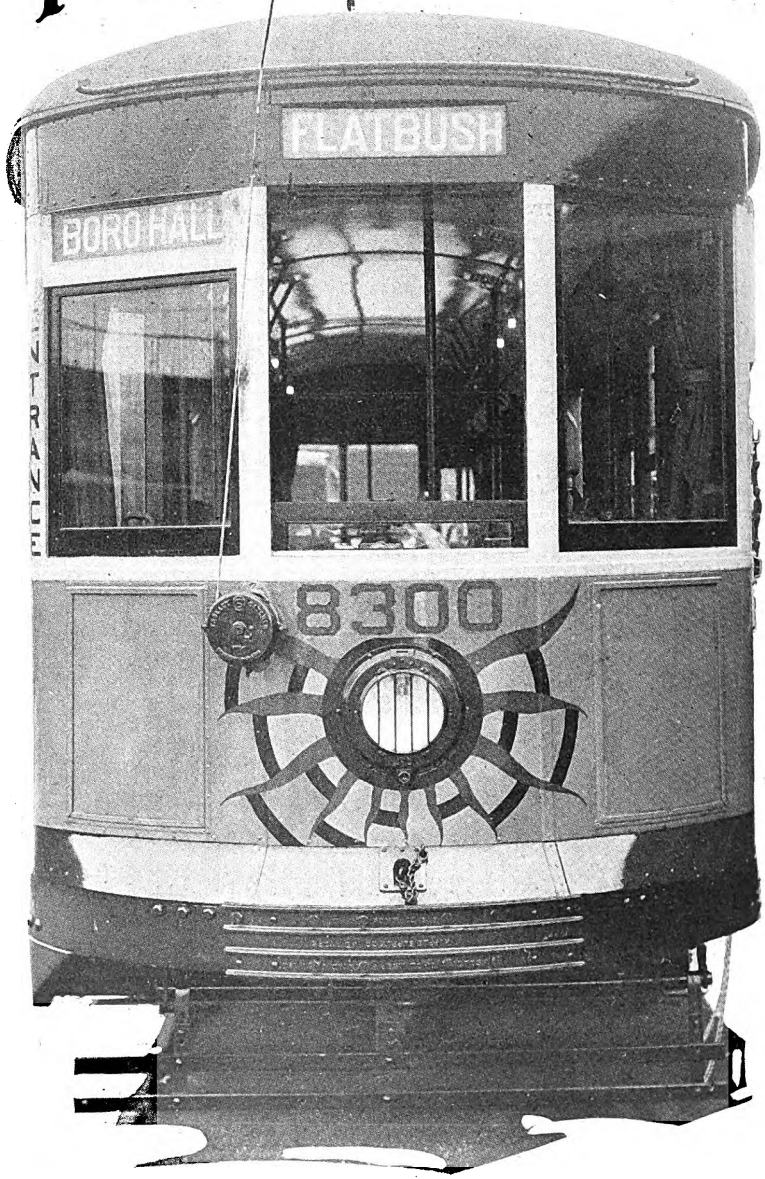
The trolley cord Samson Spot



The consistently long life and uniform high quality of Samson Spot Trolley Cord have long been demonstrated in everyday service on Brooklyn's street cars. So it was but natural that this tough, flexible, smoothly-braided and waterproof cord should be specified for the 335 new cars on the Brooklyn City R.R.'s orders.

Write for Samples.

The Samson Cordage Works, 88 Broad St., Boston, Mass.

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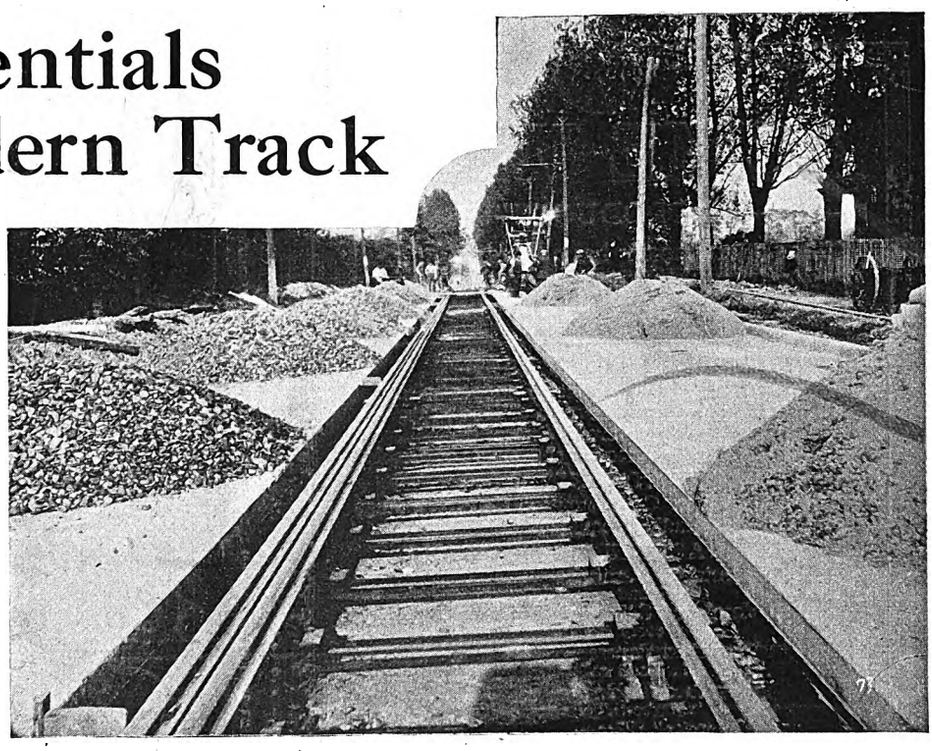
Prime Essentials of the Modern Track



Concrete for permanence . . . steel for strength . . . Wood blocks cushioned in asphalt for shock absorption.

Permanence, strength, resiliency —these are the **undisputed,** prime essentials of the modern track.

Judged on that basis Dayton Resilient Track scores 100!

The Dayton Mechanical Tie Co.
707 Commercial Building
DAYTON, OHIO

DAYTON Resilient TIE

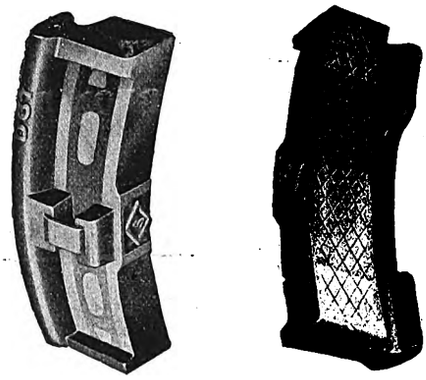
Arc Weld Rail Bonds

AND ALL OTHER TYPES
Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago
New York
Boston
Cleveland
Pittsburgh
Denver
U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle

BRAKE SHOES
AERA Standards
Brake Heads



Diamond "S" Steel Back and Lug Shoes best for all equipment.

Manufactured and sold under U. S. Patent and Registered Trade Mark.

American Brake Shoe and Foundry Co.
30 Church Street, New York
332 So. Michigan Ave., Chicago

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ACME WIRE

PRODUCTS

Acme engineers have studied electrical insulating materials for years. Perhaps they can solve your problem.

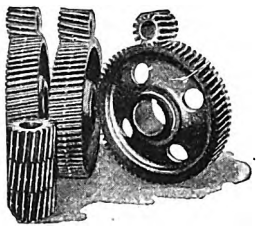
ACME MAGNET WIRE
"Enamelite"—Plain enameled copper wire
"Cottonite"—Cotton-covered "Enamelite"
"Silkenite"—Silk-covered "Enamelite"
Magnet Wire—Cotton or silk, single or double

ACME COIL WINDINGS
Field Coils, Meter Coils, Ignition Coils, Windings for Audio and Radio Frequency Transformers.

ACME VARNISHED INSULATIONS
Varnished Cambrics—
Black and yellow
Varnished Silks and Tapes—
For every requirement
Varnished Papers—
Black and yellow
Varnished Tubing—
"Spaghetti," all sizes, 5 colors
"Celatsite" Wire—
Tinned, spaghetti-covered wire for radio sets; 5 colors
Insulating Varnishes

Catalog sent Engineers and Executives

THE ACME WIRE COMPANY
Main Office and Plant, New Haven, Conn.
New York, 52 Vanderbilt Ave.; Chicago, 427 West Erie Street; Boston, 80 Federal Street; Cleveland, Guardian Bldg.;



"Tool Steel" helical gears are Quiet on the start and Continue Quiet because They dont wear.

BUY THE BEST

The Tool Steel Gear and Pinion Co.
CINCINNATI, OHIO

You're having brush trouble

CORRECT IT

USE LE CARBONE CARBON BRUSHES

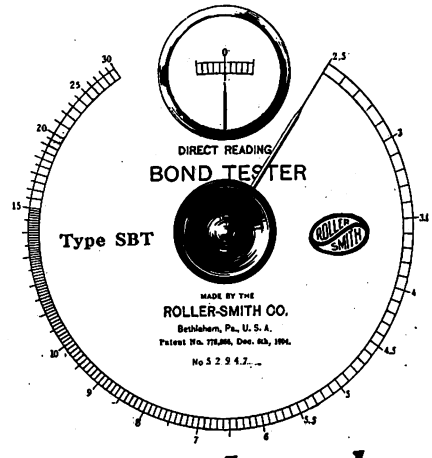
They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron
345 Madison Avenue, New York

Pittsburgh Office: 634 Wabash Bldg.
Chicago Office: 1657 Monadnock Block
San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd., Montreal and Toronto



Check up these losses!

Assuming 30 ft., 70 lb. A.S.C.E. rails and a well-known make and type of bond, the cost of bonding five miles of track is about $1,318.50. The resistance of each bond under perfect conditions is equal to 2.51 ft. of unbroken rail.
Increase of resistance to average of 10 ft. means losses in bonds equal to about $1,698.58 *over normal loss* (assuming current at two cents per kw.h.).
The "One-Man" ROLLER-SMITH Bond Tester locates these leaks and warns you of your losses.

Send for Bulletin No. G-200 and G-201.

"An Experience of over thirty years is behind every ROLLER-SMITH product."

ROLLER-SMITH COMPANY
Electrical Measuring and Protective Apparatus

Main Office:
2128 Woolworth Bldg.,
NEW YORK

WORKS:
Bethlehem, Penna.

Offices in principal cities in U. S. A. and Canada, also in Havana, Cuba.

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AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY NEW YORK

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS

SALES OFFICES:

NEW YORK, N. Y.....Empire Bldg.
Philadelphia, Pa.....Widener Bldg.
Boston, Mass.....120 Franklin St.
Baltimore, Md.....Continental Bldg.
PITTSBURGH, PA.....Frick Bldg.
Cincinnati, Ohio.....Union Trust Bldg.
Cleveland, Ohio.....Rockefeller Bldg.
Detroit, Mich. . . Buhl Building
CHICAGO, ILL.....208 So. La Salle St.
St. Louis, Mo..Liberty Central Trust Bldg.
Denver, Colo....First National Bank Bldg.
Salt Lake City, Utah..Walker Bank Bldg.
Duluth, Minn.....Wolvin Bldg.
Minneapolis, Minn.....629 2nd St., S. E.

Pacific Coast Representative:
U. S. Steel Products Co., Pacific Coast Dept.
San Francisco, Cal.....Rialto Bldg.
Portland, Ore.....Selling Bldg.
Seattle, Wash..4th Ave. So., cor Conn. St.

Export Representative: United States Steel Products Co., 30 Church Street, New York

Lorain Special Trackwork Girder Rails

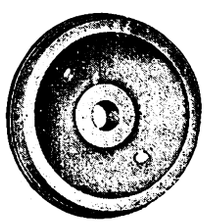
Electrically Welded Joints

THE LORAIN STEEL COMPANY
Johnstown, Pa.

Sales Offices:
Atlanta Chicago Cleveland New York
Philadelphia Pittsburgh

Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.



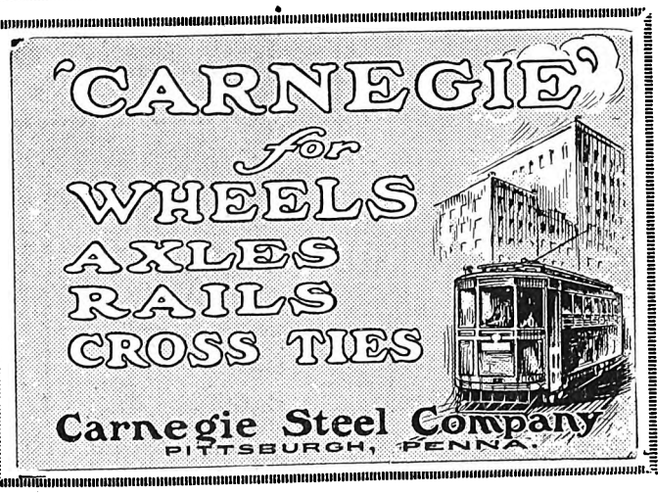
Cambria Rolled Steel Electric Car Wheels

Best for Longer Service

Other products for the electrical field includes axles, armature shafts, rails, spikes, track work, splice bars, bolts, tie plates, tie rods, pole line material, sheets, magnet steel and gear blanks.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

BETHLEHEM



BARBOUR-STOCKWELL CO.

205 Broadway Cambridgeport, Mass.
Established 1858

Manufacturers of

Special Work for Street Railways

Frogs, Crossings, Switches and Mates
Turnouts and Cross Connections
Kerwin Portable Crossovers
Balkwill Articulated Cast Manganese Crossings

ESTIMATES PROMPTLY FURNISHED

E.G. Long Company

50 Church St., New York

Electric Railway Materials
Peckham Truck Parts

New York Representatives:

American High Speed Chain Co.—Silent Chain Drives.
D. O. James Manufacturing Co.—Speed Reducing Transmissions.
Bound Brook Oil-Less Bearing Co.—Brass and Bronze Castings.
Ulster Foundry Corporation—Grey Iron Castings.

The DIFFERENTIAL CAR

Standard on 60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

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85 LIBERTY STREET, NEW YORK

Builders since 1868 of Water Tube Boilers of continuing reliability

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PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
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CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building

WORKS
Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters since 1898 and of Chain Grate Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 521-5 Baronne Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 435 Seventeenth Street
SALT LAKE CITY, 405-6 Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

THE WORLD'S STANDARD

"IRVINGTON"

Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.

Irvington, N. J.

Sales Representatives in the Principal Cities

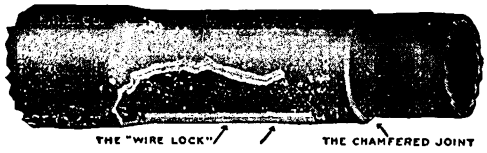
The Kalamazoo Trolley Wheels

have always been made of entirely new metal, which accounts for their long life WITHOUT INJURY TO THE WIRE. Do not be misled by statements of large mileage, because a wheel that will run too long will damage the wire. If our catalogue does not show the style you need, write us—the LARGEST EXCLUSIVE TROLLEY WHEEL MAKERS IN THE WORLD.

THE STAR BRASS WORKS

KALAMAZOO, MICH., U. S. A.

ELRECO TUBULAR POLES



COMBINE

Lowest Cost **Lightest Weight**
Least Maintenance **Greatest Adaptability**

Catalog complete with engineering data sent on request.

ELECTRIC RAILWAY EQUIPMENT CO.
CINCINNATI, OHIO
New York City, 30 Church Street

TULC
A LUBRICANT

We make a specialty of

ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC on your equipment

The Universal Lubricating Co.
Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company, Straus Bldg.

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W. C. PETERS, Manager Sales and Engineering

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Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago.

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Tool Steel Gears and Pinions
Bell Locked Fare Box and Change Maker
The Aluminum Field Coils
Walter Tractor Snow Plows
Cutler-Hammer Electric Heaters
Pittsburgh Forge & Iron Co.'s Products
Genesco Paint Oils
E. Z. Car Control Corporation's Safety Devices
Garland Ventilators
Flaxlinum Insulation
Yellow Coach Mfg. Co.'s Single and Double Deck Busses
Economy Electric Devices Co.'s Power Saving and Inspection Meters
Anglo-American Varnish Co., Varnishes, Enamels, etc.
Gilmer Multiple Safety Step Treads
National Hand Holds
Ft. Pitt Spring & Mfg. Co. Springs
Turnstile Car Corporation's Turnstiles
Anderson Slack Adjusters
Feasible Drop Brake Staffs
Dunham Hopper Door Device

"POSITIONS VACANT"

Good jobs appear under this heading in the

"SEARCHLIGHT SECTION"

EMPLOYERS! *Use* these columns for good men.

MEN! *Consult* these columns for good jobs.

8 cents a word. *Minimum $2.00 an insertion.*

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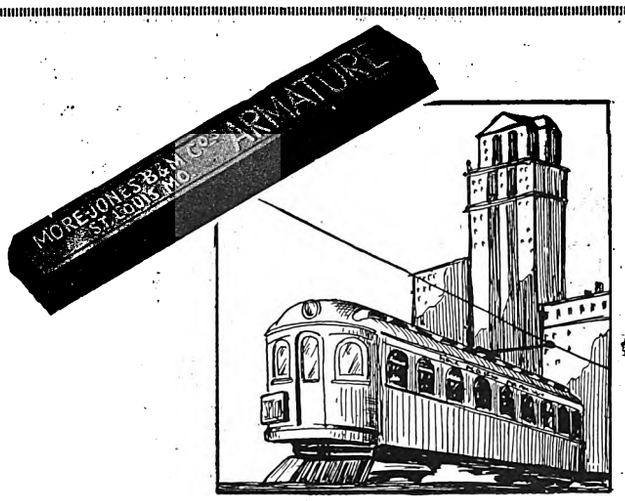


M-J Armature Babbitt

Contains no lead. The proper proportions of copper, tin, antimony and *nickel*—pure new metal—compounded under strict laboratory supervision results in a babbitt metal which successfully resists the strains and temperatures met in electric railway service in a most economical way. It can be used over and over again without deterioration.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES QUALITY PRODUCTS

"Ventilator Tests"

A Booklet You Need!

FREE

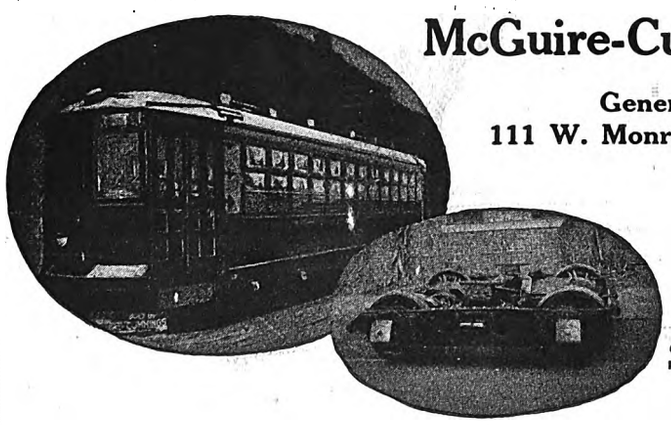
Know what to expect of *any* street car or bus ventilator *before you buy.* This booklet outlines a plan for testing closed-vehicle ventilators and tells how N-L Ventilators perform under test. A valuable booklet — we'll gladly send you a copy of "Ventilator Tests."

N-L

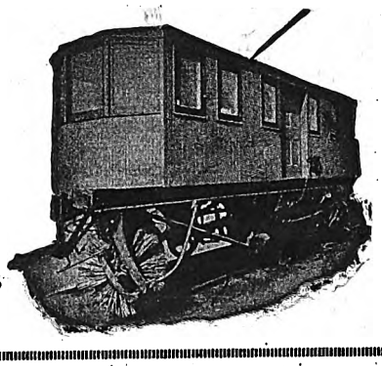
THE NICHOLS-LINTERN COMPANY
7960 Lorain Ave., Cleveland, O.
Canadian Representatives:
Railway & Power Eng. Corp., Ltd., 133 Eastern Ave., Toronto, Ont.

McGuire-Cummings Manufacturing Co.

General Offices:
111 W. Monroe St., Chicago, Ill.



Street Cars
Trucks
Snow Sweepers



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1 TON OR 1000

TRACK EQUIPMENT

L. B. FOSTER CO.

RAIL ACCESSORIES

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BROOMS
Wire or Rattan
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Electrical Machinery, Steam Turbines, Steam Engines, Condensers, Gas and Oil Engines, Air Compressors, Air Brakes

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SEARCHLIGHT SECTION

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Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 8 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

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Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

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Rates for larger spaces, or yearly rates, on request.

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R.F.J.

POSITION VACANT

GENERAL foreman who is good armature winder for small electric railway shop near New York. P-823, Elec. Ry. Journal, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

CLAIM agent available, 10 years' experience, member of bar; have good reason for making change. Prefer eastern location with small company in medium sized city. Opportunity for advancement more important than salary. PW-824, Elec. Ry. Journal, Leader-News Bldg., Cleveland, Ohio.

EXECUTIVE, city or interurban; twelve years' experience, electrical engineering, master mechanic, general superintendent. Age, 35. PW-757, Electric Railway Journal, Tenth Ave. at 36th St., New York.

GENERAL foreman, 26 years' experience in tracks and special work. PW-821, Electric Railway Journal, Tenth Ave. at 36th St., New York.

MASTER mechanic or shop superintendent, 20 years' experience street railway light and heavy interurban cars, motor buses and trucks. Small or large property. PW-825 Elec. Ry. Journal, 7 So. Dearborn St., Chicago, Ill.

MR. MANAGER: Are accidents costing too large a per cent of your gross; Are your receipts diminishing due to decreasing traffic? Is the attitude of your employees of a negative nature? Are your public relations strained? Are your pull-ins too frequent? If these conditions exist on your property I offer a proven record of 22 years' street and interurban experience wherein these conditions have been developed from the worst to the best. Willing to supervise the departments referred to combined or individually. In charge of safety and educational activities with present connections. Am capable of operating medium size property supplementing supervision with original methods pertaining to safety, salesmanship and employee relations. PW-826, Elec. Ry. Journal, 7 So. Dearborn St., Chicago, Ill.

YOUNG married man desires position as inspection barn foreman or general repair work. Nine years' experience; not afraid of hard work. PW-822, Electric Railway Journal, Tenth Ave. at 36th St., New York.

"Searchlight"
is
Quick Action
Advertising

0233

FOR SALE

MOTOR CAR

1—second hand Mudge Twin Engine Gasoline, Class E-4, car No. 10131 with Adjustable Gauge; manufactured by the Railways Specialty Company, Atchison, Kansas.

Write to

C. A. HARRIS
2101 Beaver Avenue, Pittsburgh, Pa.
Attention of Mr. Poole.

FOR SALE

ELECTRIC SHOVEL
Immediate Delivery

1—Vulcan Class F. 600 v., 1½ cu. yd. capacity.

JAMESTOWN ST. RY. CO.
Jamestown, N. Y.

FOR SALE

20—Birney Safety Cars. Brill built. Seating 32.
8—Steel Interurbans, 48 ft. long. Seating 52.

ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

FOR SALE

Air Compressors
16—C P 27 and 12—D H 16

TRANSIT EQUIPMENT COMPANY
Cars *Motors*
501 Fifth Ave., New York

RAILS
New and Relaying

All sections with frogs, switches carried in stock. We also purchase roads for dismantling.

M. K. FRANK
Park Row Bldg., New York
Union Trust Bldg., Pittsburgh, Pa.

SOME ONE WANTS TO BUY

the equipment or machinery that you are not using.

This may be occupying valuable space, collecting dust, rust and hard knocks, in your shops and yards.

SELL IT BEFORE DEPRECIATION SCRAPS IT

THE SEARCHLIGHT SECTION
IS HELPING OTHERS

—LET IT HELP YOU ALSO

0128

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WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Accountant
James T. Swan Co.

Advertising, Street Car
Collier, Inc., Barron G.

Air Circuit Breakers
Roller-Smith Co.

Ammeters
Roller-Smith Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
Standard Steel Wks.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson, J. R.

Axles, Steel
Carnegie Steel Co.
Johnson, J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co., The

Bankers and Engineers
James T. Swan Co.

Barges, Steel
American Bridge Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., J. G., The
General Electric Co.
More-Jones Brass & Metal Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Stucki Co., A.

Bells and Gongs
Brill Co., The J. G.
Consolidated Car Heat. Co.
Elec. Service Supplies Co.

Bodies, Bus
Lang Body Co.

Boilers
Babcock & Wilcox Co.

Bolts, Standard, Special & Heat Treated
Horne & Ebling Corp.

Bond Testers
American Steel & Wire Co.
Roller-Smith Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Page Fence & Wire Co.
Railway Track-work Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Brackets and Cross Arms (See also Poles, Ties, Posts, Etc.)
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Amer. Br. Shoe & Fdy. Co.
Barbour-Stockwell Co.
Bemis Car Truck Co.
Brill Co., The J. G.

Brakes, Brake Systems and Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brooms, Wire & Rattan
Paxson Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse E. & M. Co.

Buildings, Steel
American Bridge Co.

Buses, Motor
Brill Co., The J. G.
Mack Trucks

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Long, E. G.

Cables. (See Wires and Cables)

Cambric Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Cars, Dump
Brill Co., J. G., The
Differential Steel Car Co.

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Cars, Passenger, Freight, Express, etc.
Amer. Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Gas, Rail
Brill Co., J. G., The

Cars, Second Hand
Electric Equipment Co.
Transit Equipment Co.

Cars, Self-Propelled
Brill Co., J. G., The
General Electric Co.

Castings, Brass, Composition or Copper
Anderson Mfg. Co., A. & J. M.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
American Steel Foundries Co.
Bemis Car Truck Co.
Standard Steel Wks.

Castings, Malleable and Brass
Amer. Br. Shoe & Fdy. Co.
Bemis Car Truck Co.
Horne & Ebling Corp.

Castings, Steel
Horne & Ebling Corp.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Pantasote Co., Inc.

Ceilings, Plywood, Panels
Haskelite Mfg. Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit-Breakers
Anderson, A. & J. M. Mfg. Co.
General Electric Co.
Roller-Smith Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Cleaners and Scrapers Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Root Spring Scraper Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Elec. Service Supplies Co.

Coils, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.
Intern'l Register Co.
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Elec'l Mfg. Co.
General Electric Co.
Horne & Ebling Corp.
Westinghouse E. & M. Co.

Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Tr. Br. Co.

Condensor Papers
Irvington Varnish & Ins. Co.

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co

Controllers or Parts
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Conveying & Hoisting Machinery
American Bridge Co.

Copper Wire
Anaconda Copper Mining Co.
Page Fence & Wire Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Steel & Wire Co.

Cord, Bell, Trolley, Register
Brill Co., The J. G.
Elec. Service Supplies Co.
Internat'l Register Co., The
Roebling's Sons Co., John A.
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries Co.
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossing, Frog & Switch
Ramapo Ajax Corp.

Crossing, Manganese
Ramapo Ajax Corp.

Crossings
Ramapo Ajax Corp.

Crossing, Track (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc.

Dealer's Machinery & Second Hand Equipment
Elec. Equipment Co.
Frank, M. K.
Harris, C. A.
Jamestown Street Railway Co.
Transit Equipment Co.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heat Co.
General Electric Co.
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.
St. Louis Car Co.

Doors & Door Fixtures
Brill Co., The J. G.
Consolidated Car Heat. Co.
General Electric Co.
Morton Mfg. Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.
Safety Car Devices Co.

Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Elec. Service Supplies Co.

Ears
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.

Electric Grinders
Railway Track-work Co.
Western Electric Co.

Electric Transmission Towers
American Bridge Co.

Electrodes, Carbon
Railway Track-work Co.

Electrodes, Steel
Railway Track-work Co.

Engineers, Consulting, Contracting and Operating
Allison & Co., J. S.
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layng Corp.
Bureau of Commercial Economics, Inc.
Byllesby Co., H. M.
Day & Zimmermann, Inc.
Drum & Co., A. L.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLeuw
McD. Crawford, Norman
McClellan & Junkersfeld
Ong, Joe R.
Railway Audit & Inspection Co.
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
Swan, J. T.
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Allis-Chalmers Mfg. Co.
Westinghouse E. & M. Co.

Fare Boxes
Cleveland Fare Box Co.
Johnson Fare Box Co.
Perey Mfg. Co.
Nat'l Ry. Appliance Co.

Fare Registers
Electric Service Supplies Co.
Ohmer Fare Register Co.

Fences, Woven Wire and Fence Posts
Acme Wire Co.
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
Root Spring Scraper Co.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Coils (See Coils)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Floodlights
Elec. Service Supplies Co.

Forgings
Brill Co., J. G., The
Standard Steel Wks.

Frogs & Crossings, Tee Rail
Ramapo Ajax Corp.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co
Ohio Brass Co.
Westinghouse E. & M Co.

Furnaces, Electric Steel Melting
American Bridge Co.

Fuses and Fuse Boxes
Consolidated Car Heat. Co.
General Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.
Johns-Manville, Inc.

Garages, Steel
Austin Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas Producers
Westinghouse E. & M. Co.

Gas-Electric Cars
General Elec. Co.
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gear Blanks
Brill Co., J. G., The
Standard Steel Wks.

Gear Cases
Chillingworth Mfg. Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Generating Sets, Gas-Electric
General Electric Co.

Generators
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Girder Rails
Lorain Steel Co.

Gong (See Bells and Gongs)

Greases (See Lubricants)

Grinders & Grinding Supplies
Railway Track-work Co.

Grinders, Portable
Railway Track-work Co.

Grinders, Portable Electric
Railway Track-work Co.

Grinding Bricks and Wheels
Railway Track-work Co.

Ground Wires
Page Fence & Wire Co.

Guard Rail Clamps
Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
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Ohio Brass Co.

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Star Brass Works

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Consolidated Car Heat. Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
Smith Heater Co., Peter

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Okonite Co.
Okonite-Callender Cable Co.
Stand. Underground Cable Co.
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Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
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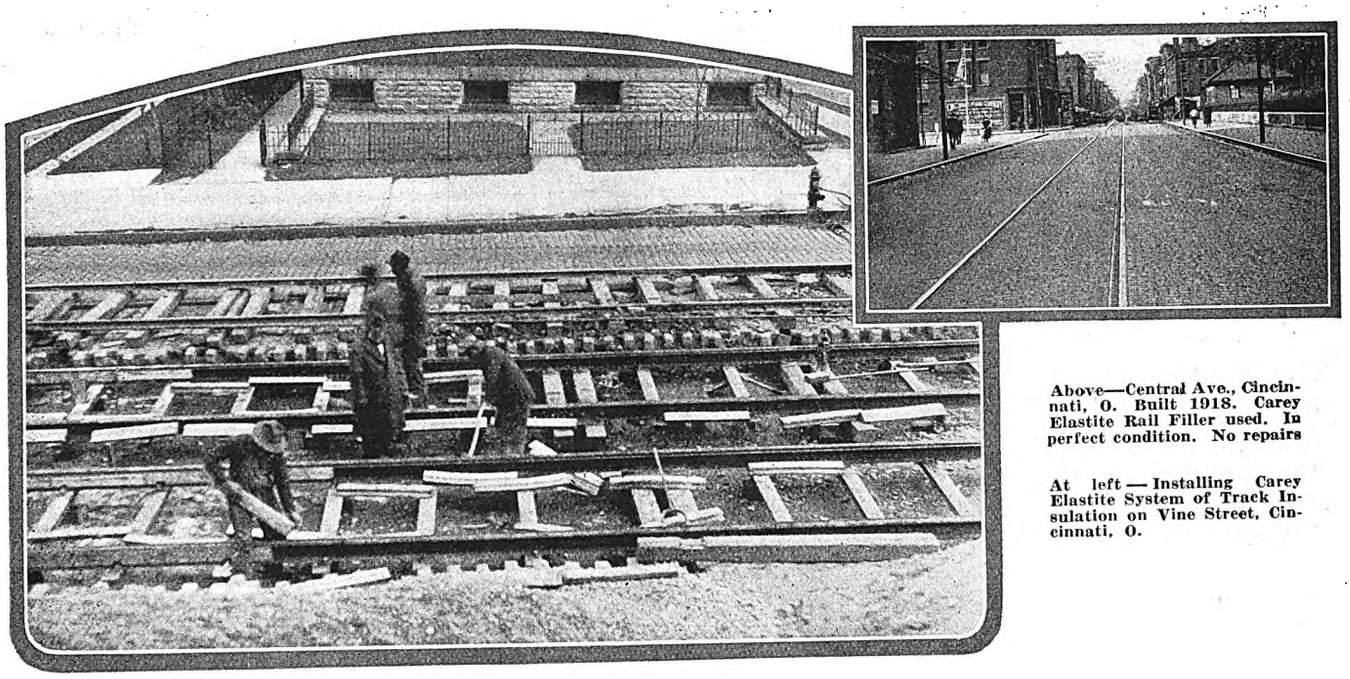

Above—Central Ave., Cincinnati, O. Built 1918. Carey Elastite Rail Filler used. In perfect condition. No repairs

At left — Installing Carey Elastite System of Track Insulation on Vine Street, Cincinnati, O.

Making Vine Street as Good as Central

Cincinnati was the proving-ground for the Carey Elastite System of Track Insulation. It was one of the very first cities to install Carey Elastite rail filler.

Years ago when Cincinnati relaid the wood block paving of Central Ave., Carey Elastite Rail Filler was used. Despite the heavy downtown traffic, not a block has been displaced by rail vibration, traffic-impact, or frost. The street is as smooth and watertight as the day it was laid.

The Carey Elastite System of Track Insulation—greatly improved since Central Avenue was built—was used in the reconstructing of other Cincinnati streets. Vine Street was made as good as Central Avenue. The street railway company will save money thru decreased maintenance costs and prolonged life of pavement.

THE PHILIP CAREY COMPANY
53 Wayne Avenue, Lockland, Cincinnati, O.

Elastite Rail Filler is Easy to Install

a tap of a mallet holds it in the web of the rail.

Carey Elastite Rail Filler is a composition of specially-tempered asphalt and fibre which is used as a resilient cushion between the rail and the pavement, absorbing traffic-impact, rail vibration and traffic-noise. It is preformed to fit any rail-section and is readily shaped on the job to fit any track-curve. It is unaffected by moisture or temperature changes and is enduring under all service conditions.

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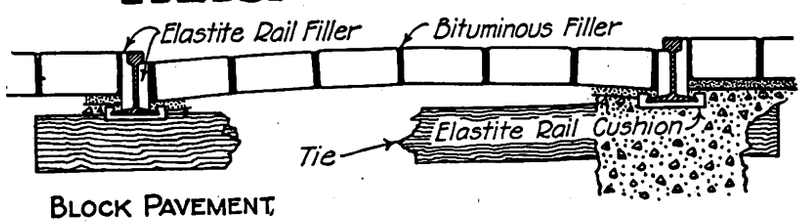
Carey Elastite

SYSTEM OF TRACK INSULATION



BLOCK PAVEMENT

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Irvington Varnish & Ins. Co.
Ohio Brass Co.
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Ramapo Ajax Corp.

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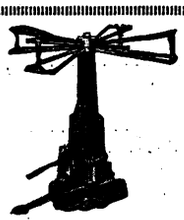

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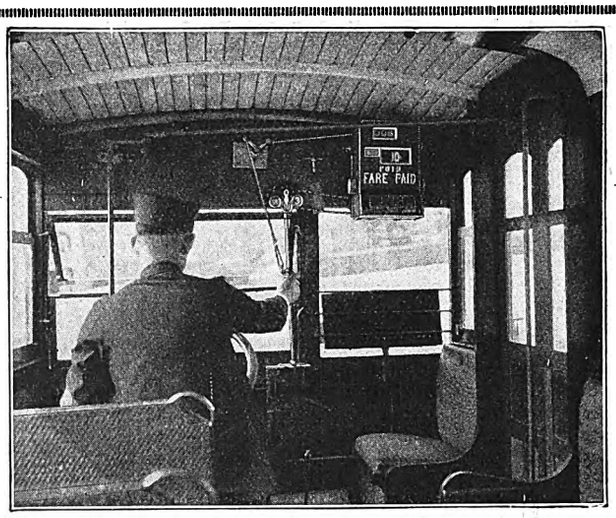

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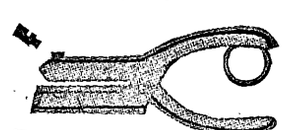

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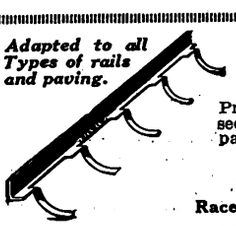

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Write for Illustrated Catalog No. 20

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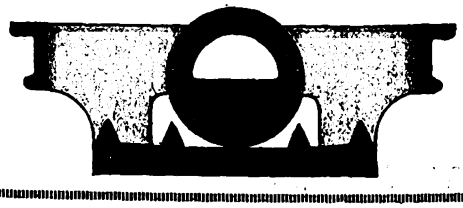
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Annual Statistical Number

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc. January 3, 1925 Twenty Cents Per Copy

Another reel in the story of Phono-Electric

The mills of the Bridgeport Brass Company, home of Phono-Electric Trolley Contact Wire, are today producing a new product,—Phono-Hi-Strength wire. This wire has the weather-permanence and the same coefficient of expansion as copper but *twice its tensile strength.* It is a highly desirable messenger wire for catenary construction and is being so used entirely on the new electrification of the Virginian Railway.

"Bridgeport" BRASS TRADE CO. MARK Phono-Electric

Costs more per mile but less per year.

Bridgeport Brass Company
Bridgeport Connecticut

Phono-Hi-Strength

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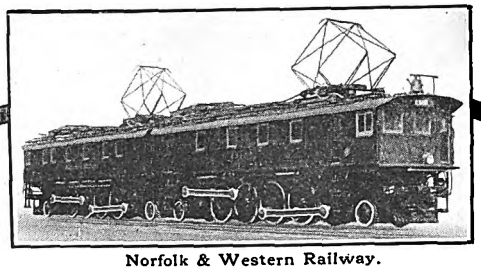
Contributions to Electrification
During 1924

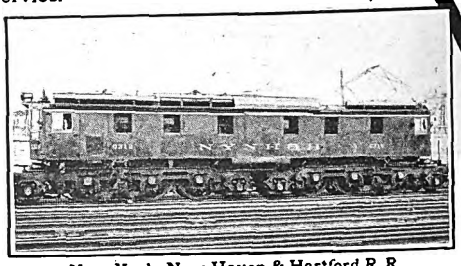


Norfolk & Western Railway.

The Norfolk & Western Railway extended its electrified zone 20 miles during 1924, and placed orders for a further extension of 48 route miles. Four new 414-ton, 4750 hp., 11,000 volts, A-C. Locomotives, consisting of two motive-power units, are now being placed in service.

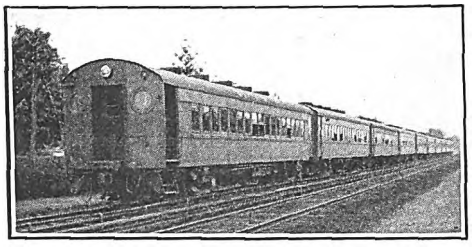
Pennsylvania Railroad

204.3-ton, 3300 hp., 11,000 volt, A-C. Locomotive. The Pennsylvania Railroad has placed in service three new electric locomotives. Two of these are operating in passenger service on the New York Division, and the third in freight service on the Philadelphia electrified zone.



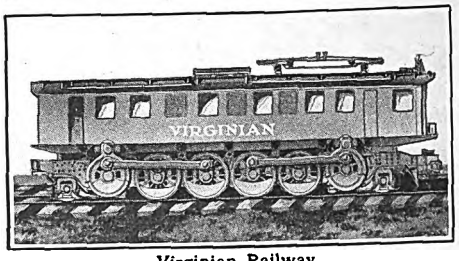
New York, New Haven & Hartford R. R.

179-ton, 2508 hp., A-C. Passenger Locomotive. To maintain 100% electric service, between New York and New Haven, the N. Y., N. H. & H. R. R. received during 1924 twelve high-speed passenger locomotives. Further extensions to their electrified zone are under way.



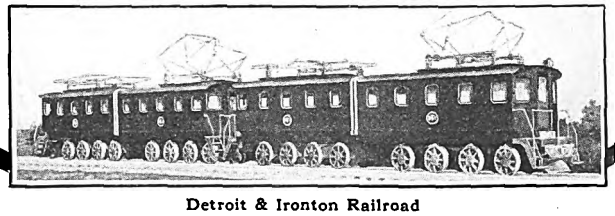
Long Island Railroad

54.5-ton, 430 hp., Multiple-Unit Cars. In order to more efficiently handle New York's heavy suburban traffic, The Long Island R. R. is extending its electrification to Babylon, L. I., a distance of approximately twenty miles. Forty additional multiple-unit equipments are on order.



Virginian Railway

The thirty-six, 200-ton, Alternating-Current Motive-Power Units, for operation over the 213 route miles of the Virginian Railways Electrification, are nearing completion. Electric operation will be inaugurated during the coming year.



Detroit & Ironton Railroad

340-ton, 4200 hp., 22,000-volt, Alternating-Current Locomotive. The Motor-Generator Locomotives, a new development in electric-motive power, now under construction at the Ford Motor Company's plant for the Detroit & Ironton Electrification, are expected to be placed in operation the early part of this year.

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Westinghouse

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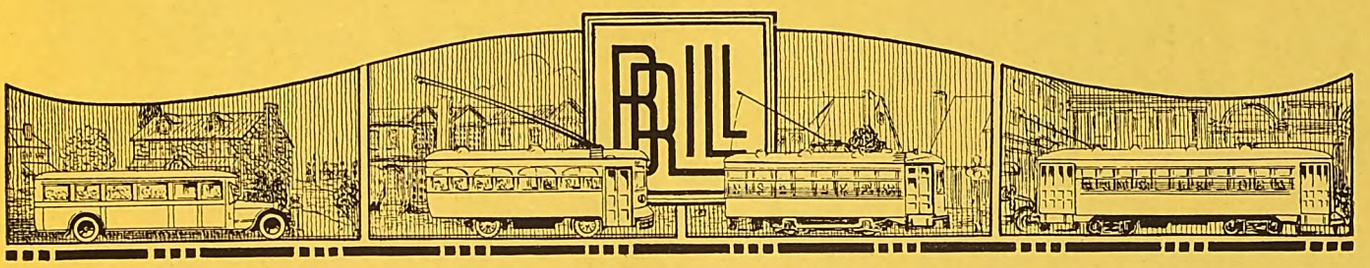

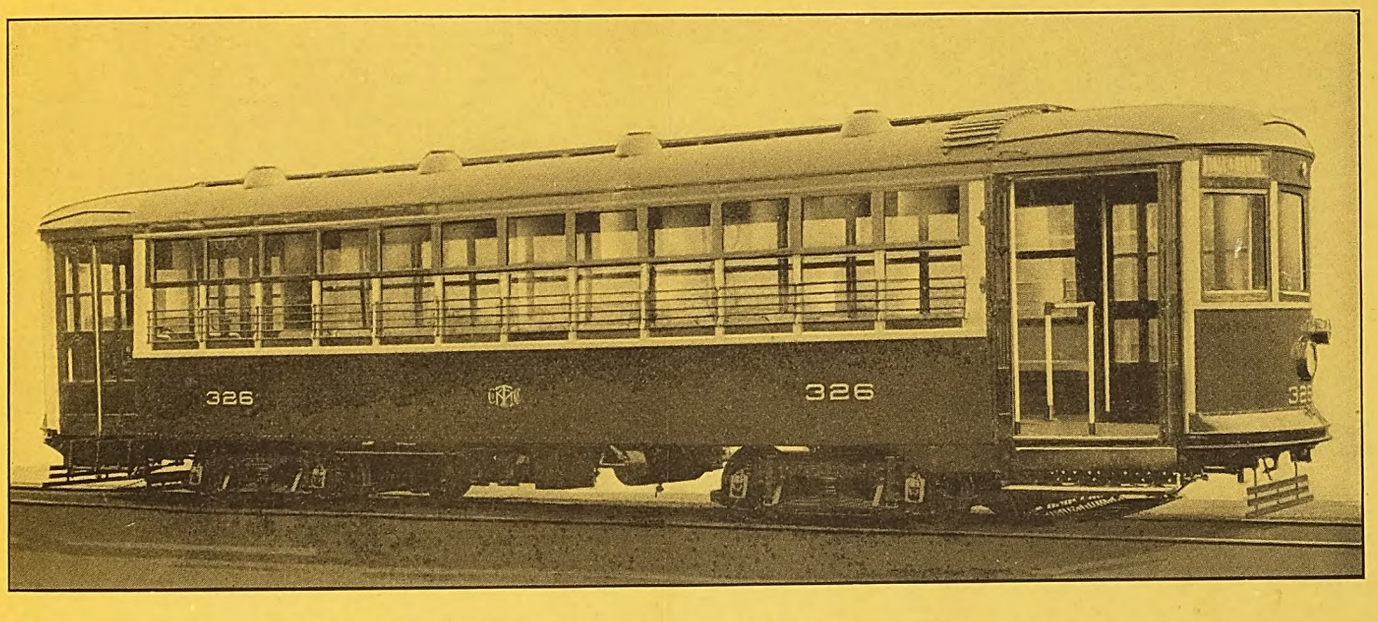

Trenton & Mercer Co. Trac. Corp.

New City and Suburban Cars

Twenty light-weight, one-man two-man cars of this type were recently built in our Philadelphia Plant for Trenton, N. J. Ten cars include quadruple 25 Hp. motor equipment for city service, and ten are equipped with quadruple 35 Hp. motors for suburban service. Otherwise, the cars are practically identical, being mounted on Brill 77-E low-level trucks equipped with Brill Twin Swing Links, measure 44 ft. long over platforms, and seat 48 passengers.

The city cars weigh 34,476 lb. and the suburban cars 36,746 lb.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G.C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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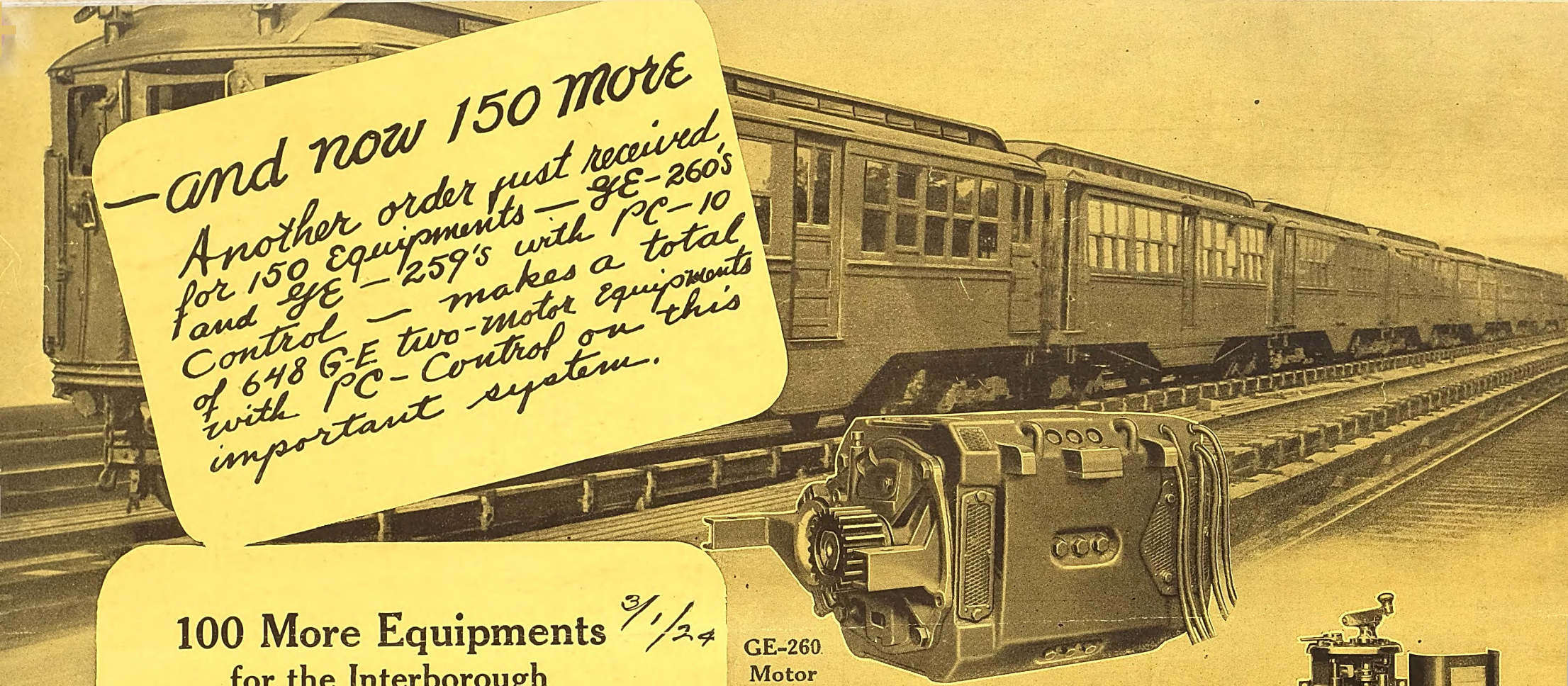

—and now 150 more

Another order just received for 150 equipments — GE-260's and GE-259's with PC-10 Control — makes a total of 648 G-E two-motor equipments with PC-Control on this important system.

100 More Equipments for the Interborough

3/1/24

The 100 two-motor GE-260 Equipments with PC-10 double-end Control recently ordered for the Subway Division of the Interborough Rapid Transit Company are duplicates of 398 Equipments which have been in service since 1917.

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

11-3

GE-260 Motor

PC-10 Controller

C-131 Master Controller

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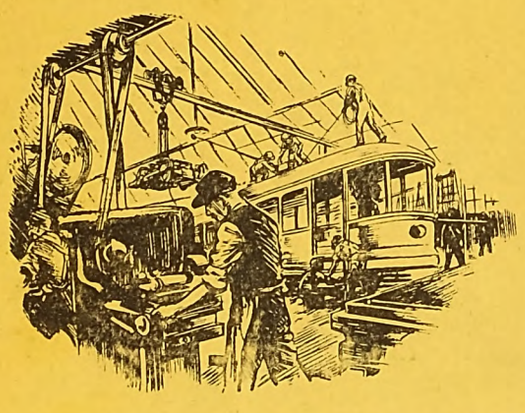
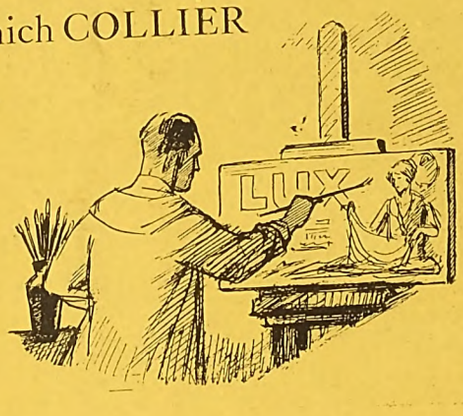
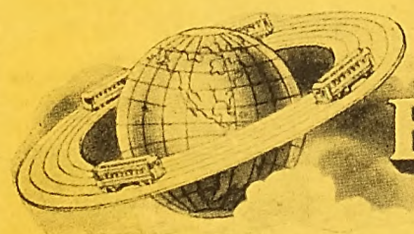


JUST as it has taken years of faithful adherence to ideals of service to build and maintain the street car lines—so has it taken years of faithful study and application to build into Car Card Advertising the value which COLLIER SERVICE has created.





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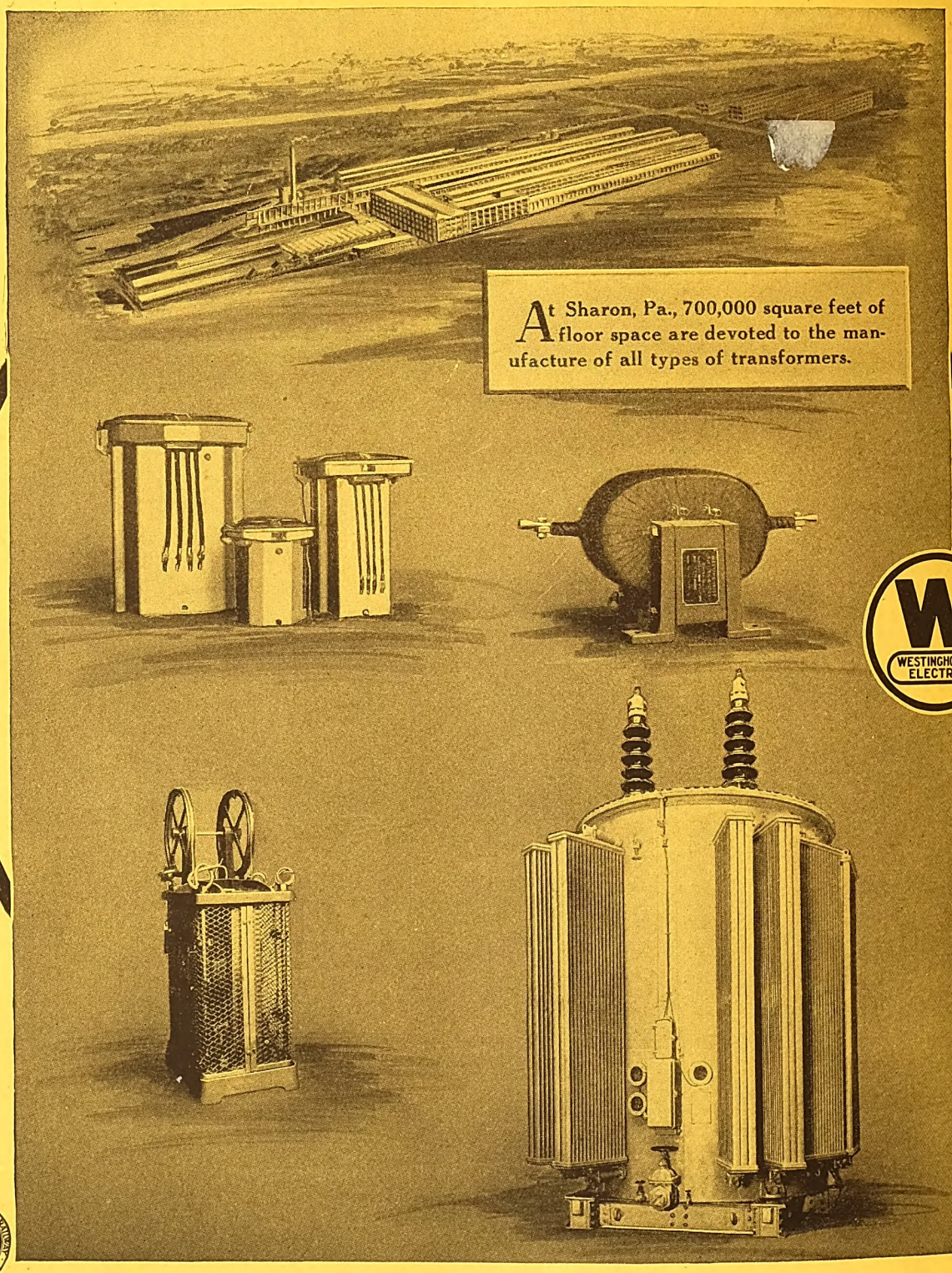
The New Westinghouse Transformer Works



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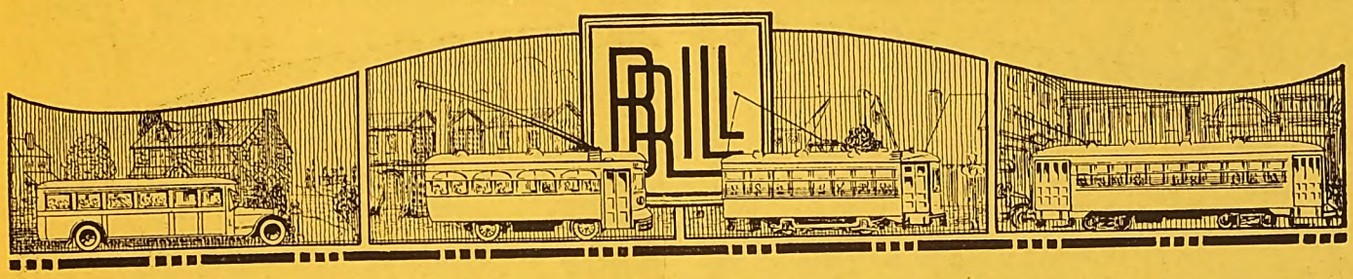

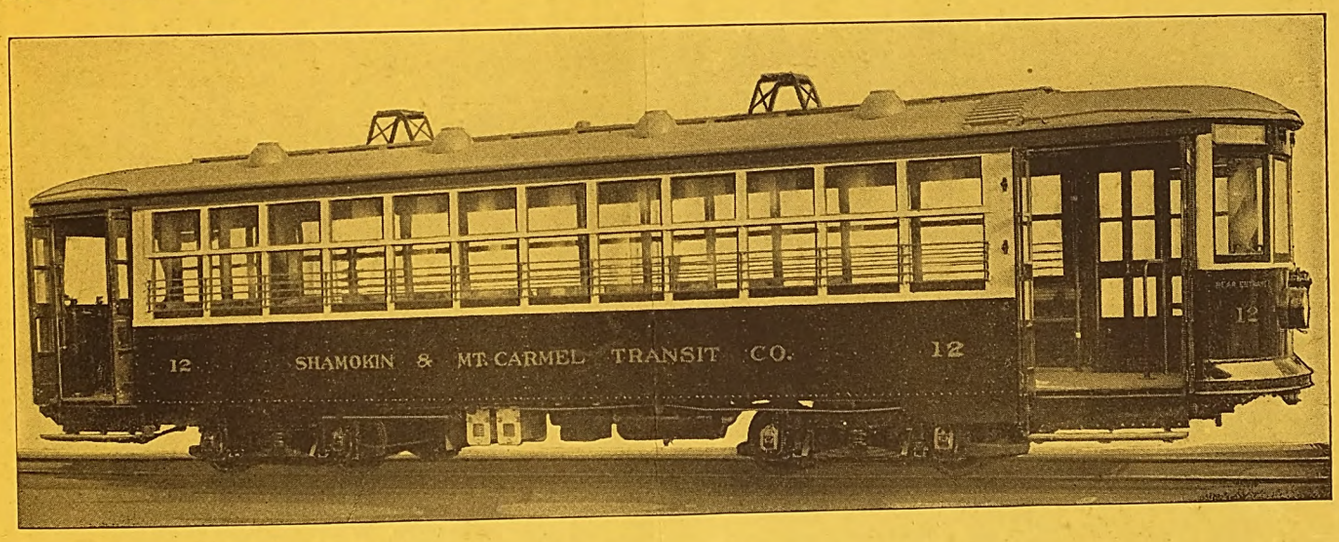

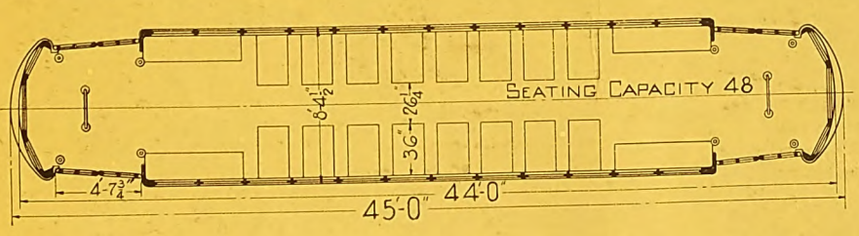

Brill 77-E-1 Low-level Trucks
Twin Swing Links

Shamokin & Mt. Carmel Transit Co.'s

Light-Weight Double-end Cars

The latest equipment to be placed in service by this company on its nine-mile route between Shamokin and Mt. Carmel comprised seven modern type cars built in our Philadelphia Plant.

Under these cars the Brill No. 77-E-1 low-level type trucks are equipped with Brill Twin Swing Links which retain the smooth and steady riding action of this popular Brill truck on uneven track and under higher rates of speed.

Complete weight on trucks, and including quadruple 35 Hp. motor equipment, is 35,786 lbs.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.
AMERICAN CAR CO. ST. LOUIS MO. — G. C. KUHLMAN CAR CO. CLEVELAND, OHIO. — WASON MANF'G CO. SPRINGFIELD, MASS.

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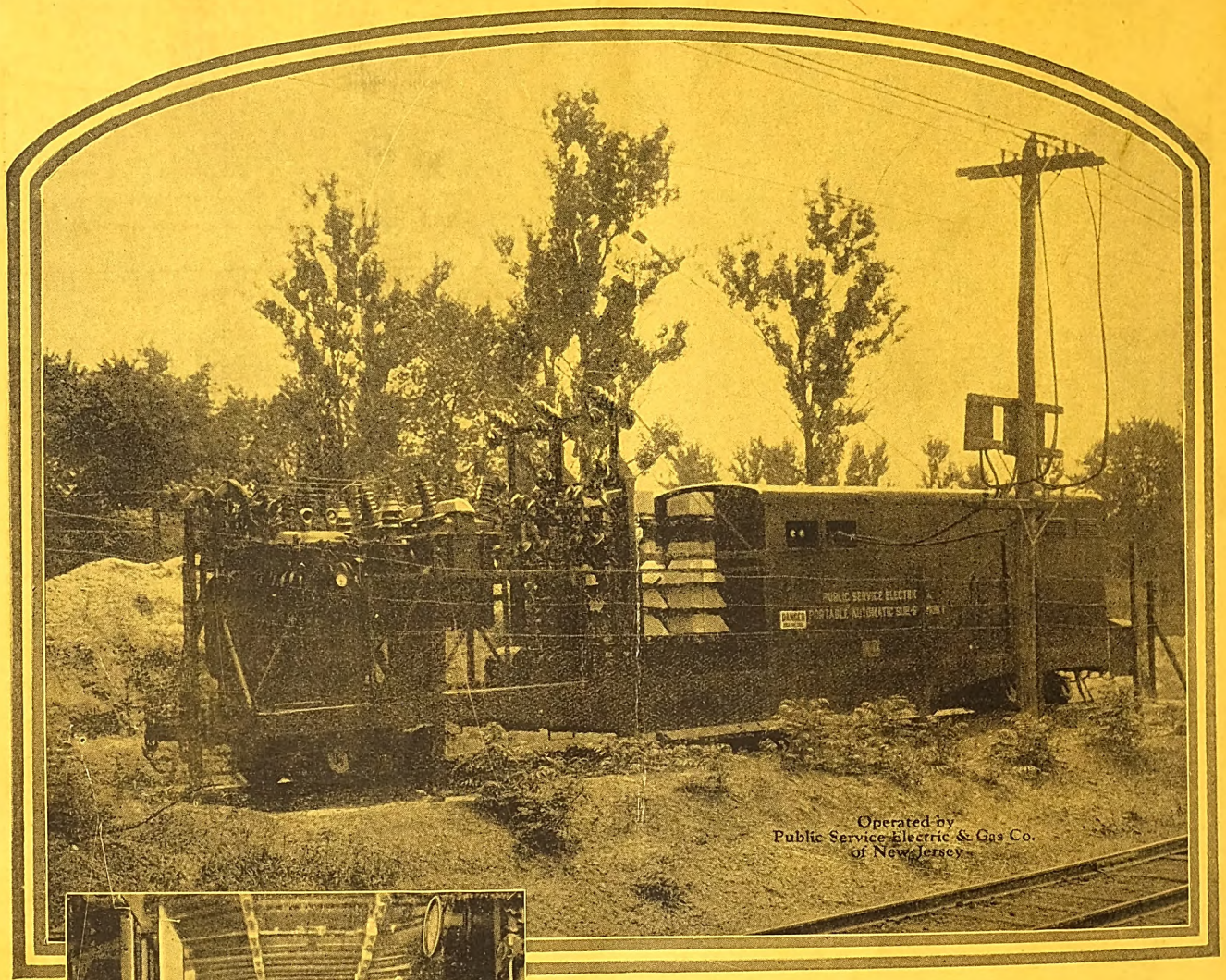

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—an ideal substation for emergency operation.

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This portable automatic substation was built and equipped, complete, by the General Electric Company.

4-4

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